



80th Anniversary
Suan Sunandha Rajabhat University



Program

The 80th Anniversary of Suan Sunandha Rajabhat University

“International Conference on Innovation, Smart Culture and Well-Being”

(ICISW2018)

November 8th, 2018 at Suan Sunandha Rajabhat University, Bangkok, Thailand



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Suan Sunandha Rajabhat University



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Preface

Suan Sunandha Rajabhat University collaborates with the research network under the participation of other cohosts from leading educational institutions inside and outside the country, as well as fifteen public and private research institutions including Swinburne University of Technology from Australia, Universiti Putra Malaysia and Universiti Teknologi MARA (UiTM) Kedah from Malaysia, Wenzao Ursuline University and Tatung University from Taiwan, Kent State University from United States, Tianjin University of Traditional Chinese Medicine from China, Vinh Long Community College from Vietnam, Science and Technology Education Centres (STECs) from UNESCO, as well as National Research Council of Thailand, Bansomdejchaopraya Rajabhat University, Phranakhon Rajabhat University, Chandrakasem Rajabhat University, Dhonburi Rajabhat University, Pranakhon Si Ayutthaya Rajabhat University from Thailand in order to hold the international academic conference of 80th anniversary of Suan Sunandha Rajabhat University establishment regarding “International Conference on Innovation, Smart Culture and Well-Being”. This conference is aimed to be a channel in internationally spreading research studies as well as creative works, and to entail the consideration from academics in emphasizing research studies, disseminating the research studies into a wider academic conferences, creating a collaborative research network with the international educational institutions and research institutions as well as publicizing research studies and creative works at the international level.

On behalf of this international academic conference committee, we would like to acknowledge the contributions from all contributors comprising of lecturers, qualified committees, cohosts from both inside and outside the university, presenters, attendees, authorities and staffs who participate in supporting this international academic conference to be well accomplished and correspond to all achievements. Finally, we hope that the knowledge and experiences from this international academic conference will benefit to academic fields, communities, societies as well as the country in the future.

Assistant Professor Dr. Suwaree Yordchim
Chairman of the International Academic Conference Committee

The 80th Anniversary Suan Sunandha Rajabhat University (SSRU)
“International Conference on Innovation, Smart Culture and Well-Being”
(ICISW2018) November 8th, 2018 Bangkok, Thailand

ICISW2018 aims to provide unique opportunity for the academicians and researchers to present their finding and SHARE their ideas with global leaders. One of the important targets of the conference will be to create networking opportunities for future collaborations between participants.

ICISW2018 will be held at Suan Sunandha Rajabhat University, Bangkok, Thailand on 8th November 2018.

Interested and prospective authors are invited to submit their abstracts and full papers (oral presentations) via Email to *conference2018@ssru.ac.th* (for more information please visit conference website:

<http://conference.ssru.ac.th/icisw2018>).

Tel: 02-160-1341

Topics:

1. Education and Learning Management
2. Humanities and Social Sciences
3. Business Administration, Economics and Management
4. Arts and Designs
5. Science and Technology
6. Medical and Health Sciences
7. Nursing and Health Promotion

Publications:

The conference would offer a large number of invited lectures from renowned speakers all over the country. The best paper awards will be given for the papers judged to make the most significant contribution to the conference. All the accepted papers will be published in “Conference Proceeding Online”. Selected papers will be published in official open-access journals: The Journals are listed in Thailand Citation Index (TCI) and ASEAN Citation Index (ACI).

Important dates:

Deadline for Abstract Submission:	15 th September 2018
Registration:	16 th October 2018
Deadline for Full Paper Submission:	16 th October 2018
Conference Date:	8 th November 2018
Deadline for Camera Ready Paper Submission:	15 th November 2018
Public Proceeding Online:	30 th November 2018

Suan Sunandha Rajabhat University

From the Royal Park to Thailand's number 1 Rajabhat University - Suan Sunandha was once the royal garden, surrounded by varieties of flowers in the precinct of Dusit Palace, for leisure of King Rama V and the royal family. The name "Uttanyan Sunandha" or "Sunandha Royal Garden" was dubbed from name of Indra God's garden in the paradise, and was also the name of King Rama V's most beloved queen – Queen Sunandha Kumareerattana. The 32 buildings within Suan Sunandha were built in the Reign of King Rama VI for being the residence of the royal consorts and concubines of King Rama V, including the courtiers. The most grandeur building belonged to one of the royal consorts, Her Highness Princess Saisavali Bhiromya, who later founded a school for girls named "Nibhakarn", aimed at training the royal etiquette and manner for young royal ladies as well as ladies from noble families.

The Siamese revolution of 1932 made a big impact towards the royal households. A lot of royal members and courtiers resided in Suan Sunadha felt unsecure about the situation; consequently, they left the place. The beauty and splendid of Suan Sunandha, including Nibhakarn School no longer existed. It was until the reign of King Rama VIII, the once-decayed Suan Sunandha was back to life.

In 1937, the cabinet had made a consensus to make use of Suan Sunadha space as a school for girls named "Sunandha Wittayalai School", offering a teaching certificate.

In 1975, the Ministry of Education raised the status of the school to become a higher education institution according to 1975 Teacher Education Act under the name "Suan Sunadha Teacher's College", offering three levels of education – higher education, secondary education and elementary education (the latter two were known as demonstration school or lab school.)

The 14th of February 1992 was a remarkable day of 36 teacher colleges nationwide since King Rama IX, the late King Bhumibhol, had graciously granted the name "RAJABHAT INSTITUTE" (Rajabhat means people of the king) to all colleges and Suan Sunadha Teacher's College became known as Suan Sunandha Rajabhat Institute.

In 2004, the "RAJABHAT UNIVERSITY" act was endorsed. Since then, Suan Sunandha has become Suan Sunandha Rajabhat University, the Archetype University for the Society of the present days.

Rationale

Suan Sunandha Rajabhat University is recognized the importance of research which can create new knowledge to develop research, teaching, and research institutions and applied research by encouraging and supporting the creation of the research staff of the University as well as general educational personnel to produce research that is valuable to society as well as encourage the dissemination of research results that are beneficial to the public that contributes to bringing research results to benefit academically and to further the development of commercial or industrial use.

The importance of such research and development, the management of **The 80th Anniversary of Suan Sunandha Rajabhat University (SSRU) “International Conference on Innovation, Smart Culture and Well-Beings”** as a platform to exchange experiences and knowledge, where faculty and students in all fields, which are Humanities and Social Sciences, Science and Technology, Health Science for education and economics groups and administration, which will contribute to raising the quality of the research.

Call for Papers

ICISW2018 aims to provide unique opportunity for the academicians and researchers to present their finding and **SHARE** their ideas with global leaders. One of the important targets of the conference will be to create networking opportunities for future collaborations between participants.

Topics:

1. Education and Learning Management
2. Humanities and Social Sciences
3. Business Administration, Economics and Management
4. Arts and Designs
5. Science and Technology
6. Medical and Health Sciences
7. Nursing and Health Promotion

For instructions to authors and further information, please visit our website at: www.ird.ssru.ac.th or contact the Editor Asst. Prof. Dr. Suwatee Yordchim at: conference2018@ssru.ac.th

Topic

1. Education and learning management
2. Humanities and social sciences
 - 2.1 Humanities
 - 2.2 Social sciences
3. Business administration, Economics and management
 - 3.1 Business management
 - 3.2 Economy
 - 3.3 Management
 - 3.4 Marketing
 - 3.5 Human resource management
 - 3.6 Human capital management
 - 3.7 Accounting
 - 3.8 Finance and banking
 - 3.9 International business
 - 3.10 Business computer
 - 3.11 Communication arts
 - 3.12 Logistics
 - 3.13 Quality management
 - 3.14 Innovation management
4. Arts and designs
 - 4.1 Painting music and performing arts
 - 4.2 Product design, Art design
 - 4.3 Architectural design
5. Science and technology
 - 5.1 Physical sciences
 - 5.2 Biological science
 - 5.3 Computer science
 - 5.4 Food and nutrition
 - 5.5 Engineering
 - 5.6 Environment and energy
 - 5.7 Mathematics and statistics
6. Medical science and health science
7. Nursing and health promotion

Editorial Board & Committee

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Education and learning management

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Humanities and social sciences management

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Science and technology management

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Peer review

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Nursing and health promotion management

- | | |
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Education and learning management

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Science and technology management

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(ICISW2018)

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 Email: conference2018@ssru.ac.th



Program

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8th November 2018
Suan Sunandha Rajabhat University, Bangkok, Thailand

11.00 – 12.30

REGISTRATION & LUNCH

1. Sri Chuthapha building, Graduate School 3 Floor and 4 Floor
Room 2141, 2143, 2144, 2146, 2147, 2148, 2132, 2136
2. Faculty of Sciences and Technology 1 Floor Room 26109

OPENING CEREMONY

12.30

Guests to be seated in Sunandhanusorn Hall
SSRU Video Presentation

13.00 - 13.20

Arrival of Mr. Korn Dabbarangsi
Chairman of University Council
Reported by Asst. Prof. Dr. Suwaree Yordchim
Director of Institute for Research and Development
Opening Address of Mr. Korn Dabbaransi

13.20

Keynote speaker: Research for Sustainable Development Goals
By Mom Luang Panadda Diskul

14.00 – 17.00

CONFERENCE SESSIONS

BUILDING 1: Sri Chuthapha building, Graduate School

1. Education and learning management Room 2141, 2143
2. Humanities and social sciences management Room 2144
3. Business administration, Economics Room 2146
and management
4. Arts and designs management Room 2147, 2148
6. Medical science and health science management Room 2132
7. Nursing and health promotion management Room 2136



Program

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BUILDING 2: Faculty of Sciences and Technology

5. Science and technology management

- | | |
|---|------------|
| - Biological Science, Food and Nutrition | Room 26502 |
| - Computer Science, Environment and Energy | Room 26503 |
| - Engineering, Physical Sciences, Chemistry | Room 26504 |



The 80th Anniversary of Suan Sunandha Rajabhat University (SSRU)
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8th November 2018

Room No. 2141, Sri Chuthapha building, Graduate School

Theme : Education and learning management

Chairman : Prof.Dr. Raweewan Shinatrakool

Co-Chairman : Asst.Prof.Dr. Wichain Intarasompun

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_12	The Construction and Development of Problem-based Learning using Problem-Solving Project by Active Learning Method through Social Cloud to Develop Problem-Solving Skills of Students in Education Faculty before Practicing Professional Experience	Chaiwat Jewpanich	Suan Sunandha Rajabhat University	
2	14.15 – 14.30	ICISW2018_ O_13	The Development of Activity Learning Kit Combined With Application Kahoot for the Development of English Communication Skills of Prathom Suksa 1 Students of Suan Sunandha Rajabhat University Demonstration School	Butsirin Jewpanich	Suan Sunandha Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
3	14.30 – 14.45	ICISW2018_ O_14	Factors Associated with Community Health Nursing Practicum Achievement of Nursing Students at College of Nursing and Health, Suan Sunandha Rajabhat University	Kanit Ngowsiri	Suan Sunandha Rajabhat University	
4	14.45 – 15.00	ICISW2018_ O_16	The Need For Further Study In Bachelor Of Business Administration In International Logistics Management Program Of The Students In Eastern Thailand	Wissawa Aunyawong	Suan Sunandha Rajabhat University	
5	15.00 – 15.15	ICISW2018_ O_20	A Study Problems Conditions of Internships of students' in Mathematics	Tanawat Srisirawat	Suan Sunandha Rajabhat University	
6	15.15 – 15.30	ICISW2018_ O_138	Reconsidering teacher education with humanistic Clinical Pedagogy	Prof. Dr. Ted yuchung Liu,	Department of Education, National Pingtung University	



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Room No. 2143, Sri Chuthapha building, Graduate School

Theme : Education and learning management

Chairman : Dr.Thada Siththada

Co-Chairman : Dr.Somchai Shinatrakool

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_117	Schools In Multilingual South Thailand And Their Role In In Forging Patani Malay Nationalism	Pakkamol Siriwat	Cambridge University	
2	14.15 – 14.30	ICISW2018_ O_52	The Supervisory Model Of Efl Pre-Service Teachers, Suan Sunandha Rajabhat University	Wipada Prasansaph	Suan Sunandha Rajabhat University	
3	14.30 – 14.45	ICISW2018_ O_63	Title : Development of creative thinking in art education by using the worksheet of Grade 6	Pawinee Sorawech	Suan Sunandha Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
4	14.45 – 15.00	ICISW2018_ O_72	A Development of an Instructional Model Based_on Model of the Development of the Teachers' Competencies for Thailand 4.0 for Student Teachers, Suan Dusit University	Thip Khumyoo	Suan Dusit University	
5	15.00 – 15.15	ICISW2018_ O_133	A study of ability of critical thinking "life and environment" by adopting integrated learning method with grade 9 students	Monmanut Sutsin	Suan Sunandha Rajabhat University	
6	15.15 – 15.30	ICISW2018_ O_123	Linguistic Repertoire and Language Attitudes of Thai Soeng Dam Ban Talat Khwaaj, Chom Bueng District, Ratchaburi Province	Puncharee Sornsrisom	Suan Sunandha Rajabhat University	



The 80th Anniversary of Suan Sunandha Rajabhat University (SSRU)
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Room No. 2144, Sri Chuthapha building, Graduate School

Theme : Humanities and social sciences management

Chairman : Assoc.Prof.Dr.Yothin Sawangdee

Co-Chairman : Asst.Dr.Prof.Kirk Person

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_109	Perceptions of Pre-marital Sex and Co-habitation Among Young People in Malaysia	Gul Muhammad Baloch	Taylor's University, Malaysia	
2	14.15 – 14.30	ICISW2018_ O_103	Female Student Experience In A Male-Dominated Aviation Program	Gui Lohmann	Griffith University, Australia	
3	14.30 – 14.45	ICISW2018_ O_24	Development of Educational Exhibition Design In the last two decades (1997-2018)	Tapone Nimsawaeng	Suan Sunandha Rajabhat University	
4	14.45 – 15.00	ICISW2018_ O_26	Exposure to Information and Image of Suan Sunandha Rajabhat University in the Attitude of Student	Sawitree Suvanno	Suan Sunandha Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
5	15.00 – 15.15	ICISW2018_ O_27	The persistence and public relations approach for students to the College's students, innovation and management. Suan Sunandha Rajabhat University	Pachoke Lert-Asavapatra	Suan Sunandha Rajabhat University	
6	15.15 – 15.30	ICISW2018_ O_64	Study of Senior Tourist Behavior in NakhonPathom Province	Supaksiri Prakanchaen	Suan Sunandha Rajabhat University	
7	15.30 – 15.45	ICISW2018_ O_70	Emo Myth: 10-Year Follow Up of Emo Teens in 2000s	Proud Arunrangsiewed	Suan Sunandha Rajabhat University	
8	15.45 – 16.00	ICISW2018_ O_83	The Participation Herb Garden Development on Ubiquitous Learning of Plan Genetic Conservation Under the Initiation of Her Royal Highness Princess	Kalaya Yotcamlue	Loei Rajabhat University	
9	16.00 – 16.15	ICISW2018_ O_108	Metacognitive Strategy Preference in vocabulary learning among Thai EFL learners at Nakhonratchasima Rajabhat University	Supitchaya Wongkumsai	Nakhon Ratchasima Rajabhat University	
10	16.15 – 16.30	ICISW2018_ O_137	English Phrasal Verbs from a Film Script "Titanic"	Hatsaya Matiko	Suan Sunandha Rajabhat University	



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8th November 2018

Room No. 2146, Sri Chuthapha building, Graduate School

Theme : Business administration, Economics and management

Chairman : Asst.Prof.Dr.Raweevan Proyrungroj

Co-Chairman : Dr.Denis Sergeevich Ushakov

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_61	Desirable Properties Of Accountants Scholarship Of Establishments In The Province Of Trat	Rungrasmee Deeprasai	Rajamangala University of Technology Tawan- ok Chantaburi Campus	
2	14.15 – 14.30	ICISW2018_ O_69	International Schools: A Fountainhead Of Future International Business Managers?	Christopher Richardson	Graduate School of Business, Universiti Sains Malaysia	
3	14.30 – 14.45	ICISW2018_ O_97	Strategic Human Resource Management In Enhancing Talent Management For Logistics Organizations: Resource-Based View Perspective	Prashanth Beleya	University Sains Malaysia	

No.	Time	ID	Title	Researcher	Affiliation	Note.
4	14.45 – 15.00	ICISW2018_ O_7	Factors of effects to Thai Financial Reporting Standards for SMEs in business	Apinya Wisessing	Suan Sunandha Rajabhat University	
5	15.00 – 15.15	ICISW2018_ O_33	The Influencing Factors of Online Purchased Decision Behavior: Case Study in Dusit, Bangkok.	Yalada Pornprasert	Suan Sunandha Rajabhat University	
6	15.15 – 15.30	ICISW2018_ O_19	Improve the Process of Service with Lean Concept: A Case Study of Salaya Hospital	Martusorn Khaengkhan	Suan Sunandha Rajabhat University	
7	15.30 – 15.45	ICISW2018_ O_25	Improvement the Process of Service with Lean Conceptual: A Case Study of Ranong Hospital	Niyom Suwandej	Suan Sunandha Rajabhat University	
8	15.45 – 16.00	ICISW2018_ O_57	The Effects of Off-balance Sheet Financing Types and Directional Preference on Investors' Perceived Credibility in Financial Reporting	Huda Wongyim	Suan Sunandha Rajabhat University	
9	16.00 – 16.15	ICISW2018_ O_78	Culture and implementation of e-tax invoice in Thailand: Evidence from companies in the stock exchange of Thailand	Satha Waroonkun	Maejo University	
10	16.15 – 16.30	ICISW2018_ O_86	Antecedents and Consequences of Passion among Teachers: A Dualistic Model of Passion	Chakrit Srisakun	International Centre of Excellence - Dusit Thani College	
11	16.30 – 16.45	ICISW2018_ O_104	Factors enhancing the effectiveness of smart hypermarket	Nalinee Sophatsathit	Suan Sunandha Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
12	16.45 – 17.00	ICISW2018_ O_120	Cultural Community-Based Tourism: A Case Study Of Ngao Community, Mueang District, Ranong Province, Thailand	Phanitthat Pungpakdee	Suan Sunandha Rajabhat University	
13	17.00 – 17.15	ICISW2018_ O_126	The evaluation of International Freight Forwarders Selection Criteria Shipper in Thailand	Salisa Hemmapan	Suan Sunandha Rajabhat University	
14	17.15 – 17.30	ICISW2018_ O_127	Relationship Of Marketing Activities And Sustainable Coffee Product Of Community Enterprises In Ranong Province	Ratirath Na Songkhla	Suan Sunandha Rajabhat University	
15	17.30 – 17.45	ICISW2018_ O_134	Dip Slide Technique to monitor the water quality of Cooling Tower in Air Conditioning System to the Building	Piti Anontapant	Suan Sunandha Rajabhat University	



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Room No. 2147, Sri Chuthapha building, Graduate School

Theme : Arts and designs management

Chairman : Assoc.Prof.Dr.Raja Ahmad Azmeer Raja Ahmad Effendi

Co-Chairman : Dr.Mohammad Yazah Mat Raschid

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_111	The Role of Emotional Intelligence in Sustainable Transportation Design	Andi Nursyuhada Abdul Kadi	UPM	
2	14.15 – 14.30	ICISW2018_ O_112	Entrepreneurial ideas catalyst for Graduates careers through international collaboration	Azhari Bin Md Hashim	Malaysia	
3	14.30 – 14.45	ICISW2018_ O_125	“In Family We Trust” : The Role and Status of Women in Thai-Chinese Families	Chong Lee Yow	University Malaysia Sarawak	
4	14.45 – 15.00	ICISW2018_ O_128	The Phenomenon of Blusukan Strategy with ANIMATION AVATAR Concept In 2018 Political Campaign of West Java Governor, Indonesian. (A Case Study : Mr Ridwan kamil and Mr Uu Ruzhanuk Ulum As Candidate Election)	Dermawan Syamsuddin	Bina Nusantara University, Jakarta, Indonesia	

No.	Time	ID	Title	Researcher	Affiliation	Note.
5	15.00 – 15.15	ICISW2018_ O_124	Documentary film “ My story is... ” Doi Bo Highland Agricultural Development Station Under the Royal Initiative Project of the Her Majesty Queen Sirikit	Eakapotch Dhanasiri	Suan Sunandha Rajabhat University	
6	15.15 – 15.30	ICISW2018_ O_129	Narrative Structure in Films Directed By Sophon Sakdaphisit	Asiah Sarji	Suan Sunandha Rajabhat University	
7	15.30 – 15.45	ICISW2018_ O_130	Aesthetics In Sofia Coppola’s Films	Azlina Binti Asaari	Suan Sunandha Rajabhat University	
8	15.45 – 16.00	ICISW2018_ O_131	Cinematography in Wes Anderson’s Films	Lonzia Maurice Berry	Suan Sunandha Rajabhat University	



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Room No. 2148, Sri Chuthapha building, Graduate School

Theme : Arts and designs management

Chairman : Assoc.Prof.Jeffrey Marc Rockland

Co-Chairman : Dr.Phakamas Jirajarupat

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_74	“An Interdisciplinary and Collaborative Research: Art, Theatre, History, Culture and Music”	Yuko Kurahashi	Kent State University	
2	14.15 – 14.30	ICISW2018_ O_75	Sustainable Development in Performing Arts	Jakyung Seo	Kent State University	
3	14.30 – 14.45	ICISW2018_ O_76	Sustainability in the Performing Arts.	Eric van baars	Kent State University	
4	14.45 – 15.00	ICISW2018_ O_77	The Collaborative Process, Practices, Exploration And Its Sustainable Education In The Performing Arts	Suwatana Rockland	Kent State University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
5	15.00 – 15.15	ICISW2018_ O_79	The Importance of Personal Narrative for Sustainable Education in the Performing Arts	Jeffrey Marc Rockland	Kent State University	
6	15.15 – 15.30	ICISW2018_ O_37	Evaluation of the Thai national fonts: using the empirical approach	Farida Virunhaphol	Suan Sunandha Rajabhat University	
7	15.30 – 15.45	ICISW2018_ O_71	Recontextualisation as adaptation technique to re-create the bleak ending for Agatha Christie's And then there were none	Nataporn Rattanachaiwong	Suan Sunandha Rajabhat University	
8	15.45 – 16.00	ICISW2018_ O_85	The Creation of Knew Nah Mah'costume	Whutthichai Khathawi	Suan Sunandha Rajabhat University	
9	16.00 – 16.15	ICISW2018_ O_110	The Transformation of Puppet Show in Central Thailand to Northeastern Part : A Case Study of the Rodsirinilsil and Petchnongrue Troupes.	Phattaranan Phooyathip	Suan Sunandha Rajabhat University	



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Room No. 26502, Faculty of Science and Technology

Theme : Biological Science, Food and Nutrition

Chairman : Dr.Dong Thanh Ha

Co-Chairman : Dr.Mohammad Bagher Javadi

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_100	Plantlet Production from Shoot tip Explants of Aquatic Plant, <i>Cryptocoryne walkerii</i> cultured In vitro	Suphat Rittirat	Nakhon Si Thammarat Rajabhat University	
2	14.15 – 14.30	ICISW2018_ O_101	Large Scale in vitro Propagation of <i>Anthurium andraeanum</i> cv. HC 028 for Commercial Application	Suphat Rittirat	Nakhon Si Thammarat Rajabhat University	
3	14.30 – 14.45	ICISW2018_ O_106	In Vitro Propagation of an endangered medicinal Plant, Bat flower; <i>Tacca chancieri</i> Andre. for Conservation in Thailand	Suphat Rittirat	Nakhon Si Thammarat Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
4	14.45 – 15.00	ICISW2018_ O_90	Effect Of Surface Roughness On The Adhesion Of Escherichia Coli In Stainless Steel Surface	Tuangthong Chotchutiphong	King Mongkut's University	
5	15.00 – 15.15	ICISW2018_ O_59	Changes in Lipids of Boiled Dried Anchovy (<i>Stolephorus heterolobus</i>) during Practical Industrial Drying	Chatchawan Chotimarkorn	Prince of Songkla University	
6	15.15 – 15.30	ICISW2018_ O_45	An Analysis of Efficiency of Hand Wash Gel Mixed With the <i>Carissa carandas</i> L. Fruit Extract Against Pathogenic Bacteria	Chantana Kankamol	Suan Sunandha Rajabhat University	
7	15.30 – 15.45	ICISW2018_ O_87	Local Food Recipes For Health In Pa-Sao Community By Community Participation	Kantida Chaima	Uttaradit Rajabhat University	



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Room No. 26503, Faculty of Science and Technology

Theme : Computer Science, Environment and Energy

Chairman : Asst.Prof.Dr.Tatsanawalai Utarasakul

Co-Chairman : Prof.Dr.Bulent Cavas

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_73	Decision Support System Development For Avoiding Obesity	Suwimon Kooptiwoot	Suan Sunandha Rajabhat University	
2	14.15 – 14.30	ICISW2018_ O_82	Waste Separation Behavior	Suwimon Kooptiwoot	Suan Sunandha Rajabhat University	
3	14.30 – 14.45	ICISW2018_ O_80	The Analysis of Water Quality for Water Supply System in Bannongvang village, Namon District, Kalasin, Thailand	Ploypilin Charin	Kalasin University	
4	14.45 – 15.00	ICISW2018_ O_6	Expert system to diagnose the risk of depression in the elderly	Nisanart Tachpetpaiboon	Suan Sunandha Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
5	15.00 – 15.15	ICISW2018_ O_50	Building Envelope Design With Passive Technique To Improve Energy Efficiency In School Building	Jitravadee Roongin Kunkar	Suan Sunandha Rajabhat University	
6	15.15 – 15.30	ICISW2018_ O_135	Developing Core Mathematical Skills In Rich Ict Environment For The Foundation Of Young Human Resource In A Prosperous Knowledge Economy	Tran Vui	Hue University of Education	
7	15.30 – 15.45	ICISW2018_ O_136	Inquiry Based Science Education And Responsible Research And Innovation: Real Examples From European Union Projects	Bulent Cavas	Dokuz Eylul University	



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Room No. 26504, Faculty of Science and Technology

Theme : Engineering, Physical Sciences, Chemistry

Chairman : Prof.Takashi Kaneta

Co-Chairman : Assoc.Prof. Dr.Naveen Kumar Perumalla

Asst.Prof.Dr.Wanida Wonsawat

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_91	Investigation Into Laser Surface Modification Of Stainless Steel	Pornnarin Kaewsaard	King Mongkut's University of Technology Thonburi	
2	14.15 – 14.30	ICISW2018_ O_118	The Development of Cyber Laboratory Instruction Model under the Theory of Constructivism	Ammara Ittipongse	Suan Sunandha Rajabhat	
3	14.30 – 14.45	ICISW2018_ O_119	The Flipped Classroom in Physics1 of 1st Year Students in Applied Physics	Wichan Lertlo	Suan Sunandha Rajabhat University	
4	14.45 – 15.00	ICISW2018_ O_43	The Efficiency of Interactive Science Simulations-Based Physics Teaching	Thanat Krobthong	Suan Sunandha Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
5	15.00 – 15.15	ICISW2018_ O_93	Estimation of GNSS Receiver Bias Using Fitted Receiver Bias Method	Naveen Kumar Perumalla	Okayama University	
6	15.15 – 15.30	ICISW2018_ O_121	Paper-Based Analytical Devices for On-Site Chemical Analyses	Takashi Kaneta	Okayama University	
7	15.30 – 15.45	ICISW2018_ O_89	Design of Broadband and Low profile Microstrip Patch Antenna using Strip Slot Hybrid Structure	Ramakrishna Dasari	Osmania University, India	



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Room No. 2132, Sri Chuthapha building, Graduate School

Theme : Medical science and health science management

Chairman : Prof.Zhong Qiang Wei

Co-Chairman : Assoc.Prof.Dr.Duangporn Nacapunchai

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_66	TCM in Preventive Treatment of Diseases: Constructing a New Medical Model	Zhong Qiangwei	Tianjin University of Traditional Chinese Medicine	
2	14.15 – 14.30	ICISW2018_ O_67	Coherence in Logic of the First Paragraph in the Analects	Yu Yan	Huaqiao University	
3	14.30 – 14.45	ICISW2018_ O_68	Women’s preferences and factors influences the obstetric services among rural population of Sindh, Pakistan	Ramesh Kumar	Health Services Academy	
4	14.45 – 15.00	ICISW2018_ O_17	Effectiveness of Elderly Caregiver Training Programs	Tipvarin Benjanirat	Suan Sunandha Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
5	15.00 – 15.15	ICISW2018_ O_36	Effects of Learning Stroke of Population Group at Risk in Samutsongkram Province	Supparas Oatsawaphonthanaphat	Suan Sunandha Rajabhat University	
6	15.15 – 15.30	ICISW2018_ O_84	Cadmium And Lead Contaminated In Fish Collected From Markets In Thailand And Health Risk Assessment	Prisna Pianjing	Suan Sunandha Rajabhat University	
7	15.30 – 15.45	ICISW2018_ O_95	Factors associated with violence behavior of adolescents in Changwat Udon Thani	Jeerapa Panyakumphol	Suan Sunandha Rajabhat University	
8	15.45 – 16.00	ICISW2018_ O_98	Development Of Hair Cream Of Coconut Oil Virgin	Narin Kakatum	Suan Sunandha Rajabhat University	
9	16.00 – 16.15	ICISW2018_ O_99	Summary of 1 2 3 Cases of Breast Cancer From Professor Jia Yingjie's Therapeutic Drugs	Mukda Tosaeng	Suan Sunandha Rajabhat University	
10	16.15 – 16.30	ICISW2018_ O_102	Cannabis In Thai Menopausal Woman	Pongsak Jaroengarmsamer	Suan Sunandha Rajabhat University	
11	16.35 – 16.45	ICISW2018_ O_105	Research and Development of Bureau of Parliamentary Medical Service, The Secretariat of the House of Representatives	Sirilick Jittrabeab	Suan Sunandha Rajabhat University	
12	16.45 – 17.00	ICISW2018_ O_107	Utilization of herbal fermented water to maintain the health of the Thailand community	Phatphong Kamoldilok	Suan Sunandha Rajabhat University	
13	17.00 – 17.15	ICISW2018_ O_132	Successes and failures in Rabies Elimination stories in Thailand	Thavatchai Kamoltham	Suan Sunandha Rajabhat University	



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Room No. 2136, Sri Chuthapha building, Graduate School

Theme : Nursing and health promotion management

Chairman : Assoc.Prof.Dr. Soh Kim Lam

Co-Chairman : Assoc.Prof. Tipapan Sungkapong

No.	Time	ID	Title	Researcher	Affiliation	Note.
1	14.00 – 14.15	ICISW2018_ O_31	Opinions of Undergraduate Nursing Students on Their Community Health Nursing Experiences : School Placements	Chotisiri, L, Sonsanam	Lecturer Suan Sunandha Rajabhat University	
2	14.15 – 14.30	ICISW2018_ O_8	Effective of self help group to stress with mental health promotion behaviors of elderly, Bangnanglee,AmphawaDistrict,Samutsongkham Province	Wachiraporn Chotipanut	Lecturer Suan Sunandha Rajabhat University	
3	14.30 – 14.35	ICISW2018_ O_48	The Results of Play Activities for Caregivers Towards Early Childhood Developmental Promotion	Sumala Sawangjit	Lecturer Suan Sunandha Rajabhat University	

No.	Time	ID	Title	Researcher	Affiliation	Note.
4	14.35 – 14.45	ICISW2018_ O_139	Nursing Perspectives on Dengue Prevention	Kim Lam Soh, Niazlin	Universiti Putra Malaysia	
5	14.45 – 15.00	ICISW2018_ O_140	Knowledge of Hand, Foot and Mouth Disease (HFMD) among Parents at Paediatric Clinic in A Public Hospital, Selangor	Salimah Japar, Nor Syaza	Universiti Putra Malaysia	
6	15.00 – 15.15	ICISW2018_ O_141	Maternal stress in a neonatal intensive care unit (NICU) – A survey	Swee Leong Ong; Khatijah	Universiti Sultan Zainal Abidin	
7	15.15 – 15.30	ICISW2018_ O_142	How Physically Active Are Malaysian Nursing Students	Kim Geok Soh, Kim Lam	Universiti Putra Malaysia, Serdang, Selangor	
8	15.30 – 15.35	ICISW2018_ O_60	Relationship between Running in the Morning and Related Factor Effect on Sleeping in Elderly	Kwanrutai Sampoon	Suan Sunandha Rajabhat University	
9	15.35 – 16.00	ICISW2018_ O_39	Health Promotion and perceive the knowledge and health promotion behaviors to the pregnant women at Antenatal clinic at Phranangklao hospital	Phakaphon Taewrob	Suan Sunandha Rajabhat University	
10	16.00 – 16.15	ICISW2018_ O_143	The Study Nursing Practice in Labor Room versus Stress among Nursing Students	Juthamard Wongngao	Suan Sunandha Rajabhat University	
11	16.15 – 16.30	ICISW2018_ O_144	Quality of Life of the Older Adult in the Senior Citizen Center of Nonthaburi Municipality, Nonthaburi Province	Mantana Sukre	Suan Sunandha Rajabhat University	
12	16.30 – 16.45	ICISW2018_ O_145	The Study of Stress toward Dietary Patterns of Nursing Students	Sirintra Sriboonrat	Suan Sunandha Rajabhat University	



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13	The Development of Activity Learning Kit Combined With Application Kahoot for the Development of English Communication Skills of Prathom Suksa 1 Students of Suan Sunandha Rajabhat University Demonstration School		Education and learning management	Butsirin Jewpanich	8
14	The Development of Activity Learning Kit Combined With Application Kahoot for the Development of English Communication Skills of Prathom Suksa 1 Students of Suan Sunandha Rajabhat University Demonstration School		Education and learning management	Kanit Ngowsiri	16
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117	Preliminary Findings on Educational Choices of Language Loyalty and Belonging among Nayu Youths		Education and learning management	Pakkamol Siriwat	59
123	The Study of Linguistic Repertoire and Language Attitudes of Thai Soeng Dam Ban Talat Khwaaj, ChomBueng District, Ratchaburi Province		Education and learning management	Puncharee Sornsrisom, Suwaree Yordchim, Kirk Person, Cholthicha Sudmuk, Behrad Aghaei	72
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103	Female Student Experience in a Male-Dominated Aviation Program		Humanities and social sciences management	Gui Lohmann	125
108	Metacognitive Strategy Preference in Vocabulary Learning among Thai EFL Learners at Nakhonratchasima Rajabhat University		Humanities and social sciences management	Supitchaya Wongkumsai, Prapit Phutthishart	139
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37	Evaluation of Thai National Fonts: Using the Empirical Approach		Arts and designs management	Farida Virunhaphol, Chantana Insra, Nawaporn Srisarankullawong, Marut Pichetvi, Kreetha Thumcharoensathit, Peerapol Chatchawan	247



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The Construction and Development of Problem-Based Learning using Problem-Solving Project by Active Learning Method through Social Cloud to Develop Problem-Solving Skills of Students in Education Faculty before Practicing Professional Experience

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ABSTRACT

The objectives of this study were: 1. To construct the problem-based learning using the problem-solving project by active learning method through Social Cloud to develop the problem-solving skills of the students in the Education Faculty before practicing the professional experience, 2. To find the quality value of the problem-based learning format by using the problem-solving project with active learning method through Social Cloud to develop the problem-solving skills of the students in the Education Faculty before practicing professional experience.

The sampling group consisted of five teacher representatives from the Faculty of Education in Suan Sunandha Rajabhat University. The purposive sampling method was used to determine the sampling group who were teachers in the Faculty of Education of Suan Sunandha Rajabhat University using the evaluation form, the form of the input factor consistency, the assessment step appropriateness, the problem-solving skill appropriateness, and the feedback appropriateness.

From the study results, it was found that the problem-based learning format by using the problem-solving project with active learning method through Social Cloud to develop problem-solving skills of the students in the Education Faculty before practicing professional experience had the following evaluation results: the input factor consistency level was evaluated the highest at the total mean score of 5.00, and the evaluation result was at the similar levels with the Standard Deviation value at 0.00. The evaluation appropriateness result had the highest level with the total average score of 4.80, and it had the evaluation result at the similar level with the Standard Deviation value of 0.45. In addition, feedback had the highest appropriateness level with the total mean score of 5.00 and the Standard Deviation value of 0.00. Therefore, the learning format that had been developed had the most appropriate level in quality.

Keywords: *Learning format, Problem-based learning format, Problem-solving skill*

INTRODUCTION

According to the National Education Act of 2542 Chapter 4 on the education management guideline and Chapter 9 on the technology for education, it was the law factor which was very essential towards the learning development with the support of more technology as follows: (the National Education Commission Office, 2542)

The self-learning in the present has various supporting technologies which depend upon the viewpoints of instructors or the supporters of teaching of how to apply those technologies for the advantages which have to gain the most benefits under the present resource circumstance. The author is a teacher in the Faculty of Education of Suan Sunandha Rajabhat University. He has the obligation on supervising the Education Faculty students who have to practice the professional experience. At the time during his supervision work, he found that the student trainees had lacking problem-solving skills which were the important skills of the twenty-first century. Therefore, the



researcher managed to study the strategy of the learning management in order to use it in developing the Education Faculty students to possess the increasing problem-solving skills by applying the national policy emphasizing the concept of Thai education 4.0. From the study, it was found that a new innovation had to be constructed following the learning gained from the project. Subsequently, the researcher analyzed the context and found that before the students of the Education Faculty started the project, they had to be aware of the problems. In this study, it focused on the learning problems which the students practicing the professional experience had to construct the innovation for the solution. In addition, from the study, it was found that the active learning method was the learning format that stimulated the learning of the learners, and the participation in class would result in obtaining the sustainable knowledge. In addition, in the present circumstance, technology was very progressive that the societies on cloud known as Social Cloud occurred. Consequently, the researcher foresaw the benefit of using technology in the design of the learning format. Therefore, the researcher had the idea to study on the design of the problem-based learning format using the problem-solving project with active learning method through Social Cloud to develop the problem-solving skills of Education Faculty students before practicing the professional experience.

LITERATURE AND THEORY

The learner must learn from the problem. Knowledge of problem solving is systematic, based on the knowledge that the learner needs to investigate the cause of the problem in order to solve the problem, and prevent it from happening again.

Systems and procedures

Project Management Learning Management is the development of students. Think of teamwork as a systematic task.

Active Learning is a learning process that emphasizes the learner's ability to learn.

Cloud Computing is a new generation of information technology. I do not know what the location is as it can be accessed anywhere and anytime by connecting to the internet. Users can specify requirements for cloud computing software.

The solution is a good process, expertise in problem solving, analytical thinking, planning, implementation, and conclusions (Chaiwat Jewpanich, 2018).

RELATED WORKS OR DISCUSSION

1.1 Hypothesis

The designed learning format would be certified by the experts at a higher level.

1.2 Study Scope

The population was 60 teachers of the Education Faculty in Suan Sunandha Rajabhat University.

The sampling group consisted of five teacher representatives from the Education Faculty in Suan Sunandha Rajabhat University.

METHODS

There are five topics as following.

1. Input Factor Consistency
2. The Assessment Stage Appropriateness
3. The Problem-Solving Skill Appropriateness



4. The Feedback Appropriateness

The five teachers in the Faculty of Education with a specific selection are regarded as a specialist in the form of learning management research.

RESULT

Research Result

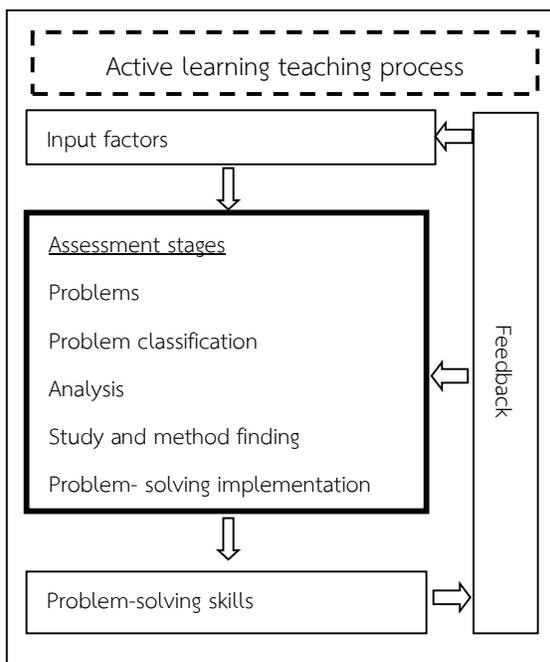


Illustration 1. The problem-based learning format using the problem-solving project with the teaching method through Social Cloud in order to develop the problem-solving skills of the Education Faculty students before practicing the professional experience

Table 1
Input Factor Consistency

No.	List	\bar{X}	S.D.	Result
1	Learning environment	5.00	0.00	The highest
2	Learning materials	5.00	0.00	The highest
3	Computer	5.00	0.00	The highest
4	Internet signal	5.00	0.00	The highest
5	Audio equipment	5.00	0.00	The highest
Total Average		5.00	0.00	The highest

From the result of the input factor consistency, it had the highest level with the average score of 5.00 with the evaluation result of similar level to the standard deviation value of 0.00.



Table 2
The Assessment Stage Appropriateness

No.	List	— X	S.D.	Result
1	Problem	4.80	0.45	The highest
2	Problem classification	4.80	0.45	The highest
3	Problem analysis	4.80	0.45	The highest
4	Study and method finding	4.80	0.45	The highest
5	Problem solving implementation	4.80	0.45	The highest
Total Average		4.80	0.45	The highest

From the result of the assessment stage appropriateness, it had the highest appropriateness level with the average score of 4.80 with the similar evaluation result to the standard deviation value of 0.45.

Table 3
The Problem-Solving Skill Appropriateness

No.	List	— X	S.D.	Result
1	Problem-solving skills	4.80	0.45	The highest
Total Average		4.80	0.45	The highest

From the result of the problem-solving skill appropriateness, it was found that the problem-solving consistency had the highest and clearest level with the total average of 4.0 with the standard deviation value of 0.45.

Table 4
The Feedback Appropriateness

No.	List	— X	S.D.	Result
1	Feedback	5.00	0.00	The highest
Total Average		5.00	0.00	The highest

From the feedback result, it was found that the appropriateness level was at the highest with the total average score of 5.00 with the standard deviation value of 0.00.

CONCLUSION AND FUTURE WORK

Conclusion

The result of the construction and problem-based learning format development using the problem-solving project with the active learning method through Social Cloud to develop the problem-solving skills of the Education Faculty students before practicing the professional experience were presented as well as discussed as following:

1.1 On the construction and the development of the problem-based learning format by using the problem-solving project with the active learning method through Social Cloud to develop the problem-solving skills of the Education Faculty students before practicing the professional experience, from different concepts and theories by studying from related documents together with the content analysis of the lessons from the curriculum, the



determination of the behavioral objectives in planning the construction and development with the help of the content experts whose opinions on the consistency index between the question issues and the evaluation forms had led to the learning formats. It found the following process which contained the roles of teachers as the evaluators:

- Learning environment
- Learning materials
- Computer
- Internet signal
- Audio equipment

Subsequently, the learning process started from the problem finding. In other words, the learners had to meet the problem, or the teacher brought the problem to the learners, so they could learn how to classify the problem. The learners had to work in group to see which problem was essential or which problem was not necessary. Moreover, the learners had to identify the thing which was thought to be a problem but in fact, it was not a problem. They had to be able to delete what was not the real problem. They had to meet in group through Line group to conduct analysis and find the solution. It was the step for each learner to research for the information that was most similar to the problem, bring the data to discuss with the group through the Line group, work for the problem-solving implementation, and arrive at the conclusion. Things had to be done systematically. What they got was the problem-solving skills of the learners.

On the aspect of feedback, it could be examined that the mistakes were firstly from the input factors which corresponded to the research work of Jewpanich and Piriya-Surawong (2015). According to Jewpanich and Piriya-Surawong, the project-learning format with the discussions and lesson finding through the online social media in order to develop the problem-solving skills of the Education students at the graduate level which consisted of four components including (1) the analysis of input factor readiness (Input), (2) the project-learning process with the method of discussion and lesson finding through online social media (Process), (3) the learning achievement and problem-solving skill assessment result (Output), and (4) the evaluation value between the process and feedback (Evaluate & Feedback). Subsequently, the result of the study revealed that assessment result of the project-learning format with discussions and lesson finding through the online social media to develop the problem-solving skills of the Education graduate students had the quality value at the highest level of appropriateness.

1.2 For the quality value finding of the construction and development of the problem-based learning format by using the problem-solving project with active learning method through Social Cloud to develop the problem-solving skills for the Education Faculty students before practicing the profession experience, the overall picture of all the formats had a high level of quality value due to the fact that every evaluation topic obtained high levels as following:

The input factor consistency value had the highest level with the total average score of 5.00 with the assessment at the similar level of the standard deviation value of 0.00.

The assessment appropriateness was at the highest level with the total average score of 4.80, and had the similar assessment value to the standard deviation value of 0.45.

For the problem-solving skill appropriateness, it was found that the problem-solving consistency and clearness had the highest level with the total average score of 4.0 with the standard deviation value of 0.45.

For feedback appropriateness, it had the highest level with the total average score of 5.00 with the standard deviation value of 0.00.

This corresponded with Patcharee Srisung (2008) who studied on the development of the learning management format on Social Psychology by using community and experiment-based study in order to enhance the characteristics of the desired graduates. The study was on the development of the learning management format which had the development process. The research was an operational research in the form of mutual knowledge creation as a three-



cyclic cycle. From the study, it was found that for the intelligence aspect, it had the average score at a good level. On the aspect of emotion and feeling, the average score was high, and on the skill aspect, the average score of every skill was at a high level except the observation skill that received the highest score which was higher than that before using the learning management format when compared. Before using the learning management format, the average score on intelligence aspect was at the update level. The average score on the emotion and feeling was at a moderate level, and the average score on the aspect of all skills was at a low score except for the observation skill which received a fair score. The difference was at a significance level of .05. In addition, Chatchawan Buarikan (2016) studied on the learning management using CIPPA model on permutation for 11th grade students. The study results revealed that the skill on arithmetic problem-solving of 11th grade students after the learning management using CIPPA model on permutation was significantly at a higher level than criteria at 75 percent and at the significance level of .05. Moreover, Jewpanich and Waree (2011) studied on the development of the online lesson construction training curriculum using LMS Moodle for the readiness preparation for practicing the professional experience of the second year students of the Education Faculty in Suan Sunandha Rajabhat University. From the research result, it was found that the ability in the online lesson construction using LMS Moodle for the readiness preparation for practicing the professional experience was higher after the training than that before the training at the statistical significant level of .01. Subsequently, the satisfaction of the students towards the online lesson construction training curriculum using LMS Moodle for the readiness preparation for practicing the professional experience of the second year students of the Education Faculty in Suan Sunandha Rajabhat University in the overall picture was at the highest. In addition, Benjamas Promsila (2012) stated that the learning process using ADDIE Model consisted of 5 steps including the evaluation of demand and the analysis, the designing, the development, the trial, and the assessment in order to maintain the state as the set objectives. Accordingly, there was also an assessment and the back and forth examination among the processes which were paralleled to the learning format that had been developed for the objective to arouse the effective learning. In addition, it corresponded to Nattakarn Parkrote (2014) on the topic of the development on the learning format focusing on interactions by the technology that was like real according to the principle of education entertainment to develop the emotional intelligence. From the study result by five experts on the assessment to give certification to the learning format focusing on interactions by the technology that was like real according to the principle of education entertainment to develop the emotional intelligence, it was certified that the learning format had the highest score in appropriateness.

Future Work

From the research study, the author had the following suggestions:

1. It would be an example showing the development of other learning formats in the future.
2. It should be developed and improved to correspond to the situations in the present and in the future.



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The Development of Activity Learning Kit Combined With Application Kahoot for the Development of English Communication Skills of Prathom Suksa 1 Students of Suan Sunandha Rajabhat University Demonstration School

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ABSTRACT

The study aimed to develop the Activity Learning kit combined with the application Kahoot for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School. The sampling group consisted of 50 students who were determined by the purposive sampling method from the students of Suan Sunandha Rajabhat University Demonstration School. The sampling group was from the classroom that the author was the subject’s teacher responsible for the English subject. The tools used in the study were the Activity Learning kit combined with the application Kahoot for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School. The achievement test and the data analysis involved the efficiency level finding of the lessons on website according to the determined criteria which was 83.67/86.53. The achievement comparative study was between the pre-learning and post-learning of the lessons on website analyzed by t-test which resulted in the value of 53.93 with the statistical significance level of .05.

From the research result, it was found that the Activity Learning kit combined with the application Kahoot for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School had the efficiency value of 83.67/ 86.53 which was above the set criteria of 80/80. The learning achievement was higher with the t value of 53.93. Moreover, it could be used as guidance in the development of the Activity Learning management in other subjects in the future.

Keywords: *Activity kit, Kahoot application, English communication skills*

INTRODUCTION

The direction of the country development was planned according to the strategy called Thailand 4.0. After considering its details, it was found that the master plan consisting of supporting plans was the plan of the Ministry of Education called Thai Education 4.0. After considering the details from the documents as well as the seminars of different stages, it was found that at the present time, the education has been focusing on the construction of innovations and the creation of learning projects which had to concern the interaction process with the students, and the students had to participate and enjoy the learning activities which were called active learning. This corresponded with the National Education Act of 2542 Chapter 4 on the education management guidelines, the National Education Act Chapter 9 on the technology for education which was the law on education enforcing those people in education association to realize and follow it creatively (Government Gazette, 2542)

Presently there is a development on a variety of learning tools, and the program called Kahoot is the popular one among the various tools. Kahoot is found effective towards the learning due to the fact that it entertains students.



Moreover, it consists of interactions in the learning which motivated the students to open their minds in learning.

Suan Sunandha Rajabhat University Demonstration School (Prathom) is the learning place subsidiary to Suan Sunandha Rajabhat University. Its main function is to offer the teaching in primary level as well as the compulsory education in order to build the knowledge base for the students to improve onto the higher education. However, in conducting the teaching of the teachers, they have to confront many obstacles in learning. The researcher teaches English in Prathom Suksa 1. Therefore, the researcher has acknowledged the essential problems one which is the lack of the English communication skills.

From the above reasons, the researcher has determined to conduct a study on the development of the Activity Learning kit combined with the application Kahoot for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School with the hope that it would benefit the students as well as the school in the future.

LITERATURE AND THEORY

Kahoot application is a computer system tool which can be accessed using the internet to create interesting games for learning today. It is very popular among educators in technology and education.

Using the criteria to find the effectiveness of the web-based lesson, and apply the results of the assessment of the difference of grades from the previous exam and post-practice exam. After the training, the learners scored higher than before the training. The t-test (Dependent Sample) (Butsirin Jewpanich, 2018)

RELATED WORKS OR DISCUSSION

Objectives of the study

To develop the Activity Learning kit combined with the application Kahoot for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School.

Study Scope

Population: 418 students of Suan Sunandha Rajabhat University Demonstration School (Prathom)

Sampling group: 50 students of Prathom Suksa 1 from Suan Sunandha Rajabhat University Demonstration School

METHODS

1. Creation and development of learning activities along with the use of Kahoot application to improve the English communication skills of Prathom Suksa 1 students.

2. Pre-test - Multiple choices consisted of 20 items. The analysis of data, when the test was finished, it was brought to 5 experts to evaluate the quality. The results of this study were presented in the following sections.

3.1. To improve the English communication skills of Prathom Suksa 1 students. At the highest level, the average score was 4.93 and the result was similar with S.D. value of 0.15.

3.2. To improve the English communication skills of Prathom Suksa 1 students. Each lesson in the web-based tutorials was most appropriate at the overall level with the average score of 4.67, and the results were similar in level with the S.D. value of 0.48. Considering the details of each lesson, it was found that the second and third lesson was higher than the other lessons. The results showed that the average score was 4.80.

3.3. To develop English communication skills of Prathom Suksa 1 students. The results showed that the



content was clear at all stages. The average score is higher than the other. The highest score was 5.00.

3.4. To improve the English communication skills of Prathom Suksa 1 students. At the highest level, the mean score of 4.75 was at the highest level, and the scores were similar. The S.D. value was 0.42. The average score is higher than the other. The highest score was 5.00.

3.5. To improve the English communication skills of Prathom Suksa 1 students. The highest score was 5.00 and the result was similar with S.D. value of 0.00.

4. Development and efficiency, process performance (E1) on the efficiency of results (E2) of the performance of a series of activities together with the use of Kahoot application to improve the English communication skills of Prathom Suksa 1 students. $E1 / E2 = 83.67 / 86.53$. The efficiency of the process was 83.67%. Bristling percent after the test accounted for 86.53%.

RESULTS

Data Analysis Result

The Activity Learning kit combined with the Kahoot application for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School aimed to obtain the highest level of consistency.

The content in each section of the website lessons of the Activity Learning kit combined with the Kahoot application for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School aimed to obtain the highest level of appropriateness.

The content in the Activity Learning kit combined with the Kahoot application for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School aimed to obtain the highest level of consistency and clearness.

The language usage in the Activity Learning kit combined with the Kahoot application for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School aimed to obtain the highest level of correctness.

The Activity Learning kit combined with the Kahoot application for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School aimed to obtain the highest level of convenient application.

The process efficiency (E1) towards the result efficiency (E2) of the Activity Learning kit combined with the Kahoot application for the development of English communication skills of Prathom Suksa 1 students of Suan Sunandha Rajabhat University Demonstration School aimed to obtain the value of $E1 / E2 = 83.67 / 86.53$ with the value of E1 which was the process efficiency provided in the lesson with the value of 83.67 percent and the value of E2 which was the result efficiency with the value of 86.53 percent after post-test was done.



Table 1
Performance of the Activity Series with the Use of Kahoot application to Develop English Communication Skills of Prathomsuksa 1 Students of Rory Demonstration of Suan Sunandha Rajabhat University Aims to n = 50.

No.	Points Earned During Each Lesson (E ₁)			Total 30 Points	Percent	Test Score After School (E ₂)	
	1	2	3	30 Points	Percent	30 Points	Percent
1	9	8	8	24	80.00	24	80.00
2	8	8	8	27	90.00	27	90.00
3	9	9	9	24	80.00	24	80.00
4	8	8	8	25	83.33	25	83.33
5	9	8	8	25	83.33	25	83.33
6	9	8	8	24	80.00	24	80.00
7	8	8	8	27	90.00	27	90.00
8	9	9	9	24	80.00	25	83.33
9	8	8	8	25	83.33	25	83.33
10	9	8	8	24	80.00	24	80.00
11	8	8	8	27	90.00	27	90.00
12	9	9	9	24	80.00	24	80.00
No.	Points Earned During Each Lesson (E ₁)			Total 30 Points	Percent	Test Score After School (E ₂)	
	1	2	3	30 Points		1	2
13	8	8	8	25	83.33	25	83.33
14	9	8	8	25	83.33	26	86.67
15	9	8	8	25	83.33	26	86.67
16	8	8	8	24	80.00	25	83.33
17	9	9	9	27	90.00	28	93.33
18	8	8	8	24	80.00	25	83.33
19	9	8	8	25	83.33	28	93.33
20	8	8	8	24	80.00	28	93.33
21	9	9	9	27	90.00	28	93.33
22	8	8	8	24	80.00	25	83.33
28	9	8	8	25	83.33	25	83.33
29	8	8	8	24	80.00	27	90.00
30	9	9	9	27	90.00	27	90.00
31	8	8	8	24	80.00	25	83.33
32	8	8	8	24	80.00	26	86.67
33	9	9	9	27	90.00	27	90.00
34	8	8	8	24	80.00	24	80.00
35	9	9	9	27	90.00	27	90.00



36	8	8	8	24	80.00	25	83.33
37	9	9	9	27	90.00	27	90.00
38	8	8	8	24	80.00	24	80.00
39	9	9	9	27	90.00	27	90.00
40	8	8	8	24	80.00	24	80.00
41	8	8	8	24	80.00	25	83.33
42	8	8	8	24	80.00	25	83.33
43	9	9	9	27	90.00	27	90.00
44	8	8	8	24	80.00	25	83.33
45	9	9	9	27	90.00	28	93.33
46	8	8	8	24	80.00	25	83.33
47	9	9	9	27	90.00	27	90.00
48	8	8	8	24	80.00	28	93.33
49	9	9	9	27	90.00	29	96.67
50	8	8	8	24	80.00	28	93.33
Total				1255	4183	1298	4326.67
n = 50				Average 25.1	E ₁ = 83.67	Average 25.96	E ₂ = 86.53

From the table, the post-test score of the individual was higher than the pre-test score.

The scores before and after learning made by 50 students of the target group were analyzed by the t-test. It was found that the t-test value was 53.93 which was higher than the t value (t- table) that the value was 1.6766 with the level of statistical significance of .05. It could be concluded that the scores before and after learning were different. The score after learning had higher value than the score before learning. It meant that after the students had learned the lessons on website, the learning achievement of the students was higher than before learning. It could show that the lessons on the website could develop higher learning achievement of the students.

CONCLUSION AND FUTURE WORK

Table 2

Comparison of pre-test and post-test differences using t-test.

Evaluation	N	\bar{X}	$\sum D$	$\sum D^2$	t
Pre-Test	50	11.62	719	516916	53.93*
Post-Test	50	25.96			

* P statistically significant level. .05 , Df = 49

From Table 2, it showed the scores of target students before and after participated in the class. The table showed that the t-test score was 53.93. The t-test score was 1.6766 with the .05 level. Grades of the target students before



and after class were different. The scores of the target students were higher than before participated in the class. This means that after students learn with web-based tutorials achievement after school, students had higher scores than before. It showed the lessons on the web could develop student achievement higher.

Conclusion

Conclusion on the result of the development and the application of the lessons on website from the development and the usage of 418 students of Suan Sunandha Rajabhat Demonstration School (Prathom) showed that the sampling group consisted of 50 Prathom Suksa 1 students of Suan Sunandha Rajabhat Demonstration School, and the content used in the study from the core curriculum of the basic education in English subject of Prathom Suksa 1 of Suan Sunandha Rajabhat Demonstration School.

Variables in the study

The primary variable was the Activity Learning kit combined with the Kahoot application.
The secondary variable was the English communication skills.

1. The benefit anticipated to receive

It was anticipated to get an appropriate learning activities kit for the students of Prathom Suksa 1, Suan Sunandha Rajabhat University Demonstration School. The result discussions were as following:

1.1 The development and the application of the activity kit were completed, and it could reach the determined effectiveness because the author had studied well about the process to construct the activity kit from different concepts and theories of the related documents. Moreover, the author had conducted the analysis of the lesson content from the curriculum, determined the behavioral objectives for the planning and the development. In addition, the assistance on the aspect of content was received from the experts whose opinions were on the consistency index between the question issues, the objectives, and the learning standard of the curriculum. The tools used in the study were composed by the techniques in finding the accuracy value of tools and the finding of reliability value. Therefore, the construction of the activity kit could be successfully implemented. Besides, it could be applied and disseminated to other teachers of other schools. This corresponded to the research work of Wanwanutch Gungkuntod (2008). Gungkuntod (2008) conducted a research investigating the result of the application of the lessons on website combined with the integration of the inserted content on science subject about environment for 9th grade students. From the research result, the students’ learning achievement using the lessons on website combined with the teaching process of inserting content integration had the average score of 88.57 which passed the criteria that the school charter had determined. Eighty percent of the students could get scores more than 70 percent.

1.2 The efficiency value of the lessons on the website which was within the standard of the determined criteria of 83.67/86.53 was due to the fact that the researcher had studied the basic information. Accordingly, the researcher had analyzed the work, the content, the target learners as well as the behavioral objectives before bringing all the information for the planning of the construction and the development of the stated activity kit to reach the behavioral objectives with the guidance and suggestion from the experts on the content to examine for the accuracy of content, the correctness of language, the appropriateness of the learning method, and the presentation format designing. Subsequently, the lessons were brought to revise, improve, and develop. After that, these lessons on the website were brought for the trial with one group of a small number of students to find defects once more for the improvement and development before using them in the real experiment with 50 students. After the implement had been planned systematically with good steps, the lessons were applied on the sampling group of 50 students. From the experiment result, it was found that the efficiency value of the activity kit was 83.67/86.53 which was satisfactory



according to the set hypothesis. Moreover, the students’ learning achievement after learning was significantly higher than that before learning at the level of .05.

1.3 The students’ learning achievement after learning was higher than before learning was due to the fact that at the present situation there is a promotion for the teachers to use media in the teaching process to create motivation for the students to be enthusiastic to learn. Moreover, the teaching using the activity kit could respond well to the needs of the learners. It was not too complicated, and it could be used conveniently. It could reduce anxiety and fear especially the fear in learning at a high rate which caused the learners to learn with higher efficiency because the activity learning kit could make the students learn more effectively. This corresponded to the research result of Neungrutai Sopa (2006) who conducted the research on the designing and the finding of efficiency level of the lessons on website in order to review the subject of packaging design for the graduate students. From the research result, it was found that the stated lessons had the efficiency level of 82.64/80.07. It was above the criteria of 80/80 which had been set in the hypothesis. In addition, Chaiwat Jewpanich (2014) studied on the construction and development of the network lessons for the training project on the construction of network lessons for the teachers of the Ruam Pattana Wichacheep Kru School of Suan Sunandha Rajabhat University. From the research result, it was found that the efficiency level of the network lessons which was according to the determined criteria was 83.94/89.75. Moreover, the comparative study on the learning efficiency between before and after the training with the network lessons was analyzed by t-test with the result of 70.26 which had the statistical significance at the level of .05.

2. Discussions on the Distinctive Features of the Activity Kit

The distinctive features of the activity kit were as following:

2.1 For the distinctive features of the activity kit by the content analysis before doing the exercises and tests, it was found that it was completed according to the academic theory. Besides, the researcher has researched on different concepts and theories on the construction and development of the activity kit from the reliable sources both from the research papers and the information on websites. Therefore, the information was all up-to-date, and it was correct according to all the academic theories. In the part of the paper writing on the usage and the development, the researcher had done the work with consideration on the language principle as well as the logical content sequence of the topics that was determined in the curriculum. The report was written in the same system both the sequencing of topics according to the content and the reference system of the bibliography.

2.2 The researcher had prepared the report on the result of the development and the application of the activity kit through developing, improving and editing following the suggestions of experts together with the presentation in the research writing format of 5 chapters consisting of introduction, history and significance, related documents on concepts and research works, and research methodology as well as the implementation result on the development and the application.

2.3 On the use of concepts in building creativities, the researcher had studied different concepts and theories from well-informed persons with the opinions from specialists especially in educational technology. In addition, the researcher had participated in the training programs to accumulate experience. As a result, it could bring new knowledge. The application of computer technology in the learning process management for the students brought success to this innovation. Consequently, this innovation could facilitate a great advantage towards the education management. From the concept of this work creation, after bringing it to experiments, and publishing it to the public, it was appreciated and accepted among the teachers who were the users.

2.4 From the result after the use of the activity kit, 50 students received higher score. It showed that this learning media on website was effective, and it gave advantages to the learners. As a result, it could develop the learners to be able to gain a higher efficiency level.



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Future Work

From the research study, the researcher had the following suggestions:

1. It could be the example for other activity kit in the future.
2. There should be the development of other activity kits of other subjects in the future.

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Factors Associated with Community Health Nursing (CHN) Practicum Achievement of Nursing Students at the College of Nursing and Health, Suan Sunandha Rajabhat University

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ABSTRACT

This cross-sectional study aimed to examine the factors associated with Community Health Nursing (CHN) practicum achievement of the 4-year nursing students (n=105) at the College of Nursing and Health, Suan Sunandha Rajabhat University. Data were collected by using questionnaire, and were analyzed by means, standard deviation, percentiles, and Pearson correlation.

The research findings were presented as the following:

1. Mean score of the group companion was rated at the highest (4.41±0.66), followed by the instructor (4.37±0.64), and the practice area (4.21±0.67). Good relationship and collaboration in companion, and open-minded being were at the top three of all in mean score 4.46(0.64), 4.45(0.65), and 4.43(0.69).

2. Gender, age, parent’s marital status, student’s monthly income, health status, and grade point average (GPA) were not correlated toward CHN practicum achievement.

3. There was positive relationship between learning behavior; teaching patterns, and CHN practicum achievement (attitude, knowledge and skill) of nursing students (p< .01). In addition, the instructors and the practice areas were found positive relationship with attitude and knowledge (p< .01), but skill. And the group companion were found positive relationship with attitude and skill (p< .05), but knowledge.

According to the research findings, it can be applied as a guideline for learning and teaching management in order to improve the nursing students’ CHN practicum achievement.

Keywords: *Factor, Achievement, Nurse Student*

INTRODUCTION

Developing and strengthening nursing contributions to public and population health depends on quality and efficiency of the nursing curriculum administration that is very important to produce the effective graduated nurses. Responding to this objective, process of learning and teaching strategies in nursing institution should be evaluated and developed to increase nursing students’ achievement.

In baccalaureate nurse program, nursing students have to study nursing theories and practicum. They have to apply and integrate theoretical knowledge to provide nursing care in real situations before graduation. In order to increase the achievement of nursing students, students’ achievement must be continuously evaluated, and factors that affect learning must be identified as well.

For over a decade, the College of Nursing and Health, Suan Sunandha Rajabhat University in Bangkok, Thailand, has established, and produced graduated nurses about one thousand persons. There is Community Health Nursing (CHN) branch in the nursing program including the following compulsory subjects: health assessment and health promotion, community health nursing, epidemiology, and primary medical care for the second and the third year nursing students. Moreover, the fourth year nursing students have to learn the CHN practicum that provides training at an off-hospital, mainly in communities, public health center, and



school for 8 weeks. The CHN practicum program has integrated the knowledge, attitude, and skills that is an important part of the training for giving nursing student the opportunity to experience being the professional nurse. Therefore, the responsible person must provide the community-based experience for the nursing students according to the subject’s objective and enhance the achievement of the CHN practicum. In the College of Nursing and Health of Suan Sunandha Rajabhat University, the factors associated with the CHN practicum achievement have never been studied. The objective of this study was to examine the factors associated with CHN practicum achievement of the nursing students.

LITERATURE REVIEW

The previous studies showed that there were many factors related to academic achievement of nursing students, such as education management, learning behaviors of the nursing students in planing and attention to learn (Ponharn & Ruengworaboon, 2012; Thongsong & Pongsananurak, 2013; Lersthavomtham, Kitnopkiet &, Sawangwattanasait, 2014), teacher or instructor (Watthanasujja & Cheararom, 2011; Jennifer & Maria, 2011; Hongrahai & Uthsaha, 2012; Ponharn & Ruengworaboon, 2012; Anucha, 2015; Concepcio et al., 2016), friends and group companion (Thongsong & Pongsananurak, 2013), the average grade at high school (Khemapech ,2015), the cumulative GPA of nursing student (Ponharn & Ruengworaboon, 2012; Thongsong & Pongsananurak, 2013), as well as the patterns of teaching and learning activities (Jaritngam & Khontha, 2010; Watthanasujja & Cheararom, 2011; Anucha ,2015) . There were some studies showed that the attitude toward nursing profession, income of the student, achievement motivation (Jaritngam & Khontha, 2010), the family factors of the student such as marital status, and occupation and education of their parents had no relationship or uncleared relationship with academic achievement of nursing students (Likhitpongwit, 2010; Watthanasujja & Cheararom, 2011; Anucha, 2015). Most of the research studied in theoretical achievement of nursing students.

METHODS

Study design and Setting

This was a cross-sectional, descriptive study carried out between August 2017 and December 2017.

Participants

The study was conducted with 106 students of fourth year baccalaureate nurses from the College of Nursing and Health, Suan Sunandha Rajabhat University. They were divided into 10 groups which each group had 10-11 persons joining to practice CHN practicum (NUR4327) with the different instructors in different public health practicum areas in Bangkok within the same 8-week practicum program including community assessment, community diagnosis, community forum, students’ health assessment, community health and school health projects, home health care, group health education, and health care service in public health center.

Measures

Data were collected by using a questionnaire constructed from the review of relevant research papers. It composed of five parts including (1) general characteristics of the students including gender, age, parent marital status, monthly income, health status and grade point average (GPA), (2) the factors associated with CHN practicum achievement including 25 items consisted of learning behavior 5 items, group companion 5 items, teaching pattern 5 items, instructor 5 items, and practice area 5 items, (3) attitude toward CHN practicum consisted of 10 items, (4) knowledge of CHN practicum consisted of 23 items, and, (5) skill in CHN practicum consisted of 22 items. In part 2-5, each of the item was measured in a 5-point Liker scale ranged from strongly disagree to strongly agree. The questionnaires were distributed to the nursing students at the last day of CHN practicum which the nursing students took an average of 15-20 minutes to complete the questionnaires which were then returned to the data collector.



Data analysis

The statistical software package known as IBM SPSS for windows version 21 was used to perform all statistical analysis in this study. Descriptive statistics in terms of mean, standard deviation, and percentiles were performed for all parameters. Pearson correlation was conducted to examine correlations between general characteristic, learning behavior, group companion, teaching patterns, instructors, practice area, and CHN practicum achievement.

RESULTS

A total of 105 (out of a possible 106) nursing students completed the survey resulting in a rate of 99.1%. Participants’ average age was 21.8 (SD=0.63) which most of them were female (87.6%). The average income of the samples was 7,740.9 THB (SD=3,150.24). The average GPA of them was 3.10 (SD=0.29), and others are presented in Table 1.

Table 1
General characteristics of the sample (n =105)

	Data	n	%
Sex	Male	13	12.4
	Female	92	87.6
Age (year)	21	85	81.0
	22	14	13.3
	23	1	1.0
	25	5	4.8
		$\bar{X} = 21.8, SD=0.63$	
Marital status of parents	Married	85	81.0
	Divorced / Separated	14	13.2
	Widowed	6	5.8
Income/month (THB)	Up to 3,000	5	4.8
	3,001-5,000	23	21.9
	5,001-7,000	21	20.0
	7,001-9,000	26	24.8
	9,001- 10,000	24	22.9
	>10,000	6	5.7
		$\bar{X} = 7,540.9, SD=3,150.24$	
Health problem	None	98	93.3
	Present	7	6.7
GPA	≤ 2.5	1	1.0
	2.51-2.75	11	10.5
	2.76-3.00	26	24.8
	3.01-3.25	42	40.0
	3.26-3.50	16	15.2
	3.51-3.75	6	5.7
	≥3.76	3	2.9
		$\bar{X} = 3.10, SD=0.29$	

In evaluating the group of factors associated with CHN practicum achievement, the mean score of group companion was the highest (4.41±0.66) following by the instructor (4.37±0.64), the practice area



(4.21±0.67), and teaching pattern (4.16±0.66) while the lowest mean score was given for learning behavior of nursing student (3.94±0.64). The highest score of the item in each group was participated in group discussion and presentation (4.07±0.62) in the group of learning behavior of nursing student, good relationship (4.46±0.64) in the group of group companion, receiving the description of CHN practicum's objective (4.30±0.68) in the group of teaching pattern, giving student the opportunity to ask question and share idea (4.40±0.61) in the group of instructor, and appropriated staff for practice support (4.27±0.62) in the group of practice area (Table 2).

Table 2

Mean Score of Student Rating of Factors Associated with CHN Practicum Achievement
(n =105)

Factor	Construct	\bar{X}	SD
Learning behavior of nursing student			
1	Review CHN theories before practice	3.82	.73
2	Plan and prepare yourself for practice	3.85	.65
3	Search knowledge for operating job assignment	3.95	.61
4	Participate in group discussion and presentation	4.07	.62
5	Be responsible for task and group activity	4.03	.61
Total		3.94	.64
Group companion			
1	Good relationship	4.46	.64
2	Collaboration	4.45	.65
3	Share knowledge and discussion	4.37	.65
4	Listens attentively and respectfully to others	4.43	.69
5	Motivate and support in working group	4.33	.69
Total		4.41	.66
Teaching pattern			
1	Receive the description of CHN practicum's objective	4.30	.68
2	Daily pre-post conference	4.06	.72
3	Textbook and CHN manual in library	4.11	.66
4	Practicum management according to subject's objective	4.18	.63
5	Knowledge and experience sharing at the end of practicum	4.16	.64
Total		4.16	.66
Instructor			
1	Communication and teaching technique	4.34	.65
2	Give student the opportunity to ask question and share idea	4.40	.61
3	Encourage critical thinking among student	4.38	.64
4	Job assignment and monitoring	4.36	.64
5	Pre-post evaluation	4.39	.64
Total		4.37	.64
Practice area			
1	Orientation of public health center	4.21	.63
2	Appropriated staff for practice support	4.27	.62
3	Appropriated coordinator in practice area (community)	4.23	.68
4	Suitable community (safety, not far from students' home)	4.11	.73
5	Appropriated school for practice support	4.23	.68
Total		4.21	.67



The correlation of the general characteristics and CHN practicum achievement including attitude, knowledge and skill of the samples was shown in Table 3. Sex, age, parent’s marital status, student’s monthly income, health status and grade point average (GPA) were not correlated toward CHN practicum achievement.

Table 3
Correlation of the Characteristics and CHN Practicum Achievement (Attitude, Knowledge and Skill)

	Attitude		Knowledge		Skill	
	r	p-value	r	p-value	r	p-value
Sex	-.058	.558	-.129	.188	-.160	.102
Age	-.103	.296	-.055	.574	.134	.173
Parent’s marital status	-.011	.911	-.004	.971	.040	.684
Student’s monthly income	-.156	.111	-.014	.886	.122	.216
Health status	-.088	.374	-.011	.915	.087	.376
GPA	.091	.355	.042	.670	.084	.392

Table 4 showed the correlation of factors and CHN practicum achievement including attitude, knowledge and skill of the samples. There was positive relationship between learning behavior and CHN practicum achievement as following; attitude, knowledge, and skill of nursing students ($r=0.423, 0.327$ and $r=0.312, p<.01$). And also, in teaching patterns with attitude, knowledge, and skill of nursing students ($r=0.580, 0.339$ and $r=0.300, p<.01$). In addition, the instructors and the practice areas were found positive relationship with attitude ($r=0.531, 0.595, p<.01$) as well as positive relationship with knowledge ($r=0.357, .285, p<.01$). Accordingly, the group companion were found positive relationship with attitude and skill ($r=0.462, p<.01$ and $r=0.240, p<.05$).

Table 4
Correlation Matrix of the 5-Factors and CHN Practicum Achievement (Attitude, Knowledge and Skill)

	1.1	1.2	1.3	1.4	1.5	2.1	2.1	2.3
1. Factors								
1.1 Learning behavior of nursing student	1							
1.2 Group companion	.367**	1						
1.3 Teaching pattern	.540**	.553**	1					
1.4 Instructor	.327**	.479**	.615**	1				
1.5 Practice area	.568**	.592**	.683**	.614**	1			
2. CHN practicum achievement								
2.1 Attitude	.423**	.462**	.580**	.531**	.595**	1		
2.2 Knowledge	.327**	.183	.339**	.357**	.285**	.502**	1	
2.3 Skill	.312**	.240*	.300**	.189	.184	.390**	.641**	1

CONCLUSION AND FUTURE WORK

Nursing practicum is the important part of nursing preparation and nurses’ service for the public. Community Health Nursing (CHN) practicum is the subject that has been integrated various knowledge of nursing for giving nursing student the opportunity to experience and use knowledge and skill for the professional nurse. The current study showed the following factors; learning behavior of nursing student and teaching pattern correlated with CHN practicum achievement including attitude, knowledge and skill;



instructor and practice area correlated with attitude and knowledge; and group companion correlated with attitude and skill in CHN practicum of nursing students. According to the findings, it can be applied as a guideline for learning and teaching management of the CHN practicum in order to improve the nursing students’ CHN practicum achievement. Furthermore, qualitative study is recommended to identify in-depth understanding of each factor.

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The Need for Further Study in Bachelor of Business Administration in International Logistics Management Program of the Students in Eastern Thailand

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ABSTRACT

This research aimed to investigate the factors influencing eastern Thailand students' needs for further study in Bachelor of Business Administration (B.B.A.) International Logistics Management program. The sample groups of the study were selected by stratified random sampling method consisting of three hundreds twenty five 12th-grade students from seven provinces in eastern Thailand including Chonburi, Rayong, Chanthaburi, Trad, Chachoengsao, Prachinburi, and Sa Kaeo. The questionnaires were used to collect the data. The gathered data were analyzed by using frequency and percentage.

The results of the study showed that 55.5 percent of students were interested in the International Logistics Management program in B.B.A. . The influence factors on high school students' decision for further study in this program were as following: The reputation of the university was the highest influence factors. Other influence factors including the teaching and learning's efficiency of the program and personal reasons respectively. In addition, the respondents needed the offered program in the weekend, international conference scholarship, and high-tech logistics laboratory.

Keywords: *International Logistics Management, Further Study, 12th Grade Student*

1. INTRODUCTION

Due to International Logistics Management is interesting together with the economic development project in order to meet the needs of today students, the researcher wishes to know about the requirements for undergraduate students of International Logistics Management Program of students in Eastern Thailand, and to know the need for further study in the course. In order to be able to use the research results by education institutes, the lesson plans and learning process should be carried out in the future.

The objectives of this study are (1) to study the requirement of undergraduate students for B.B.A. International Logistics Management in Eastern Thailand, (2) to study the different attributes that affect the decision to study B.B.A. International Logistics Management in Eastern Thailand, and (3) to study the factors influencing students' decision making on B.B.A. (International Logistics Management) in Eastern Thailand.

2. LITERATURE & THEORY

2.1. Overview of International Logistics Management Study

Most International Logistics Management Majors are in the faculty of business administration, management, commerce and accountancy, management science, and many faculties. It is a dream major of high school students who study in the Arts or Math-Science. This major focuses on the graduate becoming the new International



Logistics Management, going forward with creative business. For the concept of International Logistics Management systematically, students in this field often have the opportunity to travel abroad. It is suitable for people who like to travel. The supporters will be academic researchers in International Logistics Management, import-export businessperson or consultants in International Logistics Management.

Students who graduate in International Logistics Management can work very wide because of the broad curriculum of this field. It mostly focuses on companies that are exporting or importing. Graduated students can work in many positions, such as marketing, coordination, foreign affairs or transportation of international transportation, or some people can work abroad as well. In import line - export Import-Export is mainly from the sales department, purchasing department, coordination department, and customs clearance procedures. For the work in this field, it is quite formal and elaborate that each product is very different. However, import - export, in each department may be redundant from other disciplines. For example, students who graduate in marketing can work in the sales department as well.

In the job application, most companies require applicants who have a bachelor degree without specific subject fields. In the International Logistics Management course, graduated students can choose various career paths in business administration including banking, finance, stock market, marketing, or sales representatives. For those who want to succeed in the job, they will need to continue studying at the master degree. This is the specialty of International Logistics Management. Most bachelor degrees will be based on business concepts, and maturity will be ready to develop in the field (College of Logistics and Supply Chain, 2018).

2.2 Decision Making to Further Study

Barnard (1938) stated that the decision making is an alternative consideration of many options to obtain the best alternative. Accordingly, Griffiths (1959) specified that decision is an alternative to practice by thinking about different choices. Additionally, Simon (1960) stated that decision making is a finding opportunities of decisions for the possible way. Pfiffner and Presthus (1960) indicated that decision making is choosing the best way to achieve the objectives as well as Oppenheim (1979) stated that making decision is a careful consideration before doing anything.

Schiffman and Kanuk (1994) identified that the decision making process is a process to choose from two alternatives. Accordingly, Plunkett and Attner (1994) summarized seven steps of decision making process as following: define the problem, identify limited factors, development potential alternatives, analyze the alternatives, select the best alternatives, implement the decision, and establish a control and evaluation system.

Kotler and Armstrong (2001) represented that there are four factors influencing decisive behavior as following: cultural factors, social factors, personal factors, and psychological factors.

2.3 Related Research

For related works in making decision, Cubillo, Sanchez, and Cervino (2006) proposed steps to make the decision of the foreign students comprising of five main factors including (1) reason and privacy, (2) impact on the image of the country, (3) the image of the city, (4) the image of the institution, and (5) the educational program. Chen and Simitat (2006) depicted that in Australia, the attitude or perceptions of Taiwanese students towards higher education in the destination country was the most important in shaping their intentions for overseas study. Additionally, the influence of family and friends was more important than consideration of resource necessary in shaping intentions to study in the USA. These differences provided a basis for considering tailored marketing plans for these countries.



3. METHODS

3.1 Population and Sample

For this study, the population was a total of 5186 students from 218 schools in the Eastern Thailand. From the result of stratified random sampling based on number of the districts, there were 62 schools selected as the representative of each district. Finally, from stratified random sampling based on the number of provinces, there were seven schools selected as the representative of each province.

The sample in the study was the students who were going to graduate in the 12th grade in Eastern Thailand. Thus, the sample size was calculated using the method adapted from Taro Yamane (1967). The 95% confidence interval was not more than 5% found to be 375. This randomly selected questionnaires according to their convenience. The sample size was proportional to the size of the population in each school.

3.2 Methods of study

3.2.1 Research Guidelines

There were many ways to deal with research that can be used to understand the relationship between knowledge and what is happening. In this case, this research was selected as a survey research. In order to understand the additional knowledge acquired from the attitudes of students who were going to study at the undergraduate level, exploratory research was applied because it was consistent with the nature of this topic. In the process of collecting data, it was based on theoretical ideas. There was a method of collecting survey data.

3.2.2 Research Plan

This research used structured approach. The sequence started with defining and describing related concepts, and created a conceptual framework for the research. The improved and developed conceptual framework for research was applied. The empirical data collected was comparative analyzed.

3.2.3 Research Instruments

The authors created research instruments step by step. The questionnaire used to collect data was created in the following order.

1. Study of the knowledge about undergraduate students in Bachelor of Business Administration majoring in International Logistics Management in Thailand as well as related research to be used in the questionnaire.
2. Scope of questionnaires was relevant to the needs of the undergraduate level in Bachelor of Business Administration Department of Logistics Management
3. The format of the questionnaire was divided into four sections as following: part 1 – general information of the respondents, part 2 - the survey of needs to study in Bachelor of Business Administration of International Logistics Management, part 3 – the survey of factors affecting students in Bachelor of Business Administration of International Logistics Management, and part 4 –Recommendations.
4. Test the quality of research tools. The researcher tested the accuracy of the questionnaire before using it to collect data from the sample.
5. Take the trial questionnaire to improve before the questionnaire was later distributed to the sample.

3.2.4 Data Collection

Researchers collected data manually by distributing the questionnaire to the sample. The researcher then collected the questionnaire and checked the completion as well as took the obtained information. The authors started by checking the validity of the questionnaire and coded in every question, then the data was processed by a computer program, and finally the results were analyzed.



3.3 Data Analysis

The data analysis of the questionnaire was completed by using SPSS for Window. Descriptive analysis of the following empirical data was carried out employing by Pearson Chi-Square Test.

Part 1 was demographic data of the respondents. Frequency and percentage value were used to qualify the sample.

Part 2 was information about the factors influencing to choose to study the Bachelor of Business Administration majoring in International Logistics Management of students in Eastern Thailand. The analysis was performed by using the mean and standard deviation.

Part 3 was information about the need to study the Bachelor of Business Administration majoring in International Logistics Management of students in Eastern Thailand. The analysis was performed by using the mean and standard deviation.

Part 4 was content analysis used to analyze information on comments and suggestions.

4. RESULT

The results of the research on the need for further study in Bachelor of Business Administration majoring in International Logistics Management program of the students in Eastern Thailand were as following.

Part 1 - the general information of the respondents was indicated that the respondents were 156 male students or 41.6 percent, and 219 female students or 58.4 percent. There were 235 students in Chonburi, accounted for 62.7 percent, 41 students in Rayong, accounted for 10.9 percent, 15 students in Chanthaburi, accounted for 4 percent, 19 students in Trad, accounted for 5.1 percent, 23 students in Chachoengsao, accounted for 6.1 percent, 19 students in Prachinburi, accounted for 5.1 percent, and 23 students in Srakaow, accounted for 6.1percent.

Part 2 - for the survey of needs to study in Bachelor of Business Administration International Logistics Management, the results showed that 55.5 percent of students were interested in the program in B.B.A. (International Logistics Management).

Part 3 - for the survey of factors affecting the selection of study in Bachelor of Business Administration International Logistics Management of the 12th grade students in the Eastern Thailand, it was found that most students agree that the educational factors especially the reputation was the most important. The average score was 4.21 followed by teaching and learning that the average was 3.75, and the personal reasons average score was 2.89 respectively. In addition, from the conclusion of the comments and suggestions in the questionnaire, it was found that the sample needed to study for the Bachelor of Business Administration. International Logistics Management was required to provide on-the-job training on Saturdays or Sundays, or on-the-job evening work on Mondays to Fridays. Support for research grants or scholarships, such as the cost of registration for academic papers or research articles. It also required logistics and supply labs for students with computer readiness and fast Internet access.

5. CONCLUSION

The research found that factors affecting the selection of graduate business administration curriculum. The International Logistics Management of twelfth grade students in the Eastern Thailand was ranked first in the field of education especially the reputation of the school followed by the teaching and learning, and personal reasons respectively. Moreover, results from qualitative survey, showed that this research were consistent with the research conducted by Suwan and Chamnongnan (2011) on the need for graduate education of teachers and educational personnel in the western region. On demand, there will be openings on Saturdays and Sundays, scholarships, and the availability of the lab. However, this research was not consistent with the research of Sommit and Suttikul



(2011) that the results depicted that the most important factor in choosing the education is the teaching and learning, particularly the use of modern technology to teach.

Recommendations

1. Universities or educational institutions in the Eastern Thailand should open undergraduate programs. Department of Logistics Management is a subject that needs social or learners. Another important aspect to be considered is the ability of the lecturer. The lecturer should be a specialist in Logistics and Supply Chain Management, and have working experience with multinational companies.

2. Educational management should be arranged outside the office hours on Saturdays and Sundays, so that regular students can study. Furthermore, the universities or educational institutions in the Eastern Thailand should plan to provide the School of Business Administration majoring in International Logistics Management as well as support research funding or scholarship, such as the cost of registration for academic papers or research papers. It should also include Logistics and Supply Chain labs for students who are well-equipped with computers and high-speed internet.

3. University or educational institution in Eastern Thailand should plan to open a bachelor degree program majoring in International Logistics Management, and publish related information to those who are interested in the major. The focus may be on social media which is currently popular. Therefore, students who want to study in this course can prepare their own study plan.

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A Study of Problem Conditions of Internships of Student Teachers in Mathematics

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ABSTRACT

The purpose of this research was to study the problem conditions of internships of student teachers in mathematics, such as the academic supervisor, the mentor teacher, the students in class, the students, the in-class research, the practicing school, and the friends .The target sample was 50 teacher students of Mathematics Branch, Faculty of Education at Suan Sunandha Rajabhat University who enrolled in the first semester of academic year 2017. The research instrument used in this study was a questionnaire. The statistics used were mean and standard deviation. The research findings showed that concerning problem conditions of internships of student teacher in mathematics in the overall level was little. The values were presented in descending order as the students in class, the in-class research, the practicing school, the students, the mentor teacher, the academic supervisor, and the friends, respectively.

Keywords: *Problems, Internships*

INTRODUCTION

Faculty of Education at Suan Sunandha Rajabhat University composes 2 regular curriculums of Bachelor of Education Program in Basic Education including Educational Technology and Innovation Branch (4 years), and Education Branch (5 years) in 5 major courses of Thai Language, English Language, Science, Mathematics, and Early Childhood Education.

Mathematics is a very useful subject, such as the self-development of ideas. In accordance with the core curriculum of basic education in year 2008, Mathematical education plays an important role in the development of human thought, such as make human creativie, think logically and systematically, be able to analyze problems or situations carefully as well as help human to predict, plan, solve problems, and apply them in daily life. (Ministry of Education, 2009). There is a number of students who are interested in enrolling in the national admission.

In the Mathematics curriculum, the fifth year students are required to internship their course teaching practice to join schools including the Demonstration School of Suan Sunandha Rajabhat University, Yothinburana School, Satri Watrakhang School, Wat Rajadhipas School, Ratchawinit School, Wat Noi Noppakhun School, Mathayom Wat Makutkasat School, Mathayom Wat Dusitaram School etc. to encourage students to have working experience before going to be teacher, such as preparing a lesson plan, knowledge transferring, class controlling, class researching etc. From the student discussion and inquiry, it was found that the students from each school had different problems (i.e. some of them have difficulty adjusting to their mentor teacher, teaching skills, class controlling). Some students who had the intention to internship their course teaching to be a good teacher had a feeling of symptoms, such as depression, anxiety, lacking of self-confidence, to not to internship their course teaching, and did not want to be a teacher as much as in the first year.

Based on the above information, the researcher as a teacher of Mathematics from Faculty of Education, Suan Sunandha Rajabhat University, was aware of the importance of the problem conditions of internships of student teachers in Mathematics in course teaching practice of the fifth year students in Mathematics from Faculty of Education, Suan Sunandha Rajabhat University.



LITERATURE AND THEORY

There were many researches investigating on the problem conditions of internships of students. Kritsane Songswat (2005) found that the practical planning factor was more effective than the other factors including planning factor, improvement and correction factor, personal factor of advisor experience variable, and personal factor of gender variable respectively. These could be used to predict and explain the variance of course teaching practice in the value of 81.20%. The standard deviation of the forecast was 0.270 which corresponded to Kiatiwat Watchayakarn (2010) that according to the students, the problem of aspect of orientation, seminar and mentoring, and aspect of teaching in group learning of health education and physical education (physical education) were at low level. The problem of aspect of teaching in group learning of health education and physical education (health education), and aspect of promotion project of physical education and health education were at moderate level. Additionally, it was found that aspect of in-class research had many problems.

Praweena Aiemyeesoon (2013) found that the problems and guidelines of course teaching practice of students of Faculty of Art from Bunditpatanasilpa Institute, by their opinions, had problems at moderate level. The problems sorted ascending to descending order were presented as following: the students, the teaching actions, the preparation for teaching, the academic supervisor, the in-class research, the instructional media, the mentor teacher, and the practicing school. Accordingly, by opinion of the academic supervisor, the overall problem was found at moderate level. The problems sorted from ascending to descending order were presented as following: the practicing school, the in-class research, the instructional media, the mentor teacher, the students, the teaching actions, and the preparation for teaching. Additionally, by opinion of the mentor teacher, the overall problem was found at low level. The problems sorted from ascending to descending order were presented as following: the preparation for teaching, the students, the teaching actions, the in-class research, the instructional media, the practicing school, and the academic supervisor.

Sarocho Klaiphun (2013) found that the course teaching practice of students of Institute of Physical Education Chonburi Campus had overall problem at low level. The problems sorted from ascending to descending order were presented as following: school welfare, teaching practice, student readiness, adviser, and practicing school. Likewise, Thongchure and Sarthaphun (2012) found that the course teaching practice of students of Home Economics Education of Kasetsart University had overall problem by the opinion of students at low level followed by teaching acting and preparation of teaching with moderate level. Other problems were found at low level as well. Moreover, it was found that the problems as perceived by mentor teacher were at low level. Teaching acting and in-class research was at moderate level while other problems were at low level.

Based on the study of the problem conditions of internships of student teachers in Mathematics, the conceptual framework for this research was the problems in the course teaching practice including the academic supervisor, the mentor teacher, the students in class, the students, the in-class research, the practicing school, and the friends.

DISCUSSION

The research was conducted to study the problem conditions of internships of student teachers in Mathematics, Faculty of Education, Suan Sunandha Rajabhat University including the academic supervisor, the mentor teacher, the students in class, the students, the in-class research, the practicing school, and the friends.



METHODS

The purpose of this research was to study the problem conditions of internships of student teachers in Mathematics, Faculty of Education, Suan Sunandha Rajabhat University. The details of research methods were as following:

The target sample was 50 teacher students in Mathematics, Faculty of Education, Suan Sunandha Rajabhat University.

The research instrument was a questionnaire of the problems of course teaching practice of the students, which created and developed for the research by studying on relevant documents and researches. It was a checklist questionnaire with reliability coefficient (alpha) = 0.932 analyzed by using statistical packages.

The statistical analysis consisted of mean and standard deviation.

RESULTS

The analysis of the problem conditions of internships of student teachers in Mathematics, Faculty of Education, Suan Sunandha Rajabhat University was presented in tables below.

Table 1: The Problem Conditions of Internships of Student Teachers in the Academic Supervisor Aspect

Subject	\bar{X}	S.D.	Mean
The academic supervisor aspect	1.57	0.90	Low
Time of outlook	1.64	0.96	Low
Differrent standard of scoring	1.64	0.94	Low
Advice and suggestion in teaching	1.56	1.07	Low
Interaction between adviser and student	1.48	0.95	Lowest
Interaction between adviser and school	1.52	0.99	Low

According to Table 1, from academic supervisor aspect, it was found that the problem conditions of internships of student teachers were at low level. The majority of the respondents was found at low level. Both of different standard of scoring and time of outlook were at the highest level followed by advice and suggestion in teaching, and interaction between adviser and school respectively.

Table 2: The Problem Conditions of Internships of Student Teachers in the Mentor Teacher Aspect

Subject	\bar{X}	S.D.	Mean
The mentor teacher aspect	1.88	0.87	Low
Care of the mentor teacher	2.02	0.94	Low
Checking weekly lesson plan before teaching	1.94	0.96	Low
Interaction between the mentor teacher and student	1.78	1.06	Low
Advice and suggestion in teaching	1.86	1.07	Low
Helping and solving the problem by the mentor teacher in teaching, students in class, teacher and school etc.	1.80	1.01	Low

From Table 2, from mentor teacher aspect, it was found that the problem conditions of internships of student teachers were at low level. The majority of the respondents was found at low level. Care of the



mentor teacher was at highest level followed by checking weekly lesson plan before teaching, and advice and suggestion in teaching respectively.

Table 3: The Problem Conditions of Internships of Student Teacher in the Aspect of Students in Classroom

Subject	\bar{X}	S.D.	Mean
The students in class	2.91	0.58	Moderate
Attention to the student learning	2.78	0.79	Moderate
Cooperation in teaching and learning	2.80	0.73	Moderate
Turning in jobs/homework/exercise on time	3.36	1.03	Moderate
Talking about other things in classroom	2.98	0.94	Moderate
Doing other subjects in the classroom	2.64	0.75	Moderate

According to Table 3, from the aspect of students in classroom, it was found that the problem conditions of internships of student teachers were at moderate level. The overall of the respondents were found at moderate level. Turning in jobs/homework/exercise on time were found at the highest level followed by talking about other things in classroom, and cooperation in teaching and learning respectively.

Table 4: The Problem Conditions of Internships of Student Teachers in the Student Aspect.

Subject	\bar{X}	S.D.	Mean
The student aspect	2.03	0.56	Low
Use of psychology in communication, teaching, inducing children to study	2.32	0.74	Low
Planning and understanding the role of the teacher before practicum	2.08	0.70	Low
Controlling class while teaching	2.66	0.82	Moderate
Accuracy in the subject matter and knowledge in the subject	2.10	0.86	Low
Preparing a correct learning plan and turning in on time	1.94	0.74	Low
Diligently study for new knowledge at all time	1.96	0.78	Low
Responsibility for teaching and punctuality	1.46	0.84	Lowest
Creating a good condition in teaching	2.02	0.82	Low
Being a good role model	1.70	0.92	Low
The instructional content is in accordance with the content and the learning plan defined in the curriculum	1.92	0.88	Low
Consulting to the students	2.02	0.91	Low
Preparation for teaching	1.76	0.89	Low
Teaching the learners to attain learning objectives	1.98	0.87	Low
School trip	1.94	1.11	Low
Obtaining workload other than teaching	2.64	1.16	Moderate

From Table 4, in the student aspect, it was found that the problem conditions of internships of student teachers were at low level. Accordingly, the overall of the respondents were at low level. Controlling class while teaching was found at the highest level followed by obtaining workload other than teaching, and use of psychology in communication, teaching, inducing children to study respectively.



Table 5: The Problem Conditions of Internships of Student Teachers in the In-Class Research Aspect.

Subject	\bar{X}	S.D.	Mean
The in-class research aspect	2.60	0.61	MModerate
Problem finding	2.80	1.05	MModerate
Demographic and sampling determination	2.36	0.98	Low
Research title proposal	2.74	0.96	MModerate
Research writing outline	2.72	0.93	MModerate
Searching for relevant documents and researches	2.84	0.91	MModerate
Creating tools for the research	3.00	1.05	MModerate
Inviting the experts to inspect tools	2.06	0.89	Low
Trying out tools	2.36	0.69	Low
Selection of research statistics	2.08	0.89	Low
Data collection	2.28	0.75	Low
Data analysis and summary	2.62	0.98	MModerate
Discussion and recommendations	2.78	0.93	MModerate
Writing a complete research report	2.82	1.16	MModerate
Research presentation	2.86	1.05	MModerate
Time for adjusting as suggested by the arbiter	2.68	0.82	MModerate

According to Table 5, the problem conditions of internships of student teachers in in-class research aspect were at moderate level. Additionally, the overall of the respondents was found at moderate level. Creating tools for the research was at the highest level followed by research presentation, and searching for relevant documents and researches respectively.

Table 6: The Problem Conditions of Internships of Student Teacher in the Practicing School Aspect.

Subject	\bar{X}	S.D.	Mean
The practicing school aspect	2.18	0.81	Low
Using instructional media and audiovisual equipment	2.30	1.11	Low
Facilities for students in course teaching practice	2.40	1.10	Low
Promoting fully learning	2.14	0.83	Low
Seating for teaching preparation and checking an exercise	2.12	1.11	Low
Average conditions of the school	1.94	0.93	Low

According to Table 6, it was found that the problem conditions of internships of student teachers in the practicing school aspect were at low level. The overall of the respondents was at low level while a facility for students in course teaching practice was found at the highest level followed by using instructional media and audiovisual equipment, and promoting fully learning respectively.



Table 7: The Problem Conditions of Internships of Student Teacher in the Friend Aspect.

Subject	\bar{X}	S.D.	Mean
The Friends aspect	1.56	0.71	Low
Interaction between friends in school	1.54	0.71	Low
Collaboration in assigning work from the school	1.70	1.04	Low
Responsibility of friends' work	1.48	0.76	Lowest
Helping or discussing about teaching and being in school	1.44	0.61	Lowest
Acting of friends in school which make problem to schools or universities	1.67	0.99	Low

From Table 7, in the friend aspect, it was found that the problem conditions of internships of student teachers were low level. The overall of the respondents was at low level while collaboration in assigning work from the school was found at the highest level followed by acting of friends in school which made problems to schools or universities, and helping or discussing about teaching and being in school respectively.

CONCLUSION

Based on the study of the problem conditions of internships of student teachers, it was found that the students in class aspect had problems at the highest level followed by the in-class research aspect and the practicing school aspect respectively. The suggestions were presented as following:

1. The results of this research can be used as a guide for students, academic supervisors, and education administrations to know the information to be used for planning or solving problems of the students in the internships.
2. Further research should study other direct and indirect problems that affect the course teaching internships of student teachers.

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The 80th Anniversary of Suan Sunandha Rajabhat University

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Exploring EFL Pre-Service Teachers’ Perception of Internship Programs: Lesson Learned From Thailand

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ABSTRACT

English language teaching internship is recognized as one of the most important aspects of the pre-service teachers’ education during their degree study. According to the Bachelor of Education, English major curriculum in Thailand especially the student teachers take the internship course to practice teaching for one academic year in school of their final year after they have gained experience of English language skills and pedagogy. This paper explored pre-service teachers’ perception of internship experience in terms of (1) lesson planning, (2) teaching and learning process, (3) language assessment, (4) action research, and (5) professional relations. Fourteen English major pre-service teachers, in their second semester of the final year internship in school, were selected by purposive sampling according to voluntary basis and interview (in-depth interview) of the aspects of internship experience above. This paper reflected the details of teaching practice experience of the EFL fourteen pre-service teachers with respect to challenges during the internship namely time allocation for English classes and research conduction. It was suggested that the pre-service teachers needed support from their cooperative teachers and their university supervisors who could work well with them according to styles and readiness.

Keywords: *EFL Pre-service teachers, Internship, Teaching practice experience*

INTRODUCTION

Besides solid knowledge from teacher education and English-major courses in the curriculum, EFL (English as a Foreign Language) pre-service teachers need to experience the real situations of teacher life in school via practicum and internship. At the research site, pre-service teachers or student teachers have to spend one academic year of their final year of Bachelor of Education in school to become full-time teacher after they are trained to observe classes and record students’ learning development in three practicum courses.

As mentioned earlier, before EFL pre-service teachers are sent to school as full-time teacher, they are trained to be associated with school context by observing and experiencing EFL teachers’ teaching as well as observing learners’ development. After that, they are trained to precisely comprehend the core curriculum of basic education in Thailand covering first grade to twelfth grade in lesson planning and actual teaching with their peers. These processes were conducted through practicum courses before their final year internship in school. Therefore, during the internship year, they are mostly supervised by the EFL school teachers who are in charge known as cooperating teachers (CTs). In other words, EFL pre-service teachers have to pass three preparatory practicum courses before the internship in their final year. According to Huling (1997), teaching practice experience offers pre-service teachers a chance to observe and work with students, teachers, and curriculum in natural settings. Therefore, pre-service teachers’ internship experience is very important in teacher production process.

As required by the National Teachers’ Council, EFL student teachers have to practice their teaching in the final year of their degree in the cooperating secondary schools where qualified CTs are ready to supervise them during their time in school. According to requirement of the National Teachers’ Council, CTs have to hold at



least Bachelor of Education, English major, with at least three-year experience of EFL teaching in school and supervise pre-service teachers with pedagogical and moral support. The cooperating schools where the pre-service teachers are sent for their internship are the places of learning environment. During the period of one academic year, two semesters, the pre-service teachers would have opportunity to practice at least 8 EFL classroom teaching hours per week. Besides classroom teaching of their major subject, student teachers are required to experience other teachers’ tasks, such as mentoring their students, substitute teaching when other teachers are absent, leading extra-curricular activities, and creating projects to promote student learning, and other requested tasks in school.

When the pre-service teachers start the transition to school, they usually attend the orientation from the principal or administrative personnel informing them about the school policy and the working culture in school. After that, the head of English Department would introduce the pre-service teachers to their CTs. The matching of CTs and the pre-service teachers normally depends on the grade they are going to teach. The more competent pre-service teachers would be more likely to teach the higher grade and their supervision in school would be from the CTs who are teaching the particular grade. When the CTs and the pre-service teachers are introduced, they usually discuss about the responsibilities that the pre-service teachers are about to achieve. Whenever the pre-service teachers need advice, they should consult their CTs first. It can be said that the direct support should be from their CTs.

The tasks of the pre-service teachers include lesson planning, developing and creating teaching materials, observing learners’ development, solving learners’ academic, behavioral, and social problems, creating projects to develop good learning environment, and cooperate with other school personnel in order to complete the school assignments. It is also compulsory that each pre-service teacher conducts an action research to solve one of the learners’ problems in learning English (Practicum and Internship Manual, 2017). As there are multiple tasks that the pre-service teachers have to achieve, they really need support from others. The CTs are seen as the main source of this support because they are most available for advice during the internship period (Guyton & McIntyre, 1990). The university supervisors visit and observe classes at least once a month and give advice both in classroom teaching and action research. They are also an influential support for the pre-service teachers.

This paper explored pre-service teachers’ perception of internship experience in terms of (1) lesson planning, (2) teaching and learning process, (3) language assessment, (4) action research, and (5) professional relations. During one academic year of teaching experience in school with supports from the CTs, university supervisors, and other school personnel, how would the pre-service teachers view their internship experience?

LITERATURE & THEORY

Practicum and internship has been viewed critical to the development of pre-service teachers. It is their first hands-on experience with their teaching profession. It creates opportunities for them to develop the pedagogical skills, and it is the best way to acquire professional knowledge and competences as a teacher (Leshem & Bar-Hama, 2008). These pre-service teachers assume that they will be able to apply most of the theories they have learned in the teacher education courses in their teaching practice. Richards and Crookes (1988) pointed out that these learner teachers will gain practical classroom teaching experience and skills in selecting, adapting and developing original course material. Calderhead (1988) supports that the period of placement during practicum (internship) has an important influence on the current and future impressions learner teachers acquiring the nature of learning and teaching. Thus, the EFL pre-service teachers expect that they will gain more knowledge and experience on learning and teaching English language in school through their hands-on experience of internship. It could be said that what these novice teachers expect to gain more knowledge and skills mainly includes



pedagogical content knowledge.

Richards (2010) suggests a pedagogical content knowledge that novice teachers should be prepared as following:

1. Understand learners’ needs.
2. Diagnose learners’ learning problems.
3. Plan suitable instructional goals for lessons.
4. Select and design learning tasks.
5. Evaluate students’ learning.
6. Design and adapt tests.
7. Evaluate and choose published materials.
8. Adapt commercial materials.
9. Make use of authentic materials.
10. Make appropriate use of technology.
11. Evaluate their own lessons.

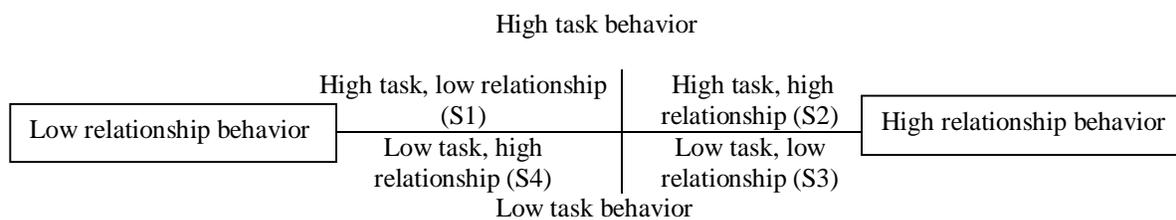
As pre-service teachers are new to the teaching profession, along this process of learning how to teach and deal with students’ problems, they needed a lot of support. They can ask for advice from their CTs and the university supervisors. However, since the internship takes place mostly at school, the CTs are the most available support for the pre-service teachers. Bailey (2006) applied the *situational leadership model* to advise the suitable way to match the pre-service teachers and the CTs.

Situational leadership model was originally created for management, but had been used in education and could be helpful for language teacher supervisors. It was suggested that effective leaders tailored their behavior to meet the needs of their followers. Orburne (1989) adapted the idea of situational leadership which was used in management to educational context. She discussed two components of leadership behavior which were task behavior and leadership behavior. These two terms were defined by Hershey and Blanchard (1982) as following:

Task behavior is the content to which leaders are likely to organize and define the roles of the members of their group (followers) to explain what each activity is to do, and when, where and how tasks are to be accomplished. Relationship behavior is the extent to which leaders are likely to maintain personal relationship between themselves and members of their group (followers) by opening up channels of communication, and providing socio emotional support (Hersey & Blanchard, 1982).

We can apply these concepts to language teacher supervision, where the CTs (leaders) must attend to both task behaviors and relationship behaviors while interacting with EFL pre-service teachers (followers). Figure 1 shows the continua of relationship and task behaviors in situational leadership. The explanation will be below the figure.

Figure1
Continua of Relationship and Task Behaviors in Situational Leadership





CTs are flexible in emphasizing or deemphasizing relationship and task behaviors. They can use either high or low task behaviors, as well as high or low relationship behavior orientations. These two constructs are plotted as overlapping continua in Figure 1. The S in each quadrant stands for ‘Style’.

In S1 quadrant, it shows high task, low relationship strategies. This means that the CTs would not attend to maintain relationships or providing socio emotional support, while he/she would provide clear guidance about the tasks to be accomplished. The main focus is on the task rather than the relationship.

In S2 quadrant, it shows high task, high relationship strategies. This means not only the CTs would attend to maintain relationships or providing socio emotional support at the high level, but he/she would also provide clear guidance about the tasks to be accomplished. In this style, the clarity about the task is maintained, but the classroom-based cooperating teachers also provide emotional support and build a positive relationship.

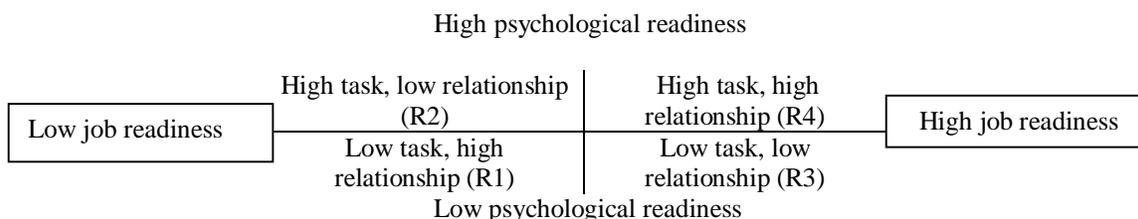
In S3 quadrant, it shows low task, high relationship strategies. This means the CTs would not be specific about the task, but would maintain or build a positive relationship.

In S4 quadrant, it shows low task, low relationship strategies. This style represents a nonjudgmental, nondirective style that is neutral as to affect and also minimalist as to specific guidance.

However, one factor that determines what leadership style to use is the person being supervised, in this case, the pre-service teachers. Is the pre-service teacher experienced or confident? One can be confident but inexperienced, or experienced but lacking in confidence. In situational leadership, these combinations are referred to as readiness.

According to Bailey (2006), there are two components of readiness; job readiness, meaning the knowledge, ability and experience to perform certain tasks without directions from others, and psychological readiness, meaning the confidence and commitment or willingness to do something. This model posits that certain leadership styles are most appropriate for working with people at given readiness levels. In other words, CTs will be more successful with their supervision if they select the combinations that work best with particular pre-service teachers. The constructions can be depicted as overlapping continua in Figure 2 and the appropriate match is proposed in Table 1.

Figure 2
Continua of Job and Psychological Readiness in Situational Leadership



Therefore, when connecting readiness (from Figure 2) and style (from Figure 1), the situational leadership model is shown in Table 1.

	Readiness	Style	Descriptor
R1	Unable and unwilling or insecure	S1 HT/LR	Provide specific instructions and closely supervise performance
R2	Unable but willing or confident	S2 HT/HR	Explain decision and provide opportunity for clarification



R3	Able but unwilling or insecure	S3 LT/HR	Share ideas and facilitate pre-service teachers in decision making
R4	Able and willing or confident	S4 LT/LR	Turn over responsibility for decisions and implementation

RELATED WORKS OR DISCUSSION

Research on pre-service teachers in English teaching field is rare in Thailand. It is worth looking at these two researches conducted in Singapore and Malaysia. Farrell (2008) explored the perceptions of 60 learner English language teachers’ experience in Singapore during the period of their school placement for teaching practice for nine weeks. The result of the study suggested that learners of English language teachers needed and wanted more support while they were on teaching practice and that the support and guidance personnel within the schools could help them to build positively on learner teachers’ success in the initial teacher education course. Wong (2010) explored pre-service teachers’ beliefs of learning English and the stability of these beliefs over time. The participants were 25 pre-service teachers (11 males, 14 females) enrolled in Bachelor of Education (TEL) program. Data analysis was completed using frequency statistics showed that generally pre-service teachers recognized the existence of foreign language aptitude and placed strong emphasis on excellent pronunciation, vocabulary acquisition, the benefits of practice, and an immersion approach to language learning. Most of them reported of being highly motivated to learn English and were positive about their ability to master the language. The findings also revealed that with the exception of slight change (ranging from 4% to 20%) to two items on language learning difficulty and six items on nature of language learning, most of their beliefs were stable over time.

METHODS

Sites and Samples

Fourteen EFL pre-service teachers consisted of 4 males and 10 females from four cooperating schools in Bangkok, Nonthaburi, and Rajburi participated in the study via voluntary basis. All of them practiced their internship during two academic semesters in 2017.

Research Instruments

Interview

They attended the in-depth interview in the second semester, and were asked how they perceived their internship experience on the following topics: (1) lesson planning, (2) teaching and learning process, (3) language assessment, (4) action research, and (5) professional relations.

Interview questions about lesson planning

- (1) What is the definition of a successful English class concerning the lesson planning?
- (2) What are the challenges in lesson planning?

Interview questions about teaching and learning process

- (3) How successful is your teaching and learning process?
- (4) What are the challenges in the teaching and learning process?

Interview questions about language assessment

- (5) How do you assess your students learning?
- (6) What are the challenges in language assessment?

Interview questions about action research



- (7) What do you think about conducting action research during the internship?
- (8) What are the challenges in action research conduction?

Interview questions about professional relations (Use options 1-6 for the questions numbers 9-10.)

- (9) During your internship in school, who is most helpful to you in academic support?
- (10) During your internship in school, who is most helpful to you in moral support?

- 1. Pre-service teachers who are doing the internship at the same school
- 2. Your cooperative teacher (CT)
- 3. The more experienced teacher in school
- 4. The head of English department
- 5. The principal
- 6. Others (please specify).....

Observation

The researcher observed the pre-service teachers’ teaching, their lesson plans, their teaching materials, and their teaching environment and take notes.

Documents

The researcher studied documents relevant to the pre-service internship experience namely “Supervising pre-service language teachers” in Language teacher supervision: A case-based approach conducted by Bailey, 2006), “Second language teacher education” in The Cambridge guide to teaching English to speakers of other languages written by (Carter & Nunan, 2001), and “Professional development” in Methodology in language teaching: An anthropology of current practice conducted by (Richards & Renandya, 2002).

Procedure of Data Collection

The interview took place at four cooperating schools. The in-depth interview of the pre-service teachers at their internship sites were conducted as guided by the interview questions according to their convenient time. The interviews were audio-taped. The researcher also took notes right after the interview and the classroom observation.

Data Analysis

The data from the transcribed interview data and the researcher’s notes were analyzed by content analysis according to themes guided by the interview questions adapted from Merriam (2009).

RESULTS

Regarding the in-depth interview with fourteen EFL pre-service teachers in four cooperating schools in three provinces, the results were presented below.

Questions1-2: The pre-service teachers were asked to define the successful English class concerning the lesson planning and what challenged them when planning the lessons. All of them had the same opinions that they agreed that the successful teaching was from the well-planned lesson. However, it was very hard for them to follow every step in the lesson plan because of the limited time allocation. Each teaching period has 50 minutes to achieve 1-3 learning objectives. The pre-service teachers had to make use of the time otherwise they would miss some content that they expected to teach. The successful teaching with respect to the lesson planning, therefore, meant the class that the students were taught all content that were planned according to the curriculum.

In addition, all of them mentioned that the challenges in lesson planning were the time allocation and the



communicative activities. The pre-service teachers tried to plan the classroom activities communicatively (according to the communicative language teaching approach). However, the actual teaching would consume too much time if they followed everything in the plan. Thus, nine pre-service teachers made shortcuts by cutting down some activities and five of them arranged the extra classes to cover the remaining content they could not finish in the allocated regular time.

Questions 3-4: The pre-service teachers were asked whether the researcher could observe their teaching and learning process whether it was successful and what the challenges they confronted to achieve the goals. Thirteen pre-service teachers were observed and found that their teaching and learning process successful in terms of fun atmosphere, observing from the energetic movement of the learners along the class participation. Only one among the fourteen felt her class was not very successful because most of the students do not understand the lesson so that they could not do the exercise well. The challenges of the successful teaching and learning process concern the background knowledge about vocabulary and grammar. The pre-service teachers said that they had to explain a lot of linguistic points which should have been taught before the level they were teaching.

Questions 5-6: The pre-service teachers were asked to explain how they assessed their students' learning. All of them assessed the learning by using teacher-made tests: formative and summative tests. The most popular type of test was multiple-choice test with four options. Other types were gap filling and matching. When asking about the non-test assessment, all of them assign students to do projects such as Christmas, Halloween, etc. However, when asked about the challenges of language assessment, they all said that test designing was challenging or difficult for them. During their internship year, the CTs could not let them to make the entire test papers. Pre-service teachers were assigned to make about twenty-five percent of multiple-choice test items and they needed to be edited by the CTs.

Questions 7-8: The pre-service teachers were asked about conducting action research; what they thought about it and what challenges were. All of them thought that action research conduction was very difficult, especially at the beginning of conducting it. They found a lot of problems, but they had to choose one topic to do research. Four of them chose to do research on listening and speaking because the principal urged that the secondary school learners should be able to communicate in English well. The rest chose research topics with their CTs and also asked for help from the university supervisors.

Questions 9-10: The pre-service teachers were asked to point out from a list of people who were most helpful to them both for academic and moral support during the period of internship. Actually, they would like to give more than one answer. All of them were close to their CTs and other experienced teachers, especially those who sit in the same teacher's room. Five out of fourteen mentioned they could consult moral support with the principal. They could consult academic problems raised in the classroom with their CTs and the experienced teachers. For the action research conduction, seven of them preferred talking to the university supervisor, while eight teachers received advice and went hand-in-hand in research conduction with their CTs.

CONCLUSION AND FUTURE WORK

In this paper, the pre-service teachers who were the final-year students of the five-year curriculum, Bachelor of Education, English major attended the in-depth interview in their second semester about their perception of internship experience in terms of lesson planning, teaching and learning process, language assessment, action research, and professional relations. In order to plan communicative activities for English teaching, the pre-service teachers recommended to increase more time allocation for English class. They planned the lessons according to the curriculum and wanted to finish all of the content as they planned. In spite of the students' not-so-good background knowledge of grammar, most of the pre-service teachers could fulfill the English class with



fun atmosphere. Pre-service teachers practice making tests, but did not have opportunity to make the entire test paper. They need editing and supervising from their CTs. The research conduction seemed to be the hardest part of the internship. However, the pre-service teachers would make decision to choose who they would consult according to those people’s expertise.

It was understandable that not all CTs were good at research conduction though they had many years of teaching experience. Neither were the university supervisors. For the future research, the research about teacher education can apply situational leadership model to the supervisory model for EFL pre-service teachers so that the pre-service teachers, the CTs, and the university supervisors could work together according to their styles and readiness. As Farrell (2008) explored the perceptions of pre-service teachers in Singapore, pre-service teachers needed support from the available supporters around them namely cooperating teachers, experienced teachers at the internship site, the university supervisors and their peers. While Wong (2010) reflected that the majority of pre-service teachers believe that the English teaching subject matters should be focused on pronunciation, vocabulary and the English teaching approaches. Thus, the pre-service teachers should be supported with those aforementioned aspects.

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Development of Creative Thinking in Art Education of Grade 6 Students Using Worksheets

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ABSTRACT

The main goal of this research was to study the effects of using the art education on creative thinking by using worksheets, and there were two subordinate objectives including 1) to study the development of ideas from learned tasks in creating art works, and to compare the achievement of the idea development from the use of art instructional worksheets as well as the art skills before and after the experiment. The participants in this study were 88 grade-six students. The research instruments consisted of art tasks for grade 6 students in the form of worksheet. In addition, the worksheets covered three units including unit 4 (Creative Materials Matters in Science), unit 5 (My Village) and unit 6 (Planet Earth Hero). Overall, there were 7 worksheets including Worksheet 1 (Color Hot Cold Cake), Worksheet 2 (Gradient Drawing Activity), Worksheet 3 (Drawings and Short Stories), Worksheet 4 (Drawing Topic around the School), Worksheet 5 (Creative Activities Topics in the Bazaar), Worksheet 6 (Cosmic and Space Drawing Activities) as well as Worksheet 7 (Activity Creating Children's Day). According to data analysis, SPSS/PC+ (Statistical Package for Social Sciences/Personal Computer Plus) was used to analyze data for percentage, mean and standard deviation. The data of general characteristics of respondents indicated that the majority of respondents in overall was 31.81% which could be separately explained as male (60%), female (68.19%) and female (28.8%) in the class 6/1, 6/2, and 6/3 respectively. Moreover, it was showed that the grade level of the overall respondents was 10.22% having 30 students in class 6/1 (34.10%), followed by 29 students in class 6/2 and 6/3 which had an equal amount of 32.95%. These students are encouraged to develop their creative thinking by using the worksheets, and their creative development values were compared afterward. The results revealed that there was a high level of the before and after development of creative thinking. Noticeably, after providing instructional worksheets, there was a moderate level of fluency in thinking, a high level of flexibility in thinking, a high level of originality as well as a moderate level of elaboration.

Keyword: *Creative development, Worksheet, Learning Process*

INTRODUCTION

According to the core curriculum of basic education, all learners can be developed, and they will become the crucial power by their balanced humanity, morality and consciousness to Thailand as well as the world. Adhering to democratic rules and monarchy and having knowledge, basic skills and positive attitude are necessary to education. In order to provide strong foundation for future career or higher education, teaching and learning should emphasize on learners by letting learners learn and develop knowledge and skills themselves, under the potential, morals, ethics and desirable values, self-esteem, knowledge, ability to communicate, thinking, problem solving, use of technology as well as life skills. In order to develop ability to communicate, to think, ability to solve problems, ability to use life skills and ability to use technology, the program should be initially designed to help students develop their creative thinking. Having imagination in art helps learners appreciate beauty,



aesthetics and value of art. Consequently, students change their behavior to the right target. The art of learning is to develop students to understand, and have artistic skills. On the other hand, appreciation allows students to express themselves freely in various arts, and to develop themselves as creative people. Teaching students to think is a way to enhance them to express feelings in the way of creativity. Instruction to develop students' creativity needs learning activities which stimulate students to understand, and able to solve problems successfully as well as express themselves. There are many ways to fully encourage students' learning, (e.g., a self-study and exploring and experimenting their own interests) and creative personality (e.g., promoting curiosity and self-practice). With the aim of integrating arts and instruction for creative development, teaching and learning by using worksheets covering creative elements may be effective. Besides, it may also be able to accomplish students' achievements various aspects of artistic creation.

LITERATURE AND THEORY

According to the Basic Education Curriculum curriculum 2008, the Art Education Group (Visual Arts), and the Research on Creative Thinking and Educational Quality Assurance, at present, there is a need to be alert to quality assurance in education, and art (visual arts) is very important for the development of creative learners. In order to maximize learning efficiency of students of the Demonstration School of Suan Sunandha Rajabhat University, creative ideas through the use of art lessons should be promoted. For teaching management, the five concepts or techniques should be considered. (1) Promoting teaching to develop creativity helps creative development of students. (2) Teacher is one of the key elements as a teacher has direct responsibilities to teach students to change their behavior in a positive way. (3) Creative teaching focuses on changing knowledge, thoughts, feelings, attitudes, and self-development to being creative. (4) Emphasizing on students to think. (5) Expressing feelings is one way of creativity. For teaching to develop students' creativity, the courses and activities should be organized as followed: (1) Encourage students to learn by themselves. (2) Encourage students to be observant. (3) Ask questions and answer questions. (4) Be interested and listen to new questions of students. (5) Show that students' ideas are valuable by encouraging them. (6) Honor, praise and use the work to benefit. (7) Encourage students to take initiative. (8) Encourage students to self-study, explore, experiment. (9) Encourage children to have creative personality. To promote curiosity, self-practice and artistic creativity, the teachers should concern four elements of creativity Including fluency, flexibility, originality and elaboration. Fluency Score which relates to the fluidity of thinking can make a score by counting the number of images that are clear, meaningful and understandable or counting the number of images that are unique or different. Flexibility in thinking can be scored by taking the picture, as all the answers in the test are rated for the ability to think and then grouped or classified by their category or direction. In other words, the pictures which have the same meaning, one direction or same type are grouped together. For initiatives (Originality), initiative score is making sure that each image has the same meaning or style as the percentage. If the meaning of any image has many drawers, it will be scored less or not. If the meaning of any painting is less unique to each other, it will be scores a lot. Thoughtful (Elaboration), which is a critical thinking assessment, adopt the scoring rubric of primary school coloring, artistic elements (e.g., spot, line, color, shape, shape, surface, space), principles of image (e.g., size, proportion, rhythm, balance, harmony) and other criteria. Other details conflict unity are added to expand or describe the picture more clearly. For example, shading (i.e., the use of light or color) or coloring representing realistic features can decorate the image. When the image has changed, extensive details to better understand the image are illustrated.



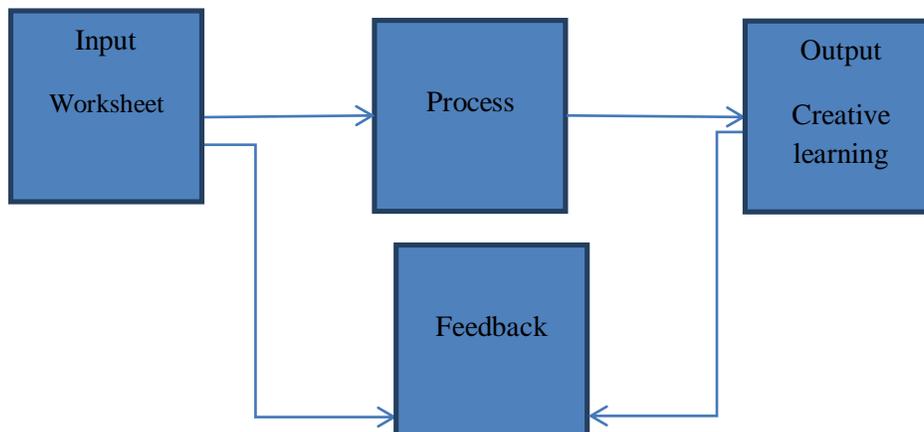
RELATED WORKS

Prayong Saeng (1998) studied on art creativity of Pratomsuksa 6 students in schools under the jurisdiction of Chaiyaphum Provincial Primary Education Office. The students' creativity was low. The creative thinking of female and male students was different. Students in schools located in municipalities and sanitary districts and schools located outside the municipality and sanitary district had different artistic creativity. In addition, artistic creativity was positively correlated with academic achievement.

According to Pookpong (2003), creating a lesson plan for an art course on painting for Prathom 6 students found that coloring of the Art Education program was suitable for the sixth graders as there were 35 straight lines for learning purposes. The program curriculum was 90/90 effective, and had a performance index of 0.50 and above, which was in line with the set criteria.

METHODOLOGY

This research is experimental research which aimed to study the effect of the use of art instructional workbooks. The participants were 88 students in Suan Sunandha Rajabhat University Demonstration School. The target group was designated as Prathomsuksa 6, Suan Sunandha Rajabhat Institutes Demonstration School. The variable was the instructional activity through the use of the art form and the lesson plan for art composition for Prathomsuksa 6 of Suan Sunandha Rajabhat University Demonstration School. The mean score of the posttest scores on the use of the skill-based learning package. The tools used in the research were: forms of artistic learning for students in Prathom Suksa 6, and the creative thinking process developed by the researcher. The three learning plans in the three learning units included unit 4 (Creative Materials Matters in Science), unit 5 (My Village) and unit 6 (Planet Earth Hero). There were seven works including Worksheet 1 (Color Hot Cold Cake), Worksheet 2 (Gradient Drawing Activity), Worksheet 3 (Drawings and Short Stories), Worksheet 4 (Drawing Topic around the School), Worksheet 5 (Creative Activities Topics in the Bazaar), Worksheet 6 (Cosmic and Space Drawing Activities) as well as Worksheet 7 (Activity Creating Children's Day). There were three steps to create, and develop the worksheet which were: 1) Study coreCore Curriculum 2008, group 1, visual arts class 1 and related research for gathering information. 2) Analyze data from documents, research related to creativity in the arts and Core Curriculum 2008. 3) Make worksheets of art skills training, and Make a plan to learn art for Prathomsuksa 6 students. For the arts management plan for the students in the Prathomsuksa 6, the 3 learning units of 7 activities were created by the researcher in order to use in the practice of learning the art. The process of creating and developing creative thinking were:1) Study the principles of art (i.e., Lesson 1: Visual Arts of Prathomsuksa 6) in the Core Curriculum 2008 in order to indicators and standards of learning. 2) Create a learning management plan for the Prathomsuksa 6 students, and develop the 3 learning units with 7 contents, corresponding to the practice of learning skills in art, learning activity design time spent on activities and difficulty of the training. 3) Implement a learning management plan.





Results

The majority of respondents in overall was 31.81% which could be separately explained as male (60%), female (68.19%) and female (28.8%) in the class 6/1, 6/2, and 6/3 respectively. 10.22% of respondents classified by grade level having 30 students in class 6/1, (34.10%), followed by 29 students in grade class 6/2 and 6/3, which had an equal amount of 32.95%.

The data analysis covered general information of the respondents as well as information on the status of the respondents. Additionally, data analysis employed percentage distribution for calculating percentage. The frequency and percentage were classified by sex and class. Table 4.1 showed that the respondents were divided into 3 classes including 6/1, 6/2, 6/3, and each had male and female sub-categories in the table, there were 10 female students or 11.36% in 6/1, whereas there were 9 students or 10.22% in 6/2 and 6/3.

Table 4.1

Class	Sex	Number	(%)
P.6/1	male	20	22.73
	Female	10	11.36
P.6/2	male	20	22.73
	Female	9	10.22
P.6/3	male	20	22.73
	Female	9	10.22
TOTLE		88	100.00

Table 4.2 showed that the majority of respondents were 60 males or 68.19% and 28 females accounted or 31.81%.

Table 4.2

Sex	Number	(%)
Male	60	68.19
Female	28	31.81
TOTLE	88	100

Table 4.3 showed that respondents classified by grade level as evidenced by 30 students or 34.10% in 6/1, followed by 29 students or 32.95% in 6/2 and 6/3.

Table 4.3

Class	Number	(%)
P. 6/1	30	34.10
P. 6/2	29	32.95
P. 6/3	29	32.95
TOTLE	88	100



Table 4.4

No.	Criteria	Level Comments			Level Comments		
		The pretest			The post-test		
		\bar{X}	)S.D(	Results	\bar{X}	)S.D(	Results
1	Fluency	3.12	.44	medium	3.53	.57	Very level
2	Flexibility	3.11	.43	medium	3.52	.56	Very level
3	Originality	3.04	.41	medium	3.23	.46	medium
4	Elaboration	2.43	.27	little	3.25	.47	medium

Table 4.5

No.	Criteria	Level Comments			Level Comments		
		The pretest			The post-test		
		\bar{X}	)S.D(	Results	\bar{X}	)S.D(	Results
1	Fluency	3.02	.44	medium	3.59	.54	Very level
2	Flexibility	3.07	.49	medium	3.67	.59	Very level
3	Originality	3.23	.49	medium	3.46	.52	medium
4	Elaboration	2.98	.37	medium	3.57	.51	Very level

Table 4.6

No.	Criteria	Level Comments			Level Comments		
		The pretest			The post-test		
		\bar{X}	)S.D(	Results	\bar{X}	)S.D(	Results
1	Fluency	3.20	.46	medium	3.59	.51	Very level
2	Flexibility	2.87	.37	medium	3.37	.48	medium
3	Originality	3.11	.43	medium	3.56	.53	Very level
4	Elaboration	2.94	.38	medium	3.27	.47	medium

Table 4.7

No.	Criteria	Level Comments			Level Comments		
		The pretest			The post-test		
		\bar{X}	)S.D(	Results	\bar{X}	)S.D(	Results
1	Fluency	3.30	.42	medium	3.54	.57	Very level
2	Flexibility	3.47	.57	medium	3.56	.59	Very level
3	Originality	3.35	.41	medium	3.53	.56	Very level
4	Elaboration	3.46	.45	medium	3.58	.58	Very level



Table 4.8

No.	Criteria	Level Comments			Level Comments		
		The pretest			The post-test		
		\bar{X}	)S.D(	Results	\bar{X}	)S.D(	Results
1	Fluency	3.40	.52	medium	3.79	.67	Very level
2	Flexibility	3.47	.54	medium	3.88	.69	Very level
3	Originality	3.36	.51	medium	3.89	.66	Very level
4	Elaboration	3.40	.51	medium	3.69	.68	Very level

Table 4.9

No.	Criteria	Level Comments			Level Comments		
		The pretest			The post-test		
		\bar{X}	)S.D(	Results	\bar{X}	)S.D(	Results
1	Fluency	3.30	.51	medium	3.59	.57	Very level
2	Flexibility	3.46	.54	medium	3.68	.65	Very level
3	Originality	3.46	.54	medium	3.69	.67	Very level
4	Elaboration	3.30	.51	medium	3.79	.69	Very level

Table 4.10

No.	Criteria	Level Comments			Level Comments		
		The pretest			The post-test		
		\bar{X}	)S.D(	Results	\bar{X}	)S.D(	Results
1	Fluency	3.40	.51	medium	3.60	.59	Very level
2	Flexibility	3.56	.57	Very level	3.68	.62	Very level
3	Originality	3.56	.57	Very level	3.62	.60	Very level
4	Elaboration	3.41	.51	medium	3.64	.62	Very level

CONCLUSION AND FUTURE WORK

According to the comparison of the level of student achievement in creative development, the before and after of worksheet 1 (Color Hot Cold Cake) of students in Demonstration School in Suan Sunandha Rajabhat University showed that the total of 88 respondents were successful in developing their creativity by using the pre and post worksheet 1. Moreover, for fluency in the thinking before the class, the results were moderate. After using the worksheet, the achievement was at a high level. For flexibility in thinking, the results were moderate. After using the worksheet, the achievement was at a high level. For initiative (Originality), the results were moderate. After using the worksheet, the achievement was at a high level. For thoughtful (Elaboration), the results were low. After using the worksheet, the achievement was at a high level.

The comparison of the level of student achievement in creative development by using the worksheet, before and after the worksheet 2 (Gradient Drawing Activity) of students in Demonstration School in Suan Sunandha Rajabhat University showed that the total of 88 respondents had a level of achievement in Worksheet 2. In addition, for fluency in the thinking before the class, the results were moderate. After using the worksheet, the



achievement was at a high level. For flexibility in thinking, the results were moderate. After using the worksheet, the achievement was at a high level. For initiative (Originality), the results were moderate. After using the worksheet, the achievement was at a high level. For thoughtful (Elaboration), the results were moderate. After using the worksheet, the achievement was at a high level.

The comparison of the level of achievement of students’ creative development by using the worksheet, before and after Worksheet 3 (Drawing a Story) of students in Demonstration School in Suan Sunandha Rajabhat University showed that the total of 88 respondents had a level of achievement in the third task, drawing, topic, drawing, short story, and essay in the development of creativity. Moreover, for fluency in the thinking before the class, the results were moderate. After using the worksheet, the achievement was at a high level. For flexibility in thinking, the results were moderate. After using the worksheet, the achievement was at a high level. For initiative (Originality), the results were moderate. After using the worksheet, the achievement was at a high level. For thoughtful (Elaboration), the results were moderate. After using the worksheet, the achievement was at a high level.

The Comparison of the level of student achievement in creative development By using the worksheet, before and after the Worksheet 4 (Drawing Topic around the School) of students in Demonstration School in Suan Sunandha Rajabhat University showed that there were 88 participants in the questionnaire, and the achievement of the Worksheet 4 were shown as followed: For fluency in the thinking before the class, the results were moderate. After using the worksheet, the achievement was at a high level. For flexibility in thinking, the results were moderate. After using the worksheet, the achievement was at a high level. For initiative (Originality), the results were moderate. After using the worksheet, the achievement was at a high level. For thoughtful (Elaboration), the results were moderate. After using the worksheet, the achievement was at a high level.

The comparison of the level of achievement of the students in creative development by using the before and after of Worksheet 5 (Creative Activities Topics in the Bazaar) of students in Demonstration School in Suan Sunandha Rajabhat University showed that the total of 88 respondents attained the achievement level in the activity of the topic of the bazaar, which is an important element in the development of creativity were: For fluency in the thinking before the class, the results were moderate. After using the worksheet, the achievement was at a high level. For flexibility in thinking, the results were moderate. After using the worksheet, the achievement was at a high level. For initiative (Originality), the results were moderate. After using the worksheet, the achievement was at a high level. For thoughtful (Elaboration), the results were moderate. After using the worksheet, the achievement was at a high level.

Regarding the comparison of the level of student achievement in creative development by using the worksheet, before and after Worksheet 6 (Cosmic and Space Drawing Activities)of students in Demonstration School in Suan Sunandha Rajabhat University showed that there were 88 students in total, and the achievement level in Worksheet 6 was presented as followed: For fluency in the thinking before the class, the results were moderate. After using the worksheet, the achievement was at a high level. For flexibility in thinking, the results were moderate. After using the worksheet, the achievement was at a high level. For initiative (Originality), the results were moderate. After using the worksheet, the achievement was at a high level. For thoughtful (Elaboration), the results were moderate. After using the worksheet, the achievement was at a high level.

The comparison of the level of student achievement in creative developmentby using the worksheet, before and after Worksheet 7 (Activity Creating Children's Day) of students in Demonstration School in Suan Sunandha Rajabhat University showed that there were 88 students in total, and the achievement in the Worksheet 7 were presented as followed: For fluency in the thinking before the class, the results were moderate. After using the worksheet, the achievement was at a high level. For flexibility in thinking, the results were moderate. After using the worksheet, the achievement was at a high level. For initiative (Originality), the results were moderate. After



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using the worksheet, the achievement was at a high level. For thoughtful (Elaboration), the results were moderate. After using the worksheet, the achievement was at a high level.

LIMITATIONS AND FUTURE STUDIES

Based on this research, the researcher would like to inform that the future research will be beneficial if it covers these following suggestions. 1) For the content of the creative thinking process, the content should be valid, concise and clear to prevent students from being bored. 2) When students do the exercises, they should be inspected immediately so that the students know the results. Students are encouraged to do the next exercise. 3) Teachers should create self-confidence for students by creating a good atmosphere for activities such as discussion, questions and problems of students. 4) The future research should be done to develop the media. Teaching materials, activities or teaching tools or other methods can continuously improve the students' artistic learning skills. 5) There should be study, measurement and evaluation according to the class standards of the students to meet the actual conditions.

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A Development of an Instructional Model Based on Model of the Development of the Teachers’ Competencies for Thailand 4.0 for Student Teachers

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ABSTRACT

The purposes of this research were (1) to create and evaluate the quality of an instructional model based on the development of the teachers’ competency approach for Thailand 4.0 called the TIPs Approach for student teachers at Suan Dusit University, and (2) to study the result of an implementation of the instructional model. The sample of this research was the student teachers who were studying the diploma program in teaching profession of the Faculty of Education at the Suan Dusit University. Research instruments were (1) the instructional model and handbook of the TIPs approach, (2) the evaluation form for the TIPs Approach design, and (3) Achievement Test. Data analysis comprised mean, standard deviation, t-test, and content analysis.

Results of the study showed that the instructional model had four main elements of the model that compound the teacher competency including TIPs approach, implementation of the model, and outcomes from the students. Evaluation of the instructional model found that the TIPs approach value was high, and indicator of the effectiveness was 0.7510. Accordingly, the result of the implementation found that student teachers had high score both in an achievement score and the learning ability design score after they studied with the higher value of 70 percentages at $\alpha = 0.01$. In addition, it was found that a majority of students was satisfied to study with the TIPs approach.

Keywords: *Instructional model, TIPs approach, Teacher competency development, Student teacher*

INTRODUCTION

The fourth industrial revolution and the millennium development goals has recently come to Thailand. General Prayut Chan-O-Char, Prime Minister and chairman of the National Reform Council (NRC) took responsibility for Thailand’s education policy (OECD/UNESCO, 2016). He pointed out that Thailand needed to escape the middle-income trap, and the higher institutions should take full advantage of modern Thailand 4.0 and focus on creative spirit, scientific spirit, innovation spirit, practice ability and entrepreneurial capacity to meet all around education quality. The core of education quality is to train student’s creative ability. The innovation and creativity aim to support Thailand to move forward from developing country to be developed country. The university is an important place to train students all around quality, such as creative ability, practice, experiment, organization, analysis, and especially how to solve problems. In addition, the university should cultivate the awareness of innovation through improving critical thinking and innovation experimental teaching. Encouraging of innovation is not only a good environment of learning and researching but also is a stage of displaying their new thought and ideas. However, developing of innovation was found rather slowly in many universities all along. For example, the types and qualities of equipment are inadequate to meet the teaching and learning basis. Furthermore, at the same time, their levels of technical skills are low, unsystematic, and imperfect. Additionally, some important equipment and innovative experimental



equipment is scarce and out of date. The designing and innovative experiments are quite rare including the development of the teaching quality of undergraduate students. At the same time, every university has own special and advanced discipline, and needs to focus on their effort to keep them. Some universities have identified their characteristics, such as university of research, university of learning and teaching, and university of technology. Most universities identified themselves as the teaching and learning university that taught only undergraduate studied especially Faculty of Education which usually provide educational program with objectives of teaching and training student teachers. Student teachers have to prepare themselves to be a teacher through practice in classroom that teachers who are working in the office of the Basic Education Commission must have two main characteristics which are the core competencies comprising of five competencies, and the functional competencies comprising of six competencies.

The purposes of this research aimed to develop an instructional model and evaluate the quality of an instructional model based on the development of the teachers’ competencies approach for Thailand 4.0 called the TIPs approach for student teachers at Suan Dusit University as well as to investigate the effects of the use of the instructional model.

Therefore, the research about instructional model has become relatively rich, but there were too many ideal factors in the teacher’s competencies. They were not coincided with realistic environment and objectives of this experiment. In the following section, an overview of literature review and theories were presented as well as the description of research methodology. Additionally, section 3 briefly presented results of the study followed by the conclusion and future work section.

LITERATURE AND THEORY

According to NSW Education Standard Authority (2017), Ohio Department of Education (2009), and Iowa Department of Education (2009), the main competencies of teacher standards were seven professional standards. First, teachers must know students and how they learn. Second, teachers must know the content and how to teach it. Third, teachers must have implement for effective teaching. Fourth, teachers must create and maintain safely learning environment. Fifth, teachers must provide feedback and report on students learning. Sixth, teachers must engage in professional learning. Last, teachers must engage with colleague, parent and community. Moreover, related findings of the report of Office of the Educational Council (2017) found that teaching quality was the most important requirement for Thai teachers especially teacher institutes. They created the graduated students who did not meet the qualifications, such as skills, knowledge, and teaching competencies. Moreover, Puangtong (2004) found that the development of instructional model integrated with thinking skills and knowledge constructivism for undergraduate students could support them to create the knowledge by using the instructional model which comprised six main components including rational, objectives, content structure, task analysis, instructional units, and measurement and evaluation of the learners. Additionally, she explained more about the model that “A model is an application of a theory to a particular phenomenon, and a theory is a precise deductive system, more general than a model”. However, theories are often grouped into frameworks that a framework is a general set of concepts for understanding a domain, but it is not sufficiently organized to constitute a theory while some framework can deduct various predictive theories (Nyshanova, Baimukhanbatov, Abdigapharova, & Mukhamedzhanov, 2014). However, instructional design plays an important role in development of teaching competencies for student teachers because the instruction is a systematic process including teachers, learners, materials, and learning environment. These components are crucial to successful learning. A great number of instructional design models has been emerged to meet different teaching purposes. The model places a premium on individualized teaching and independent learning and makes full use of the special function of teaching competencies which is assisting learners with practicing. Therefore, the present study was carried out based on the following research questions:



1) What are the necessary components and steps of instructional model for development of the teachers’ competencies approach for Thailand 4.0 for student teachers called TIPs model at Suan Dusit University?

2) How effective is the developed instructional model in facilitating student teachers’ ability development which brings the result of an implementation of the instructional model?

A development model of an instructional model based on model of the development of teachers’ competencies for Thailand 4.0 for student teachers (TIPs approach) considered as the instructional design issues for preparing student teachers. The two steps were criticizing for an instructional model that was the developing instructional module and specifying teaching methods and instructional medium.

METHODS

The present study consisted of two phases including developing the TIPs model, and investigating effects of using TIPs approach. When the TIPs approach had been designed, it was sent to three experts in instructional systems design and the teaching field to review and evaluate whether the model was appropriate, clear, and easy to implement. After that, two intact classes were selected to participate in the experiment to investigate the effects of using the TIPs Model in the first semester of academic year of 2018.

Phase 1: Developing the instructional model

1.1 Participants

The participants were selected through purposive sampling to review and evaluate the TIPs model. It consisted of three experts in both instructional systems design and the teaching field. They were from 2 university of Thailand, and all of them had Ph.D. degree.

1.2 Instructional

An evaluation form of the TIPs model was designed by the researchers as there was no previous related study. The form consisted of two parts. Part 1 included 10 items on a five-point scale (5=very strongly agree, 4= strongly agree, 3= strongly agree, 2=slightly agree, 1= least agree). Part 2 was an open-ended question about ideas and comments on the TIPs model.

1.3 Data collection and analysis

Before instrument implementation, the evaluation form of the TIPs model was sent to the experts for evaluation. The TIPs Model was reviewed on the basis of experts’ evaluation and suggestions. Descriptive statistics were used to calculate arithmetic mean and standard deviation.

Phase 2: Investigating the effects of using the TIPs Model.

2.1 Participants

Two intact classes of Faculty of Education, Suan Dusit University, Thailand, were selected. They were first-year of the Graduate Diploma Program in Teaching Profession. They were selected because the number of students in each class was the same size, and the grade point average (GPA) was similar. The final examination in the first year of academic year 2018 was used to determine the sample. The total number of samples was 96 students: Class 2 had 48 students (M=62.74, SD=8.74), and Class 4 had 48 students (M=68.74), SD=10.115). Class 2 was chosen as the experimental group and class 4 was the control group.

2.2 Research Instrument

In the study, two instruments including the TIPs model lesson, and the achievement test were employed. In addition, the researcher constructed the TIPs lesson, learning tasks, and learning activities which were embedded in modules, such as forum, project, and quiz.

In this experiment, tests were employed for pre-test and post-test. The comprehension tests were adapted from the achievement test which was designed to evaluate the overall of the research for learning development proficiency of the Graduate Diploma Program in Teaching Profession at Suan Dusit University. Before the main study, both tests had been examined for reliability with the students who were not from the classes of the experiment.



2.3 Data collection and analysis

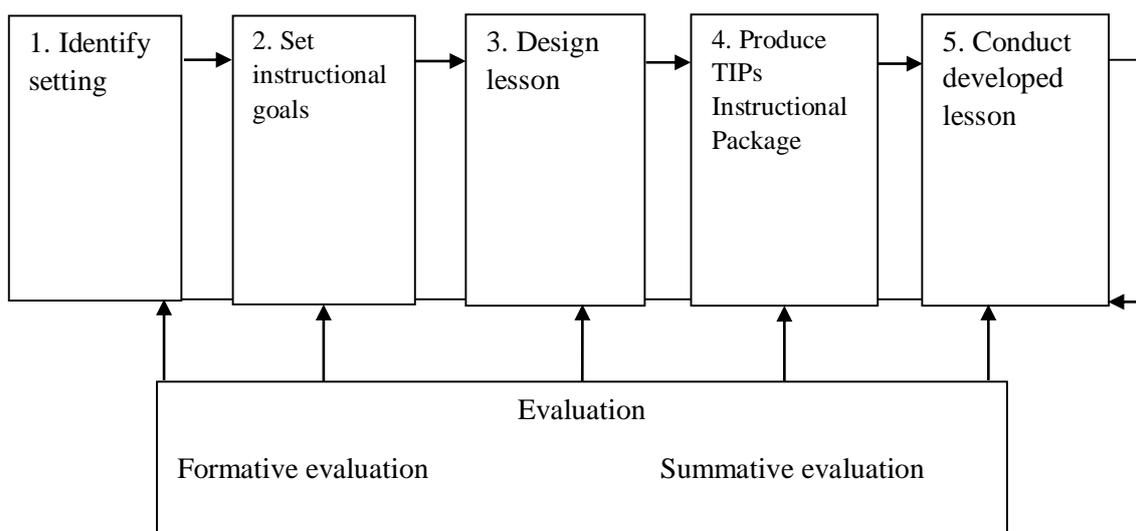
Before the experiment, the experimental classes and the control classes were pre-test. Only participants in the experimental group were involved with the TIPs lesson via module, while the students in the control group were still instructed with the students’ teaching. After the experiment was conducted, the experimental and control classes were post-tested as to analyze whether there were any significant differences in teaching competencies between the experimental and control classes.

The computer software program SPSS was used to conduct descriptive and statistical analysis in the present study. Descriptive analysis involved the mean score of both the pre-test and post-test results. The statistical analysis was t-test used to compare the participants’ mean scores on the pre-test and post-test. Analysis of covariance (ANCOVA) was used to remove extraneous variability that derives from pre-existing individual differences.

RESULTS

4.1 Design of the Instructional Model for TIPs Model

The TIPs model was a guideline to help instructors to construct teachers’ competencies lessons which enhance the possibility of teaching and learning and encourage the engagement of the student teachers. The orientation of the TIPs model was systematic and task based approach. This model included 6 phases and 7 steps in the process.



Phase 1 Identify setting

Before the instructional process was designed, it was necessary to identify the background and problems of teachers’ competencies instruction. This phase was the base of the whole instructional process.

1.1 Conduct needs analysis

This step was to identify the needs and problems of the student teachers. The finding of the analysis could contribute to setting instructional goals and learning objectives as well as helped instructors to draw the main components and requirements into TIPs approach.

1.2 Analyze existing curriculum

It was necessary to analyze the existing curriculum or syllabus because it was a defined and prescribed course of studies. Instructors should focus on analyzing the requirement for teaching skills.



1.3 Identify learning context

Analysis is focused on the learning environment and instructional structure. For the learning environment, instructors are concerned about organizing minimum requirements including research problems, literature review, collecting data and analysis, and reporting.

1.4 Analyze Instructional content

Instructor analyzed the domain (type) and sequence (level) of the TIPs contents. A content domain analysis identified whether the main purpose of instructional content was to change the learner’s cognitive, emotional, or physical status, while a content level analysis determined the optimal range of the sequence of learning required for achieving the instructional goal.

Phase 2 Setting instructional goals

Instructor needed to specify what the learners would be able to do when they completed the instruction. The goals should be clear, concise, complete and manageable.

2.1 Set instructional goal

The goals were about what the instructor planned to teach, what instructors covered in this course and how instructors covered it. These goals were usually broad, and at time vague depending on different learners.

2.2 Set learning goals

Learning goals describe what exactly instructors expect learners will learn. The goals involve enabling objectives and terminal objectives.

Phase 3 Design lesson

Instructor should outline how to reach the instructional goals. Attention should be given to the effectiveness of lesson elements and criteria for designing assessment.

3.1 Manage content

Authentic resources for the instruction were found in books. These were required to support instruction and learners.

3.2 Determine instructional strategies

Based on learning objectives, instructor was required to determine appropriate instructional strategies to maximize learning effectiveness. Based on the nature of listening comprehension and the features of listening instruction, the TIPs model focused on interactive instruction.

3.3 Establish tasks and assignments

The tasks in the TIPs lesson were designed according to the teacher’s competencies.

3.4 Design testing

Assessment used in the TIPs model. Instructor needed to create the criteria and format of testing. The assessment provided learners feedback and remediation when necessary.

Phase 4 produce TIPs Instructional package

Instructor decided what tools would be used as an instructional tools to deliver the lessons according to the learning context analysis which comprised the teaching, innovation, and profession.

4.1 Select Modules

Instructor modules or tools used to create a course and provide access control, according to the instructional goals, the modules including forum, task, project, and quiz could be chosen to deliver the instruction.

4.2 Integrate Media

Media for TIPs instruction comprised of text, graphic, audio, games, e-book, research, innovation, and internet access. All media was optimized to match minimum requirements of the available teacher competencies for the TIPs instruction and was delivered effectively for improving teacher’s competencies.



4.3 Model lesson

The TIPs lesson template was interactive and flexible. The prototype was formative evaluation to check whether it served the instructional goals.

Phase 5 Conduct developed lesson

Teaching process emphasized learner-centered learning and learning interaction.

5.1 Implement lesson

Lesson allowed learners to access contents, exercise and answer. Then, all lesson permitted one-to-one and one-to-many students access the lesson.

5.2 Encourage friend face-to-face interaction

Face-to-face interaction was managed in the TIPs model focusing on the learning process by encouraging interaction among students.

Phase 6 Evaluation

6.1 Conduct formative evaluation

Formative evaluation was presented in each stage of the TIPs module. It provided the information for ongoing improvement and adjustment.

6.2 Conduct summative evaluation

At the end of instruction, a summative post-test was used to collect data to access the effectiveness of the instruction.

In short, TIPs model was an instructional approach which designed to give a chance for students participatory in the lesson. The model consisted of the 6 phases and 17 steps which relied on interaction and student-centered. The TIPs model was emphasized on the real-world tasks.

4.2 The Results of the Experts' Evaluation of the Instructional model for TIPs Model

The researcher sent the TIPs model and the evaluation form to experts who evaluated the design, instructional system, and teaching field for evaluation. Descriptive statistics were used to calculate for arithmetic mean as shown in Table 1.

Table 1. The Results of Expert's Evaluation toward the Instructional model for TIPs model

No.	Statement	M	SD.
1	The components of the TIPs model are appropriate.	5.00	0.000
2	The steps in the TIPs model are clear and easy to implement	4.66	0.566
3	Each component in the model has appropriate connection	4.66	0.566
4	The TIPs model can help enhance learner-instructor interaction	4.65	0.000
5	The TIPs model can help learners-learner	5.00	0.000
6	The TIPs model can help enhance learner-content interaction	5.00	0.000
7	The TIPs model can provide the instructor or learner feedback immediately	5.00	0.000
8	The TIPs model has sufficient flexibility to be effective in teaching and learning in current instructional context	5.00	0.000
	Total	4.89	0.289

Table 1 revealed that 6 items received the highest mean score (M=5.00, SD=0.00) including item 1, item 4, item 5, item 6, item 7 and item 8. The finding indicated that the experts strongly agreed that



(1) The TIPs model was appropriate in the teaching competencies, (2) the TIPs model could help to enhance learner-instructor, learner-learner and learner-content interaction with task-based approach which created some innovation, (3) the TIPs model provided the instructor or learner immediate feedback via lesson learn, and (4) the TIPs model had sufficient flexibility to be effective in teaching and learning in current instructional content.

However, it should be noted that item 2 and item 3 received a mean scores of 4.66 (SD=0.566). This could be explained that the experts agreed that the steps in the TIPs model were clear and easy to implement and had appropriate connection, and each component in the model had appropriate connection. Overall, the TIPs model was rated by the experts at the mean score of 4.89 (SD=0.289) which indicated the model was appropriate and satisfactory.

4.3 The Results of the Effects of Using the TIPs Model

Tests were used to evaluate two classes of students’ achievement and compare student’s competencies before and after the treatment. The results were presented in Table 2.

Table 2. The Results of Students’ Achievement

Classes	N	Pre-test		Post-test	
		M	SD	M	SD
Experimental class	30	59.40	8.795	76.66	8.217
Control class	30	59.27	8.601	68.35	9.473

Table 2 showed that the experimental class average score of pre-test and post-test score were 59.40 (SD=8.795) and 59.27 (SD=8.601) respectively, while the control class’ average score of pre-test and post-test were 59.27 (SD=8.601) and 68.35 (SD=8.601) respectively. Clearly, no significance was found between the average score of two class’ pre-test ($p=0.891$, $p<0.05$) according to Independent-Sample T-test analysis of SPSS. The finding showed that the student teachers competencies in both classes were at the same level. After the intervention, both the experimental and control classes had higher mean scores but the experimental class was slightly higher than the control class. In order to examine whether there was a difference between the pair scores (Paired Differences) of experimental and control classes, pre-test and post-test scores of each class were compared by using a paired-samples T-test. The findings were presented in Table 3.

Table 3. The Results of Paired Samples T-test

Classes	Tests	Pair Differences				T	df	Sig (2-tailed)
		M	SD	95% Confidence Interval of the Difference				
				Lower	Upper			
Experimental Class	Pretest-Posttest	-16.27	4.533	-17.701	-15.716	-24.40	29	.000
Control Class	Pretest-Posttest	-7.18	4.221	-11.323	-8.792	-15.53	29	.000

Table 3 showed that both experimental and control classes had significant differences between the pre-test and post-test ($p=0.000$, $p<0.05$). Therefore, both classes of student teachers made a great progress in teacher competencies. However, in order to evaluate the effects of using the TIPs model, the post-test score of experimental and control classes were compared by using the analysis of covariance (ANOVA) model in SPSS. The results were presented in Table 4.



Table 4. The Results of a Comparison of the Post-Test Score for the Experimental and

Control classes

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6352.867	2	3631.878	167.251	0.000
Intercept	557.813	1	569.804	32.186	0.000
Pretest	4407.762	1	4406.782	254.703	0.000
Classes	1704.512	1	1704.512	91.422	0.000
Error	1742.626	89	20.707		
Total	462520.000	92			
Corrected Total	9214.624	91			

Table 4 presented that there was a significant difference in the post score between the experimental and control classes ($p=0.000$, $p<0.05$). The finding showed that the students of experimental class who had been instructed in the TIPs model which made more demonstrable progress than those of control class. Hence, the TIPs approach which using the lesson appeared to support learners to learn more effectively as well as develop their teacher’s competencies and ability as expected.

Conclusion and Future work

The study has been conducted in order to solve and develop the teachers’ competencies, and to establish a TIPs model and deliver instruction via lesson. The objectives of this study were to develop the instructional approach based on Model of the Development of the Teachers’ Competencies for Thailand 4.0 for student teachers at Suan Dusit University. The finding revealed that the TIPs approach was suitable to teach student teachers with activities, tasks, quiz, and presentation some assignments, the relationships between teachers and learners that the finding of the study related to Puangtong (2014) that the instructional model could help students to create knowledge by using tasks and some activities. The TIPs model had suited to apply in the graduate diploma program in teaching profession because the results showed that it had high mean score of the experimental group, and the TIPs model could support student teachers to create some good assignments. Similarly to Nyshanova, Baimukhanbatov, Abdigapharova, and Mukhamedzhanov (2014), it was found that developing future teachers could create abilities of teachers’ competencies. Although the development of the TIPs model might offer practical solutions for the development of the Instruction Model based on the Development of the Teachers’ Competencies for Thailand 4.0, it needs to conduct further research. Hence, the next research should focus on applying the hypothesis in the other subjects, such as practicum, internship 1 and 2 for practical teaching in real-world.

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Preliminary Findings on Educational Choices of Language Loyalty and Belonging among Nanyu Youths

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ABSTRACT

The subject matter of this paper briefly addressed how the role educational choices had impact on sense of Patani Malay sense of belonging among male and female Malay students from urban and rural communities. What was their strength of belonging to Buddhist-dominated Thailand? What was the degree of comfort that young Nanyu people feel towards the State? This brief ethnographically-focused paper revealed that social cohesion to the Thai concept of belonging among Malay young people educated in Thai public schools and especially those servicing urban communities is higher than graduates of either Private Islamic Schools or Traditional Pondok schools. Equally important, Patani Melayu (hereby referred to as Nanyu) young people who did not educate in Thai public schools expressed a sense of discomfort, and alienation from the Thai State. This paper therefore explored the gendered interplay between education and language loyalty, and the impact on social cohesion or alienation in multilingual South Thailand.

INTRODUCTION

The subject matter of this paper briefly addressed how the role educational choices had impact on sense of Patani Malay sense of belonging among male and female Malay students from urban and rural communities. What was their strength of belonging to Buddhist-dominated Thailand? What was the degree of comfort that young Nanyu people felt towards the state? This brief ethnographically-focused paper revealed that social cohesion to the Thai concept of belonging among Malay young people who educated in Thai public schools and especially those servicing urban communities, was higher than graduates from either Private Islamic Schools or Traditional Pondok Schools. Equally important, Patani Melayu (hereby referred to as ‘Nanyu’) young people who did not educate in Thai national schools expressed a sense of discomfort, and alienation from the Thai state. This paper therefore explored the gendered interplay between education and language loyalty, and the impact on social cohesion or alienation in multilingual South Thailand.

The conflict in the southernmost provinces of Thailand that had emerged above ground since 2004 resulted in over 6,000 deaths. The incorporation of the southernmost provinces of Thailand bordering Malaysia stated that stemmed historically from the administrative reform of 1902 gave rise to the struggle of resistance to the Integrative Revolution like those usually faced by New States (Geertz, 1963). Despite their incorporation, the Patani Melayu Muslims had been rather insulated by the state bureaucracy of the Buddhist nation due to the differences of religion, linguistic and cultural characteristics (Pitsuwan, 1982). Since the region was formally annexed by Siam, there were various policies implemented in an attempt to suppress their distinctive ethnic identity in order to assimilate the local population into the Thai nation (Nilsen, 2012). Therefore, the local Patani Melayu population were consistently obliged to adhere to the overall ideology of Thainess resulting in the increased sense of alienation. Various studies conducted by Che Man (1990) and Thanet (2007) concluded that a majority of the local people felt they were being treated as second-class citizens and that their interests had been neglected (ibid).

Besides the historical injustices conducted by the state through the policies of assimilation, lying the fundamental issue at hand which this paper aimed to address was the overall nature of the Thai Buddhist State and its conflicting nature with the traditional Islamic society that was alienated from the mainstream. Even though there was the presence of a heterogeneous character of Muslim communities throughout



Thailand, the differences marked upon the ethno-religious terrain found a point of departure between the rest of Thailand and the region that constitutes as the Deep South. Hence, this conflict was unexplored dichotomy brought forth questions of the legitimacy of the Thai state from the point of view of local Nayus (Patani Melayu Muslims). As explored by Pitsuwan (1982), the differences of perception of the role of the religious leadership in the state, the ultimate origin of law, and the role of authority of the state in the affairs of religious hierarchies in the Buddhist and Islamic societies all played a role as fundamental reasons for the political conflict in the Deep South. Pitsuwan (1982) argues that the building blocks overlooked in examining the conflict are the progression of change in the realm of law and state authority since the incorporation of the Greater Patani region into the authority of the Thai state, as presented clearly below:

In Islam, the religious leadership serves to remind the state or the secular authority to keep on the righteous path. But in Theravada Buddhist society of Thailand, the state, and the kingship in particular, have the royal responsibility to keep the religion(s) purified and protected from internal corruption. In the process, the state or the secular power, gains control over the religious hierarchy and wins its support and approval.

(Pitsuwan, 1982, p. 12)

The Thai State firmly believes in the same way that it succeeded in its appropriation of the Buddhist religious leadership, as they institutionalized Theravada Buddhism during the Fourth Reign, it would also be able to bring forth similar success with Islamic leadership. Hence, the provincial Islamic councils have to be approved by the Ministry of Interior, and traditional institutions of learning (*pondoks*) have to be converted into the semi-secular “private schools for Islamic Education” (ibid). Pitsuwan (1982) clearly expressed this problematic situation by stating that “if the Thai state is the manifestation of the Buddhist cosmology, the Patani Melayu Muslims do not want to be a part of it (ibid)”. It is clear from the earliest date of incorporation that the symbiotic relationship between the secular power (the Thai state) and the Buddhist ecclesiastical hierarchy was problematic when it extended its power to the divorced domain of the Patani Melayu Muslims down south (Tambiah, 1978).

The political history of Patani since the final incorporation in 1902 had never been peaceful. Yet, the process had been filled with rebellions and protests both by intra-groups of the minority elites (former family members of the Sultanate) as well as from the mass Patani Melayu citizens in opposition to the mistreatment of the local population by the state. Furthermore, it became clear that the Legitimacy of the Thai state is one of the key concepts that must be explored in order to understand the conflict as a whole. As argued by Sascha Helbardt (2011), when the state was known for its power abuses in the past, it lost the trust from the local society. Despite the fact that there were various contending root causes of the conflict, the deeper cultural roots that deal with issues beyond socio-economic reasons remained unexplored. However, another dimension that had been left unexamined was the subject of local perceptions of the Patani Melayu population and their views towards the Thai State and the conflict itself.

Furthermore, if deep root causes, such as identity, ethnicity, religion, and history that made up the pillars of Patani Malay nationalism. They were not addressed or examined thoroughly, and were overlooked in favour of other factors that were essentially not fundamental as to why the conflict was occurring (from current academic claimed that the conflict was a result of socio-economic grievances, or simply resulting from the acts of terrorist/separatist groups to its linkages of the Jihadist movement), all attempted to understand that the conflict would be futile.



OVERVIEW

The region of Patani after incorporation into Siam in 1909 was eventually broken down into three provinces after undergoing different stages of nation building during the period of Siamese modernization. Contrary to popular beliefs, low level separatist violence has continuously occurred within the incorporated Malay Patani regions throughout the three southernmost provinces of Thailand which consisted of Pattani, Yala and Narathiwat along with four districts in southeastern Songkhla province comprising of Chana, Na Thawi, Saba Yoi and Thepa. Demographic statistics that were available for the specific areas of the research ranged from 1.8 to 2 million people, of whom more than 1.5 million who were identified as ethnic Malays that profess the Islamic faith (Liow, 2016). The Official Statistics Registration Systems under the management of the Department of Provincial Administration revealed that there were approximately 511,785 young people between the ages of 16 to 30 years old living in the region.

According to these approximate demographic values according to National Populations Statistics in 2015, the population of young people between the ages of 16 to 30 years old constituted roughly 30 percent of the total population (based on the estimate of 1.9 million). As the majority of the population profess the Islamic faith as Sunni Muslims under practices of the *Shāfiʿī* (Arabic: شافعي) school (Arabic: madhab), it was usual to find large size families especially in the rural areas of the region. Thus, unlike the population trend of the country as a whole, the demographic trend in the region of Patani was substantially different in terms of age structure. The Patani Malay society could be regarded as traditional with members of the population demonstrating piety with adherence to religious Islamic doctrines and practices shaping precise dimensions of life for the individual from birth until death. An evaluation of the demographics trend specific to the region would reflect an expansive population pyramid structure with a proportionately larger percentage of the populations within the younger age ranges in comparison to the rest of the country.

As the research focuses on youths, this paper is centred on the lived experiences of these youths in the varied educational institutions and out of school youths who had grown up within the dynamics of the conflict in both urban and rural areas of Pattani, Yala and Narathiwat provinces. Ethnography particularly conducted in a conflict zone was rendered challenging with many obstacles of threats and possible violence towards the researcher and or their informants. However, it was important to conduct such research as it allowed for further depth in terms of understanding the nuances of perceptions particularly on belonging and nationalism that required respondents to be significantly self-reflective in terms of answering questions about who they are who they identified as, or to address their sense of belonging to be made, especially when attempted to explain the overall situation in the past were often presented in simplified ways.

Historical Trajectories of Educational Institutions Terrain in the Deep South

The first formal educational institution in the region was introduced in form of a *Ponoh* (Malay: pondok) which literally meant hut or cottage. In the past, Islamic scholars who had acquired Islamic knowledge either under Islamic scholars from Mecca and beyond returned back to Patani and established these forms of Learning Circles. *Tok Pakej* (EN: Ponoh students) lived on school grounds by building their own *Ponoh* and attended Islamic classes on the *balai* at the main *Ponoh* belonging to the *Babo* (EN: the main Islamic teacher within the ponoh). Pondok education centres on the knowledge provided by the *Babo*, who often referred to classical Malay religious literature that was written in Jawi script by Patani scholars, known as *Kitab Kuning* or *Kitab Jawi*. Scholarship entailed all aspects of Islamic teachings from instruction of *fiqh* (jurisprudence), *aqidah* (theology), *tassawuf* (spirituality) and *ethics*. Therefore, the first schooling system in Patani was intrinsically interlinked with the foundation and transmission of Islamic principles and values, especially after the hardship that the society as a whole endured from the previous ‘*Warring Years*’ with Ayutthaya. Nevertheless, one claimed of Patani’s distinctiveness lied fundamentally in the historical establishment of the Pondok in the flourishing years during the fifteenth and eighteenth centuries, where the Kingdom of



Patani (also known as Patani Darussalam) became a major center for Islamic education in Southeast Asia. The quality of Islamic education that was provided throughout Patani through Pondok schools drew in students from all over Asia, and for that very reason Patani was described as ‘the cradle of Islam in Southeast Asia’ (Liow, 2009:19).

When Siam proceeded into the process of modernization and bureaucratization through the use of military force and administrative centralization, it began to consolidate States in the outer peripheries (ibid) including that of Patani. Efforts of transforming the scattered principalities into a Westernised notion of a nation state took shape in the establishment of a centralised and modern educational system, by which had the underlying agenda in integrating and assimilating ethnic minorities into a ‘coherent Siamese national identity’ (ibid). Sentiments of resistance were strong throughout Patani as religious leaders, teachers and locals perceived that such policies were a threat to their ethno-cultural and religious identity. An excerpt from Raymond Scupin (1989) one of the earlier contemporary scholars on Patani described this perceived threat wholesomely:

[...] they (the changes) created fundamental dilemmas for the Malay Muslims of this southern region. The Thai compulsory education system was based upon the Thai language, a language foreign to most of the Malay Muslims of the South and upon Buddhist values, which were intimately associated with a traditional monastic curriculum developed by the Buddhist Sangha. Therefore, in the eyes of many Muslims in these southern provinces to become involved as a citizen participating in the Thai polity necessitated a rejection of one’s language and religion.

Although there had been several changes made to Thai State (public schools) educational system in the region since the early 1920s, there was still this engrained popular belief that these ‘*Siyae* (Siamese) schools were a medium to which would realise the government-sanctioned attempted to assimilate the local population. Thus, it did not come as a surprise that these national schools were viewed with suspicion. In a personal interview conducted with Hafiz, a *tok pakej* from a traditional Pondok on the outskirts of Pattani province, he explained how such beliefs were particularly common in the *kampung* (villages) among the older generations:

It is not strange [if they] don’t send their children to Thai State schools (national schools). Before they were all forced to attend Thai State schools at the primary-elementary level, so it’s not as though they have not experienced it [...] they know it does not cover what is essential for them, they want their children not just to have knowledge about how to go about in this world but also the hereafter.

Past experiences that are often recollected and retold adds to the narrative of ‘gaps’ in terms of local acceptance and understanding that still exists in institutions which are regarded as State schools.

Stories were often shared. Sometimes at home, sometimes with friends in a teashop, mostly told through older friends that shared their experiences of when they attended Thai State elementary schools, especially those ones in the city centres like Pattani or Yala. They faced with so much obstacles, some were disheartening and deep. A close friend of mine once took me back to the school and showed me where he had to hide every lunch time, because *Siyae* (Thai Buddhist) friends would put pork on his lunch. He recalled that there were times he would not have lunch because his food was touched by pork but what was worst is none of the teacher helped him out. Some other people had other experiences with teachers in Thai national schools. Some *Siyae* teachers also fined students money for speaking in *Melayu*. They fined the student per word. It’s harsh, and it’s forces deep rooted anti-*Siyae* sentiments.



Such experiences since the introduction of the 1921 Compulsory Education Act has generated many narratives such as the ones expressed by Hafiz, which had resulted in a negative outlook towards national schools throughout the region – with the highest rates of public schools having less and less student enrolment annually. Nevertheless, some of the educational choices made were at times interlinked with religious beliefs as well – whereby some locals went as far as to say that ‘it is a sin to send their children to Thai schools...’ Dynamics of national schools in the urban centres and the rural areas were also drastically different, whilst maintaining some similarities. Similarities often lied in the stance that public schools were often attended by children with family members working as civil servants or bureaucrats. There was often a clear pattern in terms of Nanyu students attending national schools in urban vicinities, who came from what might constitute as the upper middle and upper class of the Nanyu community. Nevertheless, this particular group of Nanyu youths made up a minority in comparison to the rest of the Nanyu youth population who found themselves enrolled in an alternative type of educational system called a *madrasah* or a private Islamic school.

The emergence of the *madrasah* educational system developed from a series of socio-political changes that Patani as a whole faced with after formal colonisation. As explained earlier, as a response to their own failure in the implementation of the government-school integration project in the Deep South, Bangkok contemplated the blanket closure of the Pondok (Liow, 2009). Although this response had to be fully realised, measures were implemented to make it difficult for the Pondok to exist as an institutional entity on its own. As documented by Liow (2009), a calibrated approach used to regulate knowledge that had corrosive impact on center-periphery relations began in the early 1920s, by easing Thai language instructions and materials into the Pondok through Thai teachers. However, as such texts were viewed by locals as an initiative to impose Thai values in a way that threatened their local culture, religion and heritage resistance was also widespread (Liow, 2009). It was in 1958 that the Ministry of Education began the policy of Pondok registration which had two main agendas: first, as an officially recognised channel to integrate Pondok graduates (who at that time were not recognised as ‘graduates in their own rights’ - as Pondok were not viewed as educational institutions by the State but as religious institutions) into the mainstream economy (ibid). Second, being that they wanted to regulate, and monitor the knowledge that was being disseminated within the Pondok education as well as the narratives of Patani Melayu nationalism that promoted resistance and independence. The historically rooted problems of regulation in terms of bringing the Thai State into the Pondok space is still evident today in a personal interview with Abdul, a young *tok pakej* turned *tok guru* in a traditional Pondok in Thung Yang Daeng, who described the persisting problems with ‘*external Thai teachers*’ who were sent from the Centres on a weekly basis to teach Kor Sor Nor subjects; without understanding the rules and values of the educational institution:

It’s almost as though their policies of assimilation have changed. Before it was more direct during the harsher period of assimilation, we weren’t allowed to do certain things that are required in our beliefs and which are clearly stated in our religion. But at present they allow us to do what we want. If we wanted to go to a Pondok, and study only religion we could. But they [the security personnel] still come into our Pondok whenever they want. They send in Kor Sor Nor teachers who doesn’t care to learn anything about our customs, or traditions, some of whom dresses inappropriately to come teach these religious students. In a way, it’s an direct way to slowly ruin our ways within the very institutions which are the pillars of what makes Patani different from any other places in Thailand.

By 1960s, the policy of registration began to take off under the centralised flagship of modernisation and development projects. The Pondok Educational Improvement Programme (PEIP) codified the improvements of the curriculum and pedagogy of Islamic education with suggestions made by the Ministry of Education (Liow, 2009: 27). Through the PEIP, traditional pondoks that originally taught Islamic studies in their own ways under the role of the *babo* and *tok guru*, were persuaded to register in exchange for financial support



and to introduce academic and vocational subjects taught in Thai (ibid). By the final year of registration more than 400 pondok had registered and were classified as private Islamic school institutions; whilst another 100 pondoks closed down or went underground to protest the reforms (Liow, 2009:28). It is clear that the policy has allowed State regulation to enter into and to some extents take control over the pondok, as it has in due process ensured that they adopted a national Thai curriculum with aspects of secularism and Thai culture into a socio-political and religious educational space that was previously well protected.

As alluded earlier, given the socio-political changes that have developed through periodical waves of ease and tension between the centre-periphery relations, the development of private Islamic schools (hereby known as madrasah) were progressively realised. At present, they are the most popular type of educational institution with the highest numbers of enrolments comparatively for middle school and high school level education. Madrasahs in Patani integrate religious curriculum and academic-vocational curriculums as well as informal Learning Circles which would take place in the evenings. Whilst the main language of instruction for academic-vocational curriculums is conducted in Thai, students still mainly communicate to one another in Patani Malay dialect. In many regards, language loyalty and use within all these various institutions could be considered as a hindrance in the development of skills set for students to compete with other students on a national basis. However, in a discussion about language loyalty and use with Ireena, a student at one of the largest madrasah in southern Thailand, she drew on an interesting outlook on the matter in relate to the nationally enforced curriculum:

It is definitely difficult for us to compete with other Thais on the national examinations because Thai language isn't our mother tongue. For the most of us, I mean. I understand that our main dialect 'Taning Nanyu' is not standardised and is not a language in itself, but it would make more sense if the Thai government helped develop our skills to formally learn 'Bahasa Melayu' in our curriculum, at least the ease of transition would be easier. The situation we're in is discerning. We're not able to communicate fluently in Thai nor are we able in Bahasa Melayu. What we have is a mixed of broken Thai and local Patani Melayu dialect, that can only be understood here, or at most, in the bordering states of Malaysia.

Language Use and Belonging

Throughout the fieldwork, it has been clear that language is one of the salient markers of identity that must be explored in depth as it is the main instrument of social interaction that not only provides a sense of a collective group identity but also shapes an individual's perception of their local realities as well. Anderson (1983) and Hobsbawn (1990) assert that language is one of the main symbolic instruments that create uniformity in terms of the imagined collectiveness of modern day nation state.

The sociolinguistic approach of Ferdinand de Saussure deconstructs the role of language as a tool that determines the power relation between social groups, both in the horizontal and vertical sense, in the environs of modern nation states. There is a vast amount of literature that discusses the roles that language plays from the processes of inclusion and exclusion as well as its ability to create social distinction (Bourdieu 1991; Foucault 1980). More recent scholars like Heller (2011) also provided research into the use of some language to reproduce social inequalities among various ethnic groups within the nation. In the case of Patani, language differences had always been the greatest challenges as well as a source of contention. In Bourdieu's (1990) explanation of language as linguistic capital, through the imposition of a standardized national language, all the bureaucratic institutions would reproduce the aims of the state by using a single language as means of communication. Inevitably, this process legitimates the use of a dominant language, and demarcates the point of entry into the linguistic community (Bourdieu, 1991). Thus, those who do not speak the dominant language would not be able to gain membership into the collective community.



The demands to use Malay as an optional language in schooling system dated back to the 1940s, but the National Reconciliation Commission recognized the demands only in 2005 and yet they remained largely unimplemented due to the opposition of school teachers who did not speak Malay. Such policies along with the resistance of the Nayus to assimilate created a vicious cycle endowed with poverty and lack of improvements for the livelihoods as positions of power in governmental jobs remained occupied by the minority of Buddhist Thais, despite the majority representation of Nayus in the region. While the use of the Thai language was on the rise among the ethnic minority, the balancing between mastering Thai and the preservation of the Melayu dialect had created a web of disadvantages to them as a social group as they were unable to compete with ‘the others’ in “politics, education or even white-collar professions. Evidently, the reality of the Nayu situation is a reflection of Bourdieu’s (1991) proposition that linguistic capital can be transferred to other forms of capital (for instance, economic capital), because it ultimately affects the individual’s position in the social space. In order to prevent total alienation from the dominant group, a majority of Nayu youths are now learning Thai in order to move up from their subordinate position in the hierarchy of social space.

Furthermore, Bourdieu (1998) also addresses the relation between language and power. It is important to recognize the symbolic power that language wields as an instrument of constructing identity. Symbolic power is described as,

A power of constituting the given through utterances, of making people see and believe, of confirming or transforming the vision of the world, and thereby action on the world and thus, the world itself.

(Bourdieu, 1998:170)

In his explanation, language goes beyond its function as a tool of verbal communication and through its symbolic power, it has the ability to affect the individual’s perception of their reality as well, in turn shaping their identity. In order to understand the emergence of the hybridized identities in the Patani region, language (both the local dialect and Thai) as an identity marker and its uses in the private and public spheres must be considered in order to fully conceptualize the local perceptions of the state and the conflict itself.

Sense of Belonging and Citizenship of Patani Melayu Muslims as Thai Citizens but not Thai People

McCargo (2011) was one of the first scholars to introduce the concept of ‘formal and informal citizenship’ in his analysis of Thailand’s southern conflict. He posited that despite being Thai nationals under the legal concepts of citizenship, Patani Melayu Muslims did not meet the informally understood criteria for full formal Thai citizenship (McCargo, 2011). Arguably, the heart of the Southern violence rested on the idea of citizenship and concepts of identity. Nayus had full Thai citizenship in the formal sense, as described by Marshall’s three-core classification of citizenship consisting of civil, political and social rights (Marshall, 1950). Furthermore, Bryan Turner (2001) argued that Marshall’s view on citizenship stemmed from the understanding of a relatively homogenous society but failed to address the complexity of a modern state characterized by ethnic divisions (Turner, 2001). Thus, the concept of formal citizenship articulated by Marshall fails to adequately explain the realities of countries such as Thailand as it did not capture the relationship between the state and the individual (McCargo, 2011).

While the debate on citizenship in non-western countries addresses questions concerning the rights to have rights, and notions of inclusive citizenship (Kabeer, 2005) other authors have argued that ethnic and social diversity should be acknowledged as a form of differentiated citizenship (Young, 1989) by calling for special treatment for marginalized groups. The case of the Nayus reflects a reality that has not been explored in the literature on citizenship. According to McCargo, as most literature assumed that minority groups would like to exercise full citizenship rights, the Nayus felt reluctant to participate in the broader society that they felt alienated from (ibid). A reflection of the identity cleavage between the Thai Buddhists and the Nayus was evident in the use of language as it was through linguistic devices that the Nayus identify themselves



differently from the rest of the Buddhist Thai population. The use of language as identity marker was evidently reflected in the National Reconciliation Commission as they noted that:

When the villagers in the area are asked who they are, the answer they give is “*Melayu*” which means “ethnic Malay of Islamic faith.” Some identify themselves as an “Islamic person” in a voice that shows their pride and their religious devoutness. Some reply that they are “*orang nayu*” (a Malay) but not “*orang siyae*” (a Siamese/Thai). It is possible that they are afraid of saying “a Thai” because the understanding is that by “being a Thai”- meant being “Buddhists.”

There were claims made by Thai Buddhists residing in the three provinces that the Nayu community was “disloyal to the Thai state” as it was a general perception of the Thai Buddhists that the rule from Bangkok was one that was positive and that it had given the Nayus’ benefits as Thai citizens. For the Nayus, the discourses of ‘us’ and ‘them’ were derived from the treatment and attitudes by the Buddhist. Thais resulted in them delineating their religious and cultural space, seeking to curtail what they see as intrusions of the Bangkok Buddhist nation state (McCargo, 2011). In Thailand, there was no policy of differentiated citizenship that gives privileges to ethnic minorities. However, in practice as discussed throughout the paper, Thailand was characterized by sharply differentiated modes of informal citizenship that privilege certain groups (ibid). In the process of nation building, the predominant discourse of ‘Thainess’ and the determination of the nation-building elite to suppress all notions of ethnic differences had placed ethnic minorities in an uncomfortable position within modern day Thailand (Conners, 2007; McCargo, 2011). Inevitably this had led most of the ethnic groups, such as Lao Chinese, Lanna (Northern Thai/Lao), Mon, Vietnamese, and Khmer to passively subsume their culture and identity to Thainess (ibid.). Overall, the process of assimilation reflected the nation’s principle of unity in similarity in the construction of an identity by the role of the state. In order to understand the social and power relations in Thailand, one must move beyond legal notions to engage with more complexes, ambiguous and non-formal realities (McCargo, 2012). Thus, it involved critically departing from the legalistic understanding of citizenship to addressing what he called informal citizenship. It was argued that being a citizen in Thailand is not an either/or matter but a question of degree (ibid).

Citizenship has multiple dimensions. In Thailand, full citizenship contains informal elements that are unspoken (McCargo, 2011). These informal elements are the shared notions of Thainess as discussed. To have formal Thai citizenship means more than holding a Thai nationality but to fully embrace Thainess. In essence, Winichakul (1994) rightfully concluded that Thainess trumps Thai nationality (Thongchai, 1994) as the adherence to the holy trinity of ‘Nation, Religion, and King’ must be made on behalf of the individual. McCargo goes as far as to suggest that the unquestioning loyalty to the monarchy is a difficult proposition for the Patani Melayu Muslims as they had their local Patani kings (and queen) and while most accept the Thai monarchy, few look upon it with unalloyed warmth (ibid). Furthermore, another significant characteristic of Thainess that one must possess is to have Thai as their mother tongue. While most Patani Melayu Muslims, under the age of forty, are able to speak Thai, for a majority, Thai remains a second language that is acquired for pragmatic purpose but not a core element of their identity (Madmarn, 1999; McCargo, 2011).

The unwillingness of the Thais to grant ‘Nayu-ness/Malay-ness’ as a status of a distinct identity is primordial due to the perception that the Thai Buddhist community harbors for the Patani Melayu ethnic minority as well as the degree of separation which is compounded by the location of Pattani, Yala, and Narathiwat at the southern extremity of Thailand (McCargo, 2011). As a result, most Thais do not have any reasons to travel to the three southernmost provinces. The distinction made by Suhrke (1975) allows us to see how Thais tend to classify groups of Patani Melayu Muslims in two distinctive groups as loyalists and separatists. The loyalist groups of Muslims are happy with the virtuous Thai rule, and are loyal to the benevolence of the monarchy, the bureaucracy and security forces whereas the separatists are all of those Muslims that demand decentralization, devolution, autonomy or outright independence regardless of the fact that these demands extensively differ from one to another (ibid).



In order to understand the perceptions of Nayus on their sense of belonging and identity within the Thai State understanding must be forged through understanding the historical trajectories of the social group as a whole. Since time of the incorporation it is evident that Nayu have been construed as subjects rather than citizens. Their unwillingness to subsume their ethnicity, language and religious identity to the narrative of Thainess is the main site of resistance of Bangkok’s authority. Cornish (1997) and (McCargo, 2011) argues that as a result of this unwillingness to embrace wider social norms, the Patani Melayu Muslims are left with an empty choice between separatism and loyalty – which for most have no meaning. However, as reflected in reality, for a minority to assert its distinctive identity is to demonstrate disloyalty and is a prelude to over rebellion (McCargo, 2011). In effect, from the case of the Patani Melayu Muslims, it is clear that Thai citizenship means the acceptance of Thainess determined by the Thai state that does not take into consideration any rights of active political participation of self-proclaimed minorities. Moreover, the particular case of Patani Nayu highlights the inadequacy of the literature on citizenship as Sassen (2006) asserts that there must be a deeper understanding of both formal and informal citizenship (Sassen, 2006). Thus, the concept of citizenship must be put into consideration in order to analyze how ethnic and religious minorities negotiate their relationship with the state.

Conclusion: Politics of Categorization: Contested Notions of Identities as a By-Product of Ideology

“Are you *khon* (a person of...) Islam or Thai?” This common question was asked frequently in various contexts throughout the region. Be it, the market square in *hulu* (EN: hinterlands) of the famous town known to the locals as *Jaba* or nationally as *Rueso* district by older *ayuh* (EN: aunty) selling fresh fish in the marketplace to younger *adiks* (EN: younger sisters), aged not much older than thirteen standing around with the members of her *tadika* class on a Saturday excursion to *Talok Kapo* beach in Yaring District, Pattani. The distinction between the two concepts of Islam and Malay (PM: Nayu) identity is synonymous whereas the ‘Other-ing’ notion being categorized as Thai that is, on the other hand, associated to being Buddhist. In the past three decades the local understanding and the use of the term Melayu as a classification of ethnicity had shifted drastically. The politicization of the use of the term *Nayu or Melayu* has limited the scope of its definition as a reference to the ethnic group that is predominantly Muslim whose members were an integral part of the Malay world or global *ummah*. The politics of categorization was apparent in the everyday realities of individuals in the south border region of Thailand. Not only was visible, it provided a rich insight into understanding the “Us and Them” narrative that is embedded in everyday language use. The Thai state refers to all subjects within the territorial boundaries as Thai and to Muslims as *Thai Islam* or *Thai Muslims*.

Furthermore, it is also important to explain that at present the two communities of Thai Buddhists and Patani Malays despite living in close proximity, it has very limited inter-group interactions that are often shadowed with public displays of mistrust and/or at times upfront avoidance. Gap, a twenty four years old student- Chinese born Thai in Pattani province explained that throughout his childhood he was always told by the elders not to mingle with the *khon Islam* (EN: Muslim people) and when asked why, his explanation was simple: his family with well established businesses in the province, had never trusted the locals who were Muslims ever since they migrated down from Samut Sakhon, two generations ago.

This very notion of non-interaction between the two groups, despite being put forth as a general example, allows one to understand how forms of identification are being emphasized and used as a powerful tool in their daily life in reasserting their sense of belonging . In other words, the non or limited interaction creates a collective imagined border in the minds of the people; both amidst the minds of the Thai Buddhists and Patani Malays, that their self-perception is often in opposition to what they identify as the others. The terms used to connote the others (*puak khao/puak mun/puak khon Islam*) can easily be heard in conversations with



groups of local Thai Buddhists living in the urban area of Pattani city, whereas, the literal term “*orang Siyae*” (EN. Siamese/Thai person) is most commonly heard in Muslim intra-group conversations when a stranger enters into the vicinity.

In conclusion, the divides resonated between the perceptions of students within different educational institutions are coherent. The fundamental differences may stem from various backgrounds, yet the fundamental differences lies in the historically rooted trajectories that makes up the building blocks of one’s sense of belonging; albeit within the ideologies of marked differences within sense of historical roots, ethnicity, language loyalty or religious beliefs. When such fundamental differences are not acknowledged fairly in a ‘multi-cultural’ State which embraces plurality; it may simultaneously encourage other venues to be utilised in order to cry for recognition and pride in the very sense of who they are.

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The Study of Linguistic Repertoire and Language Attitudes of Thai Soeng Dam Ban Talat Khwaaj, ChomBueng District, Ratchaburi Province

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ABSTRACT

The study of linguistic repertoire and language attitudes of Thai Soeng Dam Ban Talat Khwaaj, ChomBueng District, Ratchaburi Province aimed to to evaluate Thai Soeng Dam Linguistic Repertoire as well as to investigate language attitudes of Thai Soeng Dam people. This study focused on linguistic background, ability of the Thai Soeng Dam people to understand and speak Thai Soeng Dam, Lao, Isan, and Central Thai as well as the language attitudes of the Thai Soeng Dam people toward their own dialect and their own ethnic group. The data was collected using the individual questionnaire consisted of four parts including (1) Language Use Profile, (2) Linguistic Repertoire, (3) Personal Language Use, and (4) Language Attitude. The variables or the factors used in data analysis were sex, age, education and place of birth.

Linguistic Repertoire of most Thai Soeng Dam Ban Talat Khwaaj, ChomBueng District, Ratchaburi Province referred to two languages which were L1: Thai Soeng Dam and L2: Central Thai. Moreover, some Thai Soeng Dam could speak five languages including L1: Thai Soeng Dam, L2: Lao, L3: Central Thai, L4: Isan, and L5: Yuan. Additionally, for the mother tongue of the elder Thai Soeng Dam, it was found that they could speak three languages which were Thai Soeng Dam, Lao, and Central Thai. Moreover, for the younger Thai Soeng Dam, it demonstrated that they could speak four languages including Thai Soeng Dam, Lao, Central Thai, and Isan. General attitudes towards the Thai Soeng Dam language showed that the language was mostly accepted. According to interview, they were proud to be Thai Soeng Dam and they would like every Thai Soeng Dam speak Thai Soeng Dam language more. In conclusion, Thai Soeng Dam language is important in their community especially to be accepted in the community and to live in the village.

Keywords: *Thai Soeng Dam, Linguistic Repertoire, Language Attitudes, Ratchaburi*



INTRODUCTION

Ratchaburi is another community with diversity both in terms of history and ethnic from the past to the present. The very interesting thing of this area is that people in different ethnics are able to adjust themselves to each other harmoniously. Some research indicated that there were eight ethnic groups in Ratchaburi including Chinese, Mon, Local Thai People, Thai Dam or Thai Soeng Dam, Lao-Wiang, Yuan or Thai Yuan, Karen, and Khmer Lao Derm. This study aimed to investigate the linguistic repertoire and language attitudes of Thai Soeng Dam Ban Talat Khwaaj, ChomBueng District, Ratchaburi Province. Thai Soeng Dam in Ratchaburi migrated from Petchaburi and Nakorn Pathom provinces. Originally, they came from Điện Biên Phủ and other places of the Republic of Vietnam near the territory of Laos.

Most of them live in Ban Talat Khwaaj, Chom Bueng District, Ban Wang Pla in Kaem Aon sub district, Ban Don Khleng, Ban Bua Ngam in Damnoen Sabuak District Ban Don kha, of Bang Phae District and Ban Hua Khao Chin at Tambon Hauay Yangthon of Pakthor district.

Objectives

1. To evaluate the Thai Soeng Dam linguistic repertoire.
2. To investigate language attitudes of Thai Soeng Dam people.

RESEARCH SCOPE

1. Population: Twenty persons of Thai Soeng Dam people from Ban Talat Khwaaj, ChomBueng District, Ratchaburi Province.
2. Variable: 4 Variables including Sex, Age, Education, and Place of birth.

RESEARCH METHODOLOGY

1. Data collection: Data was collected from twenty persons of Thai Soeng Dam people at Ban Talat Khwaaj, ChomBueng District, Ratchaburi Province.
2. Tools used for data collection: Individual questionnaire consisted of four parts including
 - 2.1 Language Use Profile for 15 questions;
 - 2.2 Linguistic Repertoire for 5 questions;
 - 2.3 Personal Language Use for 13 questions;
 - 2.4 Language Attitude Profile for 5 sub-parts.

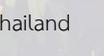
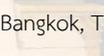
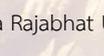
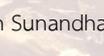
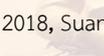
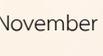
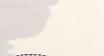
Table 1: The Classification of Thai Soeng Dam Informants

No.	Sex	Age	Education	Place of birth
1	Male	More than 61 years old	Primary School	Ban Talat Khwaaj, ChomBueng District
2	Female	41-60 years old	Primary School	Ban Talat Khwaaj, ChomBueng District
3	Female	41-60 years old	Secondary School	Ban Talat Khwaaj, ChomBueng District
4	Female	More than 61 years old	Primary School	Ban Talat Khwaaj, ChomBueng District



No.	Sex	Age	Education	Place of birth
5	Female	More than 61 years old	Primary School	Ban Talat Khwaaj, ChomBueng District
6	Male	21-40 years old	Bachelor Degree (B.A.)	Ban Chat Paa Waaj, Suan Phung District
7	Male	More than 61 years old	Primary School	Ban Talat Khwaaj, ChomBueng District
8	Male	41-60 years old	Secondary School	Ban Talat Khwaaj, ChomBueng District
9	Female	41-60 years old	Primary School	Ban Talat Khwaaj, ChomBueng District
10	Female	13-20 years old	Secondary School	Ban Talat Khwaaj, ChomBueng District
11	Female	13-20 years old	Secondary School	Ban Talat Khwaaj, ChomBueng District
12	Female	13-20 years old	Primary School	Ban Talat Khwaaj, ChomBueng District
13	Female	41-60 years old	Secondary School	Ban Talat Khwaaj, ChomBueng District
14	Female	More than 61 years old	Primary School	Ban Talat Khwaaj, ChomBueng District
15	Female	13-20 years old	Primary School	Ban Talat Khwaaj, ChomBueng District
16	Female	13-20 years old	Secondary School	Ban Talat Khwaaj, ChomBueng District
17	Male	13-20 years old	Secondary School	Suphanburi
18	Male	13-20 years old	Secondary School	Ban Talat Khwaaj, ChomBueng District.
19	Male	41-60 years old	Secondary School	Ban Talat Khwaaj, ChomBueng District.
20	Male	41-60 years old	Secondary School	Ban Kao, ChomBueng District.

According to individual questionnaire, factors of sample group of Thai Soeng Dam people were divided into four factors including sex, age, education, and place of birth. These factors indicated the influence of their actions and interaction with others. Moreover, the factors used for data analysis included two small groups which were male and female. The collected data demonstrated that there were twelve Thai Soeng Dam women and eight Thai Soeng Dam men. Two small groups were divided into younger group and elder group. The younger group aged between 13-20 years old and 21-40 year olds, and elder group aged between 41-60 years olds and more than 61 years old. There were twelve Thai Soeng Dam younger age group and eight Thai Soeng Dam elder age group. It was found that there were three levels of Thai Soeng Dam who had graduated which were Primary School, Secondary School, and Bachelor degree (B.A.). The relationship between age factor and education factor indicated that most elder Thai Soeng Dam studied only at Primary School while the younger Thai Soeng Dam had a chance to study Bachelor degree (B.A.). Lastly, for place of birth, it was found that there were two Thai Soeng Dam who migrated from Suan Phung District and Suphanburi.



RESULTS

Repertoire was a term used in sociolinguistics referred to the range of languages or varieties of languages available for speakers, each of language enabled the speaker to perform a particular social role also known as repertory (Thomas, 2008). Linguistic repertoire of Thai Soeng Dam at Ban Talat Khwaaj represented the competency of a language available spoken by Thai Soeng Dam people.

Table 2: The Number and Percentage Classified by the Competency of Languages Available for Thai Soeng Dam Informants Use

The competency of a Language Available for Thai Soeng Dam Informants Use	Number (n=20)	Percentage
L.1: Central Thai	4	20%
L.1: Thai Soeng Dam L.2: Central Thai	6	30%
L.1: Thai Soeng Dam L.2: Lao	2	10%
L.1: Thai Soeng Dam L.2: Lao L.3: Central Thai	1	5%
L.1: Thai Soeng Dam L.2: Central Thai L.3: Isan	2	10%
L.1: Thai Soeng Dam L.2: Lao L.3: Central Thai L.4: Isan	3	15%
L.1: Thai Soeng Dam L.2: Central Thai L.3: Yuan L.4: Khrang	1	5%
L.1: Thai Soeng Dam L.2: Lao L.3: Central Thai L.4: Isan L.5: Yuan	1	5%

From Table 1 and 2, Thai Soeng Dam women aged 13-20 years old and 21-40 years old spoke only Central Thai. From the interview, it was found that the two women usually spoke Thai when they were in their school and at their home.

Additionally, it was found that there were six people who spoke two languages including L1: Thai Soeng Dam and L2: Central Thai. Accordingly, there were two people with aged more than 61 years old who spoke L1: Thai Soeng Dam and L2: Lao. Only one Thai Soeng Dam spoke three languages including L1: Thai Soeng Dam, L2: Lao, and L3: Central Thai. Moreover, Thai Soeng Dam women who were 13-20 years old could speak four languages including L1: Thai Soeng Dam, L2: Lao, L3: Central Thai, and L4: Isan. While only one Thai Soeng Dam could speak five languages which were L1: Thai Soeng Dam, L2: Lao, L3: Central Thai, L4: Isan, and L5: Yuan since his grandmother is Yuan.

Table 3: The Number and Percentage Classified by the Mother Tongue for Thai Soeng Dam Informants Use

The number classified by mother tongues	The first language or the mother tongue spoken by Thai Soeng Dam			
	Thai Soeng Dam	Lao	Central Thai	Isan
More than 61 years old and 41-60 years old.	14 (70%)	3 (15%)	3 (15%)	-
13-20 years old and 21-40 years old.	5 (25%)	3 (15%)	10 (50%)	2 (10%)

According Table 3, the mother tongue of the elder Thai Soeng Dam who were 41-60 years old and more than 61 years old indicated three language including Thai Soeng Dam, Lao and Central Thai. For the mother tongue of the youngsters from Thai Soeng Dam who were 13-20 years old and 21-40 years old, it



demonstrated four language which were Thai Soeng Dam, Lao, Central Thai and Isan. Focusing on the Thai Soeng Dam Attitudes, it presented a disposition to respond favorably or unfavorably to their own language in the following;

Table 4: General Attitudes towards the Thai Soeng Dam Languages

	The number (n=20)				
	Agree (5)	Neutral (4)	Disagree (3)	NA (2)	No idea (1)
1. I like hearing Thai Soeng Dam	18 (90%)	2 (10%)			
2. Thai Soeng Dam should be taught to all people in this village	17 (85%)	2 (10%)			1 (5%)
3. I like speaking Thai Soeng Dam	16 (80%)	4 (20%)			
4. Thai Soeng Dam is a language worth learning to read and write	17 (85%)	1 (5%)	1 (5%)		1 (5%)
5. Thai Soeng Dam has no place in the modern world		1 (5%)	8 (40%)	10 (50%)	1 (5%)
6. We need to keep speaking Thai Soeng Dam from one generation to next one.	20 (100%)				
7. Parents should not teach their children to speak Thai Soeng Dam			19 (95%)	1 (5%)	
8. You are considered a low class person if you speak Thai Soeng Dam			17 (85%)	2 (10%)	1 (5%)
9. It is difficult to learn Thai Soeng Dam	1 (5%)	2 (10%)	17 (85%)		
10. I am not willing to spend much time learning to read and write Thai Soeng Dam		1 (5%)	19 (95%)		
11. Thai Soeng Dam is a valuable language	20 (100)				

From Table 4, general attitudes towards the Thai Soeng Dam language found mostly agreed.

According to the interview, they were proud to be Thai Soeng Dam and they would like every Thai Soeng Dam to speak Thai Soeng Dam language everywhere and every time. The importance of Thai Soeng Dam language was presented in Table 5.

Table 5: How Important or Unimportant about Thai Soeng Dam Language

The important / The language Value	Important	Neutral	Unimportant	NA	No idea
1. To be accepted in the community	20 (100%)				
2. To live in this village	20 (100%)				
3. To preserve Thai Soeng Dam culture	11 (55%)			9 (45%)	
4. To have more chances to make money	3 (15%)	3 (15%)		14 (70%)	
5. To make more friend or know more people	4 (20%)	1 (5%)	2 (10%)		13 (65%)
6. To study at school	14 (70%)	1 (5%)	3 (15%)	2 (10%)	



7. To communicate with people of the same age	16 (80%)	4 (20%)			
8. Go shopping	15 (75%)	3 (15%)	2 (10%)		
9. To read and write	4 (20%)	1 (5%)		14 (70%)	1 (5%)
10. Bring up children	17 (85%)			2 (10%)	1 (5%)

In conclusion, Thai Soeng Dam language is important in their community especially to be accepted in the community and to live in the village.

DISCUSSION

Some Thai Soeng Dam researches in Thailand explained how Thai Soeng Dam's history was, and some explained Thai Soeng Dam phonology and their culture. For sociolinguistics, Thai Soeng Dam research study of Somsong Burusphat, et al. (2013) was conducted as well. Result of the study of linguistic repertoire and language attitudes of Thai Soeng Dam Ban Talat Khwaaj, ChomBueng District, Ratchaburi Province demonstrated how many languages they could speak in the community as well as how important they viewed Thai Soeng Dam language in their own community. Moreover, language attitudes of Thai Soeng Dam were found that it was one thing that made the Thai Soeng Dam people proud and appreciated the value of their own. The positive language attitude referred to the changeable of conservation that may occurs in the present time.

SUGGESTIONS

1. Further study should investigate and discuss the linguistic repertoire and language attitudes of all ethnic groups in Ratchaburi province.
2. Further study should develop the multi lingual text books from the linguistic repertoire of all ethnic groups in Ratchaburi province.

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A Study of Ability of Critical Thinking on Life and Environment by Using Integrated Learning Method for Grade 9 students

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ABSTRACT

This research aimed to compare the ability of critical thinking of the students who were taught by integrated learning method. Experimental research method was used. Population of this study was 120 students studying science in the first semester of academic year 2017. The sample of this research consisted of 30 students of grade 9 in the 1st semester of 2018 at the Demonstration School of Suan Sunandha Rajabhat University. The sample of this research was used by cluster random sampling. The statistic treatments used were mean, standard deviation, and t-test. The research findings showed that critical thinking of the students taught by integrated learning method between pre-test and posttest scores were statistically different at .05.

Keywords: *Integrated learning method, Critical thinking, Life and environment*

INTRODUCTION

National Education Act (2010) describes approaches to educational management contained in chapter 4, Section 6 which is stipulated that the educational management must be in pursuit of development of a Thai subjects to become a human who possess the highest ability in physical, mind, intelligent, knowledge and virtue aspects and uphold ethnics and is civilized to live and cooperate happily with others. Furthermore, section 23 is stipulated that education management in formal education, non-formal education and informal education must emphasize knowledge, virtue, learning process and integration based on each education level appropriately (Ministry of Education, 2008) in conformity with the Basic Education Curriculum (2008) as it has played an crucial role in a developing learner to become a complete human who upholds morality, possesses intelligence, happiness, understand Thainess, a capability to expand his/her education level and build his/her career by utilizing multiple approaches to learning management and taking their physical development, intelligence, interests and ability into consideration, emphasizing authentic learning, self-learning, collaborative learning, action learning and integrated learning (Ministry of Education, 2008).

Based on a data analysis of learning achievement by grade 9 students in 1st semester, 2018, we found that the students' learning achievement was varied and 30 with sub-par learning achievement was identified. A behavioral observation from the entire classroom while classes or activities being taking place revealed that the students hastily chose their answers carelessly. Thus, no cognitive skill was applied to solve and answer the questions. This demonstrated a lack of cognitive skills especially critical thinking which is essential in learning as it is an important foothold spanning to other cognitive processes and an essential systematic process to be applied for solving many problems encountered in routine life.

Cognitive development has been emphasized by many educators and they perceived that it should be done at the young age as the cognitive abilities would help students to effectively solve problems as said by Prawet



Wasi (2008) “the teaching that improves cognitive ability is the great discovery in 21st century as it is to develop learners to be capable to think, do and solve problems by themselves”. In case of learners possessing a critical thinking skill, they will be a great foundation leading to sustainable learning. Critical thinking is an ability of which the students possess making them capable to think, distinguish, differentiate, and rationalize by applying scientific knowledge in cognitive processes by left cerebral hemisphere. Critical thinking is also a deep and thorough cognitive process from a cause to an outcome (e.g., dictating what to analyze, identifying problems or establishing objectives, assigning texts for categorizing based on the determined subject (Suwit Mulkum, 2012). Integrated learning management is an instructional activities by incorporating learners’ life style, capabilities and interests and allowing learners to participate resulting in action self-learning in every step of integrative activities contained in an entire curriculum, content, several fields of knowledge and sustainable instructional processes between learners themselves (Aorathai Mulkum, 2006). In addition, integrated learning encourages extensive learning activities between a learner and instructor and induces problem-solving skills and capability in learners. Moreover, it helps learners to perceive a relationship between the learning and relevant subject and make them capable to properly apply what they have learned in their routine life (Kanat Thatthong, 2008). Its learning management can relate to real life event. As a result, learners can use the knowledge with its full potential, can transfer and connect knowledge and skills between many subjects, making an application in real life scenario possible (Teerachai, 2009).

Thus, we adopted the integrated instruction in this research in order to develop critical thinking on life and environment with grade 9 students from Demonstration School of Suan Sunandha Rajabhat University. Learning management model utilized the integrated learning which emphasized scientific literacy and had been integrated with several subjects, such as Thai, arts, occupations and technology and foreign language in align with guidelines to a learning reform with learner-centered approaches as per National Education Act (1999) in order to promote critical thinking in students, to allow them to learn and construct knowledge by themselves, to enthusiastically participate in learning activities and to make them capable to apply such knowledge in everyday life.

Objective of the Study

To measure a critical thinking ability of grade 9 students participating in the integrated learning management

HYPOTHESIS

Critical thinking ability of grade 9 students taught by integrated learning was better than before learning.

METHODOLOGIES

Population of the study was 120 students studying science in the first semester of academic year 2017. The sample of this research consisted of 30 students of Grade 9.

DATA COLLECTION AND VALIDATION

1. Data collection

- 1.1 Pre-test: The testing was performed on the sample group to measure an ability level and scores were kept.
- 1.2 Treatment: Integrated learning management on life and environment of grade 9 students was provided to the class.
- 1.3 Post-test: After the integrated instruction, the sample group was tested with post-test questionnaires.



1.4 Data collection: Data from pre-test and post-test from the sample group was collected and analyzed in order to find mean and a target learning achievement value.

DATA ANALYSIS

1. Basic statistics

1.1 Find the mean score (\bar{X}) of the test by using Mean (\bar{X})

1.2 Find variance value by Standard deviation (S.D.).

2. Statistical quality control

2.1 Find validity of contents in a critical thinking tests by applying IOC between the test and behavior.

2.2 Find difficulty (p) and discrimination (r) of the tests by analyzing each question utilizing 27% technique.

2.3 Find reliability by applying KR-20

3. T-test statistical hypothesis was used to compare a variation of \bar{X} before and after learning of a critical thinking ability on life and environment in grade 9.

RESULTS

Table 1: A Comparative Analysis Result Concerning \bar{X} of a Critical Thinking Skill on Life and Environment from Pre-test and Post-test of 30 grade 9 students.

Statistics	Score of critical thinking ability		T-test	P-value
	Pre-test	Post-test		
Lowest	5	12	22.90	0.000*
Highest	13	26		
\bar{X}	8.93	18.97		
S.D.	2.35	3.88		

Remark: *= statistically significant difference at 0.05

A comparison revealed statistically significant differences at 0.05 (P-value<0.05) with lowest score of 5 while 13 was the highest score for pre-learning (\bar{X} = 8.93, S.D. = 2.35). However, as for the post-learning, lowest score was 12 while 26 was the highest score (\bar{X} = 18.97, S.D. = 3.88), signifying that post integrated management on life and environment induced better critical thinking skill of the students than before learning.

Table 2: Development scores (D-scores of the samples)

Statistics	D-scores
Lowest	7
Highest	14
\bar{X}	10.03
S.D.	2.39

According to the D-scores of the samples after participating in integrated learning management on life and environment, every student gained a better score with the lowest of 7 and highest of 14 (\bar{X} = 10.03, S.D. = 2.39) signifying that after participating in integrated learning management on life and environment, the students gained a much higher critical thinking ability prior to integrated learning management.



CONCLUSION AND DISCUSSION

An analysis of students participating in integrated learning management before and after learning found statistically significant difference value at .05 according to the investigation. Several topics were discussed as follows:

The study of ability of critical thinking on life and environment using integrated learning method with grade 9 students before and after learning found statistically different at .05 which depended on the hypothesis. The research findings were as followed:

The integrated learning and integrative activities on life and environment created by instructors satisfied the student’s needs and capabilities and could conform to different archetypes as well as conform to individual aptitudes and abilities. Moreover, with them, learners were able to understand, develop cognitive skill, develop environmental consciousness, gain knowledge leading to creativity spanning to several fields (Ministry of Education, 2011). It could be summarized that a goal of leaning management is to introduce knowledge and encourage understanding of a coexisting relationship system between human and biological, non-biological environment to leaners. In addition, learning integration must be properly utilized with various learning subject groups by taking each educational level into consideration. In other words, learners were aware that there was a relationship between themselves and environment, such as family, community, locality, environment, experience, preservation and rehabilitation, sustainable utilization of natural resources and environment. With combination of contents contained in the learning management plan being attractive and in conformity with the needs of learners, community and locality resulted in ability to perfectly and harmoniously connect knowledge from several subject groups to conformity with learning objectives. Thus, this led to a better critical thinking skill after learners participated in the management in align with a concept by Sukhon Sinthaphanon (2007). The importance of integrated learning management was presented that it introduced learners to learn to how to connect concepts based on several fields to mix and match knowledge and skills to apply in their routine life for their benefits, reduce redundant contents, save time and help learners to possess wide-ranging knowledge, skills, processes or desired characteristics contained in each subject group to be combined. We found that mean score from the critical thinking ability test was 74.20% which met the standard scores of 70%. Mean scores of students who passed the test was 80% which also met the standard scores of 75%. The integrated instruction gained a favorable opinions, that is to say, learners had high satisfaction. Moreover, it increased an attraction rate to the class to high level. An evaluation of outcome showed a good result in align with the outcome of the research performed by Phani Reuangwilai (2010) who investigated an integrated instruction on a science subject and found that the learning management plan on such subject had an higher average efficiency of 80.90/81.17 than the established standard of 80/80 and learning achievement performed by the students was 75.20 that was higher than the standard determined by Ban Tonplong Danmaung School (70%). An attitude towards integrated instruction found positive (96%) in conformity with the study performed by Raliwan Saengmeuangchin (2009) who investigated an adoption of integrated learning management in a science subject group and found that the mean score of basic thinking skill of students in experimental group was 31.92 and S.D. was 7.52 while the students in control group was 23.42 and S.D. was 7.13; t-test was performed on the experimental group and control group and yielded statistically significant difference at 0.05, and the integrated instruction gained a favorable opinion as well. That is to say, the result showed overall high satisfaction in align with a study performed by Likhit Phuangprakhon (2009) who investigated learning achievement on life and environment in problem-solving skill, satisfaction in integrated learning management of grade 3 students, and found that problem-solving skill in grade 3 students was higher after participating in the integrated learning management with statistically significant difference at 0.05.



For this reason, they are good supportive claims demonstrating that critical thinking ability is improved much higher after participating in learning management.

SUGGESTIONS

1. Further study should concern integrated learning management on other science subjects, such as energy, astronomy and space, light and visibility, etc. and a category of content should be investigated to match with instruction emphasizing integrated instructional management
2. An investigation on other variables should be performed, such as problem-solving ability, and creative thinking.

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Exposure to Information and Image of Suan Sunandha Rajabhat University in in Students’ Attitude

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ABSTRACT

The objective of this study is to investigate the media exposure of students to Suan Sunandha Rajabhat University and the correlation between the university image and the media exposure of students to the university. This study was conducted using a quantitative method. The questionnaires were used to collect data from 360 participants. The results showed that the participants were exposed to the media on Suan Sunandha Rajabhat University in the frequent level. The most frequent media that the participants were exposed to were the personal media, website, and the Internet. The details of research results are as follows:

- (1) Students with different genders and faculties were differently exposed to the Suan Sunandha Rajabhat University media at the significance level of 0.05; there is no significant difference in age and college years.
- (2) The media exposure has a positive correlation in the middle level with the Suan Sunandha Rajabhat University image at a statistical significance level of $0.01(r = 0.603; p < 0.01)$

According to the study, there are implications and recommendations as follows: The media exposure on Suan Sunandha Rajabhat University is in the frequent level; therefore, there should be more continuous and regular public relations in various types of media. The interesting media for students are personal media, Website of Suan Sunandha Rajabhat University and the Internet.

Keywords: *Student Attitude, Media Exposure, Image*

INTRODUCTION

Nowadays, many technologies have been developed and increased among the change in the economy and society. We are moving to the age of information that all agencies and organizations must adjust themselves and focus on corporate data management, especially, message sent to receivers who are important to the organization operation. Public relation is a vital tool to communicate between organizations, agencies and message receivers – the target groups – to create outstanding and successful services to the organization.

Suan Sunandha Rajabhat University (SSRU) is a national higher education organization emphasizing on proactive public relations to enhance the good image of the university in order to make people believe in the university’s reputation. SSRU aims to be the ‘Smart Archetype University of the Society’. In 2014, the university has changed its identity and uniqueness as well as the goal to adjust policy to be the first ranking among Rajabhatuniversities, the 15th ranking in nationwide and the 150th in Asia. It aims to build a commonweal among the university employees as well as the outstanding identity reflecting its uniqueness (Suan Sunandha Rajabhat University, 2014). Therefore, to increase the positive awareness, we have continuously planned the PR activities including mass media, broadcasting, radio, television, newspaper and additional media such as vinyl sign, billboard, brochure, leaflet, and websites. As an organization image is very important, PR for positive image will encourage stability and success for the organization.

Students are the key target for university operation; they are the closest beneficiary of the university; therefore, it is necessary to communicate with them as well as to make them trust and build a good relationship



together. Moreover, there should be the right communication channel for the students and it needs to be frequently investigated their media exposure as they are the future graduates that will become the indicator of university achievement.

This study is to examine the media exposure of SSRU students and the correlation between the media exposure of students to the university and university image in their attitude. The findings will be applied to develop, plan, and improve the university operation and media in various forms.

The objectives of the study are:

1. To investigate the media exposure of SSRU students.
2. To investigate the correlation between the university image and the media exposure of students to the university.

LITERATURE REVIEW

This part reviews the literature regarding the concept of media exposure and the concept of image in public relations.

A. The Concept of Media Exposure

In human communication process, there are two components, which are ‘sender and receiver’, that human gets involved. Communication happens when the sender sends message and the receiver exists, so the sender must be always aware of the receiver because the receiver affects the success. The sender has to communicate efficiently to send the message and make it understandable. Moreover, the meaning of the received message must be equivalent to the sent one. It is necessary to analyze who is the receiver – the target –, what is the sender’s intention, or whether there is the satisfaction of media exposure to accomplish the communication objective (Virojsrisakul, 2003).

According to Merill and Lowenstein (1971), each receiver has different behavior of media and information exposure. There are a variety of driven factors including loneliness, curiosity, and the need of seeking information that is advantageous to oneself as well as the receiver’s individual characters such as age, gender, education, economic and social status and the unclear components such as attitude, hope and fear. These factors have an influence on the choice of media usage and each media has a unique characteristic that can reach, respond, or satisfy individual.

The receiver will have different behavior to choose or be exposed to media depending on a variety of the factors including individual’s requirement, environment, reason and the necessity of media exposure. People always opt for media exposure with the least effort but the highest return. Additionally, Schram (1973) states that the components of the receiver’s media exposure include their experience, media seeking, media evaluation, their education background, environment, message receiving ability, personality, emotion, and attitude.

B. The Concept of Image in Public Relations

Under the circumstance that is changing at all time, the organizations need to adapt themselves for survival and be more competitive with other organizations. PR is the important communication tool to build good image for the organization. Cutlip, Center, and Broom (2006) explain that public relations is the task of administration management to build and maintain the relationship and common interest between an organization and other organization or a person related to the success or failure of organization operation. Kotler (2000) mentions that image is the whole component of belief, thought and impression that individual feels to something and their attitude and action to that thing are highly related to its image. Additionally, the image does not only compose of facts, but also relates to the perception from personal judgment that also includes bias (Wongmonta, 1999). More explanation is as shown in the Figure1.

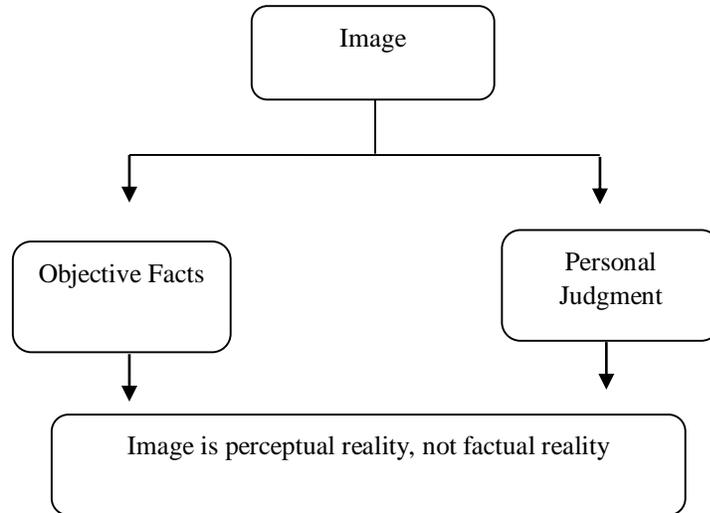


Figure 1: How to perceive the image

Lapirattanakul (2010) explains that to build the good image for the organization, the PR officer has to identify strength and weakness of organization, plan and use the content, information, tool and media to convey the message to the target receiver. Therefore, the image is the important thing that many organizations must turn attention to. Although, SSRU is the non-profit organization providing education service, it also needs to focus on PR and building a good and outstanding image to the organization. According to the study of Kornkanok Virojsrisakul (2003) about the image of Chulalongkorn University in the perception of people in Bangkok, it shows that the image of Chulalongkorn University is outstanding on the point of being a famous education institute with smart students and being ready to provide education service as it is the first university in Thailand and is acknowledged as the education leader.

METHODS

This research was a quantitative survey research using a questionnaire to collect data. Populations for this study were SSRU students. The author used G*Power Software to calculate the minimum sample size needed for this study (Faul, Erdfelder, Buchner, & Lang, 2009). With the multi-stage sampling method, the sample contained 360 students from four faculties, which are the Faculty of Management Science, the Faculty of Education, the Faculty of Science and Technology, and the Faculty of Industrial Technology. This study used t-test, analysis of variance (ANOVA) and Pearson’s Product Moment Correlation Coefficient for testing the hypothesis. It is tested at the 0.05 level of significant.

The hypotheses of this study are as follows:

Hypothesis 1: The students with different demography are differently exposed to SSRU information.

- 1.1 The students with different genders are differently exposed to SSRU information
- 1.2 The students from different faculties are differently exposed to SSRU information
- 1.3 The students inform different years are differently exposed to SSRU information

Hypothesis 2: Media exposure has correlation with the image of SSRU.



RESULTS

The total samples for this study were 360 students, with more female (55.6%) than male (44.4%). Most of them (33.3%) were sophomores equally selected from 4 faculties, the Faculty of Management Science, the Faculty of Education, the Faculty of Science and Technology, and the Faculty of Industrial Technology, which was 25% in each faculty. The levels of media exposure were ranked from most frequent, frequent, and average. Most of them were exposed to personal media from classmates ($\bar{x} = 4.75$), other media from the university website ($\bar{x} = 3.61$) and internet media ($\bar{x} = 3.53$) respectively.

Table 1: Media Exposure of Sample

Media Exposure	Mean	S.D.	Meaning
Personal media			
1. Classmates at SSRU	.85	4.75	Most frequent
2. Lecturer at SSRU	.83	3.52	Frequent
Other media			
1. SSRU website	.88	3.61	Frequent
2. Internet media	.95	3.53	Frequent
Mass media			
1. Television	.90	3.36	Average
2. Radio	.92	3.23	Average

According to the hypotheses, it is found that (1) the students with different genders and from different faculties were differently exposed to SSRU media at 0.05 level of significance, Gender $t_{(358)} = 2.755$; $p < .05$) and Faculty $F_{(3,356)} = 4.290$; $p < .05$)

However, there was no significant differences in the samples with different age ($F_{(2,357)} = 0.216$; $p > .05$) nor different year ($F_{(3,356)} = 0.735$; $p > .05$); therefore, the hypothesis 1 is partly accepted. Additionally, it is found that media exposure has correlation with image at the significance level of 0.01 ($r = 0.603$; $p < 0.01$) as in the hypothesis 2.

CONCLUSION AND FUTURE WORK

According to the research results, it can be concluded that hypothesis 1 is partly accepted that the students with different genders and from different faculties were differently exposed to SSRU media at the significance level of 0.05, whereas there was no significant differences in the samples with neither different age nor different year. It is in accordance with Jirasophon (1995) explaining that a person differently chooses and searches for information depending their different requirement and expectation. Hence, analyzing the receiver with demographic information shows that the receiver with similar demography has similar psychological characteristic. On the other hand, a person with different demography has different psychological characteristic. According to Sae-Chin (2017) study about Online Media (Internet) Exposure Behavior of People in Bangkok, it finds that demographic information of age, education, and income has correlation with the frequency of online media exposure. Moreover, Dejatiwongsa Na Audhya (2015) studying about behavior of media exposure and image perception finds that the students with different gender and grade point average (GPA) have significantly different media exposure to Faculty of Industrial Education



and Technology at Rajamangala University of Technology Srivijaya (RMUTSV) as well as their media has positive correlation with the image perception of RMUTSV. It is consistent with Hypotheses 2 of this study – media exposure has correlation with image. Additionally, Phrutthipongsit (2001) found that the research result was in accordance with that media exposure has positive correlation with image and satisfaction of communication and service of Bangkok Metropolitan District Office.

Public relations is an important tool driving the target to be exposed to media and enhance positive image to the organization. Understanding the target and able to use appropriate media is essential. Students, the receivers, are people in generation Z who have been raised being familiar with technology. Media reaching this target is personal media such as friends and classmates as they are from the same group with common interest; therefore, new media, internet and website are suitable to this target. In addition, this study found that the samples were exposed to information about SSRU in level of frequent to average; there should be continuously and frequently more PR in these media.

The recommendation for future study is that there should be other research methodologies such as focus group discussion or in-depth interview to expand the research findings for in-depth discussion. The sample group of this study is only SSRU students. To obtain more insights about media exposure and university image, the future study should collect data from other targets such as university staff, nearby community and other parties related to the university operation.

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The Persistence and Public Relations Approach for Students of College of Innovation and Management Suan Sunandha Rajabhat University

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ABSTRACT

This research study aimed to 1) investigate motivation of students choosing to study in the College of Innovation and Management Suan Sunandha Rajabhat University 2) explore the attitude of students toward teaching and learning in the College of Innovation and Management. 3) find out the ways to get students to choose to attend the college. The study uses sample interviews from the students of the College of Innovation and Management at Suan Sunandha Rajabhat University. The data reaches the saturation point and is consistent after the interview of 20 students.

The research found that in terms of motivation, the students had a consistent opinion on the shorter duration of study than the other faculties. The students revealed that they want to work as soon as possible. Some students explained more about family status as the driving force to rush them to finish the study and earn money as fast as possible. In terms of attitudes towards the College of Innovation and Management, it was found that students had consistent consensus on college faculty, student access, and student-teacher relationships. There is a consistent consensus on the shorter duration of the curriculum than other faculties; it caused students to continue to finish their studies, as well as their motivation. In terms of campaigning and public relations to gain entry into the college, students agreed on how to use social media more effectively. High school students should be able to access information in their choice of higher education for further study.

Keywords: *Attitude, Motivation, Intention, Student.*

INTRODUCTION

The decreasing of population birth rate affects the decrease of student enrollment. There is a high degree of competition for undergraduate students. Each institution has to accelerate its own strategy for increasing the number of students.

The College of Innovation is managed by the University, which requires management to rely on student revenues for teaching and learning. For the above reason, the College of Innovation is aware of this and needs to get higher rate of students to continue. It needs to find motivation of students in choosing to attend, and attitudes towards teaching and retention in schools. In addition, public relations approaches will draw the attention of high school students to plan and make projects that meet the needs of students who want to learn including effective public relations so that students choose to study at the College of Innovation and to confirm the information is quite clear. Therefore, it should inquire the students who study with the College of Innovation. This information will greatly benefit the College of Innovation.

The researcher was interested in studying attendance, persistence, and public relations approach for students of innovative students.



LITERATURE AND THEORY

Theory of Motivation

There are six motivational theories.

1. The theory of the relationship between propulsion and lure needs is based on the principle that an individual's demand is the driving force for the individual. Acting behavior to achieve goals is in a lure machine, such as when a person needs food to be hungry; the body is struggling to get food for the needs of the person. When the person is satisfied, the demand is gone because the body is restored to a balanced state.

2. Motivational provocation theory is a stimulus for individuals to express behaviors.

Degree is a stimulus for high school graduates struggling to get a degree.

3. Individual Erotic Theory Demonstrates Demand Behavior

If an erotic occurs, young men can be erotic by watching a woman's smile. For instance, "Today's dress is good" or "this dress is very special".

4. Theories of person learning to show behavior if desired. For instance, "what would you like to know?" or "by anticipating events in advance".

5. The theory of psychoanalysis is what the behavior of a person is.

Behavior of individuals in response to the need to keep in mind as the younger brother pretended to be angry at the mother in the previous times.

6. Instinctory theory is the belief that instinct is the motive force for human action.

Instinctive instinct is an example of behavior that is not derived from learning.

7. Propulsion theory places emphasis on biological propulsion, such as hunger, thirst, sexual desire which cause stress

8. Maslow's Abraham Maslow's demand theory.

Theory of Using Media for Benefit and Satisfaction

Key concepts in using media for the benefit and satisfaction of the recipient focus on the importance of the recipient as the main factor in deciding which type of media to use and the content of substances that meet the needs of people to bring satisfaction to the recipient. The use of media and exposure to such substances may become a major motivator in the next generation of behavioral exposure to the same type of exposure.

The use of media to satisfy the recipient is a change of orientation that focuses on the role of the messenger and analysis of the needs of media users. The factors involved in the social and psychological process of the user explain the behavior of the media consumption as well as the five basic human needs.

Humans also want to learn to seek the rules and understand the surrounding environment. They need to know this since it is the driving force of humanity derived from social coexistence that equates to accept that. We intend to seek news from the media not only because of the one sided influence of the media as previously thought. Another important aspect in this theory is the fifth study of the importance of role and person. In which to choose exposure, the pattern of exposure behavior is to be considered before continuing to see the effects of exposure to these substances.



METHODS

Participants in this study is the first year of the College of Innovation and management students that were randomized by the number of respondents and the data had been collected until the data became saturated. Instrument used in the research was a questionnaire that was made as guideline questions while interviewing participants.

Interview

1. Study and create an open - ended interview for research purposes.
2. Take the interview form to the experts to assess the relevance of the research objectives.
3. Adjust the interview form based on evaluation results and expert advice.
4. Use the interview form to interview students in the motivation to choose to study in the College of Innovation by recording the information obtained from interviews and voice interviews.
5. The results of the interviews were analyzed by using the table of contents analysis.

Table 1
Table of Content Analysis

Participant	Data				
	Issue A	Issue B	Issue C	Issue D	Issue E

6. After three weeks, an interview on attitudes when attending the College of Innovation was conducted by taking notes and recording from the interviewees.
7. Apply the interview results of students to analyze each issue using the analysis table.
8. After four weeks, the researcher conducted an interview about the persistence of students in the College of Innovation by recording from the interviewees
9. Apply the interview results of students to analyze each issue using the analysis table.
10. After four weeks, the researcher conducted an interview about finding a way to engage students in an innovative college by recording from the interview.
11. Apply the interview results of students to analyze each issue using the analysis table.
12. Present the results by writing a sequence of individual objectives.

Analysis

The recording of the interview was used to find out the correlations of the informants as well as to analyze the causes and ideas of the college students.



RESULTS

In the motivations of interviewing student representatives, researchers can analyze concepts or approaches. The student's consistent opinions and motivations were generated from the interview. There are nine issues in the topic “Graduation and work in diversity”. The issue is “a new and interesting group”. The issue of “seniority or acquaintance recommends to study”. Other “open” issues are required by the organization when the study ends. The other issue was “pleasant atmosphere” issues. Teachers and advisers have easy access “issues” institutional credits. The issue of “expenditures on education are appropriate”, which displays the results of students’ interviews to address issues. The motivation for choosing to study in the College of Innovation and Management will find the issue “the duration for completion is shorter than in other faculties,” commented the most consistent interviewer. According to the information provided by twenty students of the College of Innovation and Management, sixteen respondents provided consistent feedback.

The attitude of students in attending College of Innovation and Management from the interview to student representative, the researcher can analyze concepts or approaches. The student's consistent opinions and motivations are generated from the interview. There are seven issues in the topic: “like the brotherhood”. The “issues” like to update the teaching materials are regularly updated in the college. The “issues” like the environment of the place used in teaching and the atmosphere. The “issues” like the activity together. The teaching of the teacher is easy to understand, practical and close consultation “issues” like society and friends. Good in the college, which shows the results of the interview to determine student issues. It is the attitude of the students who attend the College of Innovation and Management. They will find the issue like college professors who have easy access. Being careful is the opinion of the interviewer, the most consistent one with the corresponding information twenty people.

The persistence of students entering the College of Innovation and Management from the interview to student representative, the researcher can analyze concepts or approaches. The student's consistent opinions and motivations are generated from the interview. There were 8 issues, namely, “getting to know the brotherhood”, “getting to know the teacher's friendliness”, “getting help from the teacher”. As a family, issues are recognized as “college” issues by students of the college. The student’s opinion displays the results of student interviews to determine the issues. This is the reason for the persistence of students entering the College of Innovation and Management. Will find the issue “teacher's friendliness” was the most consistent opinion of the interviewers, with nineteen cohorts.

The campaign and public relations to gain entry into the College of Innovation and Management from the interview of the students, the researcher can analyze concepts or approaches. A consistent opinion of students and create a public relations concept. The issue should “highlight” the topic of the work or line of work appropriately in accordance with the curriculum. The issue should show or convey to high school students the familiar atmosphere of college seniority. Receiving help from the teacher “issues” getting a sense of belonging to the family, “issues” should be displayed or conveyed to. A high school teacher in recognition of the caring atmosphere colleges “issue” was featured on the course of 3 years of college and high school students to careers “issues” colleges should provide more access to social media as well as establish a network with the site administrator or more electronic media, which displays the results of student interviews to determine the issues. Guidelines for public relations and campaigning to gain entry into the College of Innovation and Management will find the issue “colleges should reach more social media and establish a network with the site administrator. The idea is that the most consistent commentators are fourteen people.



DISCUSSION

Motivation from the results of the analysis and transcript of the motivation for students to choose to attend the College of Innovation and Management found that students had consistent consensus on shorter study periods than other faculties. More interviews with students. Students revealed that they want to work as soon as possible. Moreover, having a bachelor's degree is only the way to get a work permit. Some students explain more about family status as the driving force to rush them to finish the study to earn money as fast as possible. Some commentators have provided additional researcher comments to support motivation; "there is a shorter education period than other faculties", i.e. They think of the way to a career. I want to graduate early to start a career as soon as possible. Need to hurry to finish work to help my family earn money and if you can finish it before your friends. The same model studied by other faculties.

Attitude toward the effects of analysis and paraphrasing on student attitudes toward college innovation and management was found that the students had a consistent attitude towards college professors “like college professors who have easy access”. It may be because every faculty member has access to students and relationships between faculty and students, rather than other faculties. The attention and guidance of the faculty members is more than the faculty. The students were given the opportunity to comment, such as teacher friendly. Every caregiver cares for advice. In the life of a student like a high school teacher. Close to the students and teachers can talk and to meet at any time.

Persistence Based on the results of an analysis and transcript about the persistence of college students, innovation and management. The student has a concept. The "teacher-teacher-friendly" approach is consistent with the attitudes toward college, innovation and management.

Campaign and Public Relations Based on the analysis and interpretation of the public relations concepts of college students, innovation and management in campaigning and public relations to gain entry into the College of Innovation and Management. The student has a concept of “colleges should reach more social media as well as establish a network with the site administrator”. The concept is consistent with the social media usage patterns of high school and college students, and the frequency with which they search for information. This type of media is high. The informant is an undergraduate student involved and daily living habits are related to the use of online media on a daily basis. In addition, the informants also revealed that during high school. Most of the information that is provided by most social media institutions is online. The student provided additional comments that could be interpreted by the researcher. For example, before achieving a bachelor's degree, you will find information about the institution you are studying in. Before the examination, you will search for information about the atmosphere. What to learn Content from different universities. From the Internet It can be researched through a smartphone.

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A Study of Senior Tourist Behavior in Nakhon Pathom Province

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ABSTRACT

The research investigates travel motivation of Thai elder tourists in Nakhon Pathom Province. The results of the study from the analysis revealed that there were personal and external factors which need to be considered before travelling. Factors in this research were chosen from other relevant studies in travel motivation and there were 400 respondents participated in the study: tourists in Nakhon Pathom. Significant variables are a variety of tourism destination and recreation, cleanness of city, toilet, and available tourism media. The great majority of them attend cultural sites and visit relatives.

Keywords: *Travel Motivation, Elder Tourists in Nakhon Pathom*

INTRODUCTION

According to the statistics of World Trade Organization (WTO), the number of elderly tourists or grey hair travelers will be growing rapidly until 2020. The immense socio-graphic change has drawn out the transformation of tourism industry and its service quality. The impact spreads throughout the world destination and encounters new parameter of service quality and destination management to satisfy this type of tourist. While the demand and number of senior tourist is increasing, the infrastructure in tourism industry is still limited. The potential to improve destination capacity is needed to be studied and fostered for higher competitiveness. The research area in this study is Nakhon Pathom Province while the research survey focuses on seniors Thai who spend their journey at various tourist destinations in Nakhon Pathom Province during December 2017-February 2018.

LITERATURE & THEORY

The research covers three principles related to the study of senior tourist behavior: tourist motivation from both intrinsic and extrinsic aspect, common senior tourist behavior, and tourism in Nakhon Pathom. This chapter illustrates the general concept about tourism industry in Nakhon Pathom and tourist motivation. Tourist destinations in Nakhon Pathom are research area to gather data from respondents.

Tourist Motivation

Motivation is defined as the final result of human need. Tourist motivation is therefore generated and delivered from psychological reason which tourist takes into his or her account for decision making to travel (Kotler et al., 2005). The researches in tourist motivation have been conducted by scholars from different time with different academic background such as anthropology, sociology, economics, and psychology (Dann, 1977; Crompton, 1979; Gnoth, 1997). Destination including its attractiveness is the principle thing in tourism industry. Kozak (2002) mentions that final conclusion of tourist motivation leaves the shortcut to success in tourism industry for related tourism stakeholders. Then, the understanding of tourist motivation can identify tourist perception toward



destination and helps match tourist with favorite destination. The development in destination has driven the research in tourist motivation. Additionally, Crompton (1979) suggests that it is easy to do the study by asking the question on who, what, when, and where to the visitors. However it is more interesting to ask “why”. “*Why question*” can determine the value, motivation, and perspective of tourist toward a destination.

Dating back to half a century, Plog drew out the tourist motivation figure in 1967. This study dealt with the allocentric-psychocentric aspect. Allocentric traveller is the one who is non-adventurous and remains conservative. They are very less curious to experience a new place. On the contrary, the psychocentric tourist is an experience seeker and world explorer. They are ready to learn new cultures and take a risky circumstance. Moreover, Plog illustrated tourist whose character is in the middle between allocentric and psychocentric, *the mid centric tourists*. To conclude, the theory of tourist motivation presented by Plog can draw out the understanding of one’s personal background and perception towards travelling that covers some example of preferable destination. Pearce et al. (1983) link the theory of tourist motivation to Maslow’s hierarchy. This ladder presents the level human needs divided from basic to the highest level. At the bottom, Maslow illustrates the basic human need or physiological need: food, water, air, clothes, and medicines. Safety is the second factor to survive as human prefers to stay in stable and trustable situation. Then, relationship and interaction with society stands for the third factor to live. Lastly, the most important factor in Maslow’s hierarchy influences role in the tourist motivation is the top two highest of the summit: self – esteem and self – actualization. These aspects are varied and lead to the argument and study in socio – psychological reason in tourist motivation (Dann, 1977).

Socio – psychological reason can be called as push and pull factors which influence people to go on travelling (Dann, 1977). Push factor is intrinsic motivation and pull factor is extrinsic motivation. Two of these factors have impact on tourist whether decide to travel (Uysal & Hagan, 1993). It is important to consider these motivations; push and pull factors determined in this study how elderly tourist engages with tourism in Nakhon Pathom. Push factor refers to mental influence that tourist takes into account for decision making to take a trip. Some people want to escape from daily routine. Iso-Ahola (1982) callsthis type of tourist as “escape-seeker”. They wish to regress to the state of childhood when travelling or even to calm their mind. Family can share a time together to build strong relationship. The mutual cultural exchange can be one of factors that motivate people to travel. Alegre and Pou (2007) arguethat push and pull factors are related to the length of stay, type of activity, and purpose of visit. However, Baloglu and Uysal (1996) describethat pull factors are emerged in the outcome of destination attractiveness perceived by tourist. In other word, pull factor stands for a wide range of attractiveness, culture and heritage, fine weather, safety, destination’s political situation, and travel cost. Moutinho (1987) adds that tourist affected by pull factors will learn the way to spend money and travel, especially the way to make a travel decision. Their personality might change after previous trip. The research tickles the study in tourist future behavior because one of push and pull factors that motivate elderly Thai people to travel in Nakhon Pathom and the way to fulfill their expectation and satisfactory. In addition, Ryan & Deci (2000) discover that tourist motivation can be divided into the level of motivation; how much push and pull factor weights on tourist’s decision making and what kind of push and pull factors that tourist take into their account before travelling. Ryan (2002) states that the mutual relationship between push and pull factors. Neulinger (1974) and Csikszentmihalyi (1975) headed to the large extent of the difference between intrinsic and extrinsic motivation. This study is detailed in two types of tourist motivation including its sub concept to find out how it works on tourist’s perception. The effect is derived from both intrinsic and extrinsic motivation.

Intrinsic Travel Motivation

This motivation is derived from one’s mind to fulfil expectation and satisfactory. This pleasure is an immediate satisfaction derived from activity in tourism. Csikszentmihalyi (1975) portrays intrinsic motivation as a sense of flow. Life is guided and motivated by two awards: psychic entropy and flow. Psychic entropy refers to



mental disorder that people try an effort to overwhelm such uncomfortable feeling and to relax. In term of tourism, elderly Thai tourist might love to stay in a peaceful atmosphere or far away from home. To conclude, intrinsic motivation stands for the collection of gender, generation, nationality, academic background, religion, and marital status (Olson & Peter, 1996). Their domination affects directly elderly Thai tourist’s free time and income. These mentioned factors which is generally called demographic characteristics, have a great impact on tourist behavior and how they manage their stay (UNWTO, n.d.).

Perceptions and Needs

Term and scope of perceptions toward travelling are defined and argued by scholars. Tourist perception is figured out by tourist satisfaction (Ryan, 1997). For the need in travelling, the study emphasizes personal people’s need. Iso – Ahola (1980) explains that people develop themselves and fulfil their desire by travelling. He remarks that travel strengthens the level of self – determination: principle element in intrinsic motivation. He finds that people who seek to fulfil their personal need always spend holiday to maintain this feeling. The hierarchy of Maslow is also adapted to tourist perceptions and needs. Beard and Ragheb (1983) declare four elements of tourist perception based on the hierarchy of Maslow. These four aspects tickle instinct, personal needs and goals.

The Intellectual Component

Tourist discovers himself/herself and his/her preference while learning new things outside his home.

The Mastery Component

Tourist wants to achieve dream, self-challenge, self-master, and compete with others. In general, people set different goal in travel, this aspect, therefore, is varied.

The Social Component

Tourist regards journey as the way to build relationship with friends and to get intra–personal linkage. Travel also builds the esteem from friends, family, and peer.

The Stimulus – Avoidance Component

Tourist escapes from stressful situation derived from society and daily routine. Peaceful moment and calmness are the point of this component.

Extrinsic Travel Motivation

Other impact on people’s decision to take a trip is a pleasure. Ryan and Deci (2000) arguethat extrinsic motivation stands for external factor. Extrinsic motivation, the secondary aspect, influences intrinsic motivation or the primary factor too. Both of motivation has a mutual relationship and enriches each other (Calder & Staw, 1975). The extrinsic motivation can be divided into three aspects: economic, supply, and society.

Economic Aspect

The economic situation plays major role to people on making decision to take a trip. People, in general, prefer spending money on travelling during leisure time (Ryan, 2005). Economic factor has immense influence on the way tourist consumes and manages the length of stay.

Supply Aspect

Another important role in extrinsic motivation is supply side in tourist industry. As tourists seek for the quality that is worth for their budget, continuous development in tourism supply side is challenging for stakeholders. Supply side covers the offered products in tourism area. Tourist products refer to all things consumed tourist’s stay. Specifically, tourist destinations are related with activities tourist participates in including various type of accommodation. Tourist product can be both tangible and intangible: bundle of activity, service, and benefit and satisfaction for final visitors’ experience (Medlik & Middleton, 1973). Tourist products are categorized into five components: tourist attractions, facility, accessibility, tourist image, and price. Additionally, Pine and Gilmore



(2002) focused on the experience derived from further tourist product: entertainment, education, aesthetic value, and escapism. Hjalager (2002) proposed that the process to keep experience up should be steadily and frequently updated due to the shift in tourism trend.

Social Aspect

Aristotle stated that human is social animal, therefore the main influence that people take into consideration for making decision to travel is family, peer, social class, and culture. Social role in tourism is like the two sides of coin. Many travelers let social role influence their decision making while some other rely on their own reason (Kotler, et al., 2005).

Gnoth (1997) proposed three elements as basic concept for tourist motivation which includes motivation, expectation, and then attitude. The relation between these terms and attempt is that travel motivation plays role in attitude toward a visit. Then, tourist’s expectation of visiting can affect their perception toward visiting also. To conclude, travel motivation generates and empowers the relationship between expectation and attitude.

Elder Tourist Behavior

WTO declares that the number of elderly tourist will be increasing rapidly until 2020. This demographic change widely raises complex demand, different holiday purpose, and also traditional holiday. The lower birth rate echoes the trend in aging tourism.

Many scholars left the concept of being senior, but the definition of aging tourist is blurred. García and Martorell (2007) define two characteristics of being senior: age and retirement. Generally, people become retiree at the age of 60-65. They turn into tourist with physical sufficiency, more free time, and more financial resource. Fleischer & Pisam displayed the motivation of senior tourists that they travel for relaxing, socializing, seeing new destination, and seeking for experience.

Common characteristic of senior tourist and the way they consume during the trip is figured out as following. They have a broad range of accommodation choice and prefer travel with family as a life companion. The stay of aging tourist lasts longer than another trip of various life cycles: 1-3 nights, 4-5 nights or up to 9 nights (VVAA, 2009). Their chosen mean of transport is always a private car following by plane and train (Prideaux et al., 2001). They somehow choose a destination from word of mouth and tour package stands for the best choice for senior tourist (Ryan, 1995). Elderly tourist is always appealed by destination that is “accessible” because they consider this context as a symbol of “high quality of destination and service” (Franco, 1999).

Success in senior-oriented tourism requires the creation of decisive tourist product that synergizes the need of elderly people from different background: rich and poor, firm and disabled, educated and uneducated, for example. Potential development covers the accessibility of destination, marketing and branding of tourism supply side.

Relevant Studies and Discussion

There are Thai scholars conducting the research on elder tourism or grey tourism issue as follows:

Sangsakorn, K. et al. (2011) found that tourism elements for senior tourist such as accessibilities, amenities, value and facilities still need more development to welcome that group of tourist whereas the information is not accessible and relevant groups of interest do not consider elder tourists as target.

Sibi.P.S (2017) perceived grey tourism as an opportunity to create new market chain. Even though grey tourism may refer to “place specific” with high demand in quality and comfort.

Alen, Dominguez and Losada (2012) found that. People with saving money, high salary, full of travelling experience, and being healthy, are always not in seasonal travel.

All of findings and arguments in these studies are the guideline to conduct this research



METHODS

The study was conducted under a quantitative method whereas number of the samples was 400 elder tourists in Nakhon Pathom during December 2017 - February 2018. The research question was formulated based on concept of elder tourist behavior and travel motivation as following:

-Questionnaire for Senior Tourist Motivation Research-

The objective of this research is to find out the motivation of Thai senior tourist in decision making to travel to Nakhon Pathom.

On behalf of Suan Sunandha Rajabhat University, your response will be kept privately and only aggregated information will be published in research only. Thank you for your support!

Part 1: General Information

1.1 Gender: Male Female **1.2 Age:**years old

1.3 Average Income/month

- Less than 5,000 THB 5,001-10,000 THB
- 10,001-15,000 THB Higher than 15,001 THB

Part 2: Travel Motivation

2.1 Purpose of Travel to Nakhon Pathom

- To relax To visit relative
- To learn history and culture To practice religious activity
- Other, please specify

QUESTION	Strongly Disagree	Disagree	Neither agree Nor disagree	Agree	Strongly Agree
	1	2	3	4	5
1. Nakhon Pathom is great place for senior tourist					
2. Variety of tourist					



destination	
3. Satisfied service from staff	
4. Enough parking lot	
5. Reasonable price	
6. Cleanness of destination and toilets	
7. Safety and security in destination	
8. Convenient mean of transport	
9. Available tourist information from Nakhon Pathom tourism authorities and private sectors	
10. Attractive tourism promotion and special offers from Nakhon Pathom tourism authorities and private sectors	
11. Free and available media for Nakhon Pathom tourism promotion (brochure, guidebook, etc.)	
12. Attractive and suitable activities for senior tourist	
13. Friendliness of local	
14. Clear traffic signal	
15. Nakhom Pathom tourism helps conserve culture and tradition	
16. Word of mouth influences your travel decision	



17. Social conflict affects your travel decision

RESULTS

There were 400 senior tourists in this research, divided into 186 male and 214 female with the average age of 63. Their average income per month was between 10,001-15,000 THB. The great majority of elder tourist visit Nakhon Pathom for religious reason ($\bar{x}=4.07$, $SD=.990$). Then, the most attractive travel product of Nakhon Pathom was the variety of tourist destination ($\bar{x}=4.07$, $SD=.776$). The table 1 describes the detail of each travel motivation variable.

Motivation	Mean	Std. Deviation	Std. Error Mean
<i>Purpose of Travel to Nakhon Pathom</i>			
1. To relax	3.58	.960	.059
2. To visit relative	4.05	.600	.051
3. To learn history and culture	3.67	.863	.053
4. To practice religious activity	4.07	.990	.085
<i>Travel Product</i>			
1. Nakhon Pathom is great place for senior tourist	3.41	1.246	.077
2. Variety of tourist destination	4.07	.776	.067
3. Satisfied service from staff	3.57	.895	.055
4. Enough parking lot	3.54	.973	.083
5. Reasonable price	3.72	.758	.047
6. Cleanness of destination and toilets	3.76	.945	.081
7. Safety and security in destination	3.17	1.292	.080
8. Convenient mean of transport	3.07	1.410	.121
9. Available tourist information from Nakhon Pathom tourism authorities and private sectors	3.68	.933	.080
10. Attractive tourism promotion and special offers from Nakhon Pathom tourism authorities and private sectors	3.31	1.007	.062
11. Free and available media for Nakhon Pathom tourism promotion (brochure, guidebook, etc.)	3.76	.762	.065
12. Attractive and suitable activities for senior tourist	3.42	1.058	.065
13. Friendliness of local	3.10	1.088	.093
14. Clear traffic signal	3.18	.816	.050



15. Nakhon Pathom tourism helps conserve culture and tradition	3.21	.802	.069
16. Word of mouth influences your travel decision	3.17	.878	.054
17. Social conflict affects your travel decision	3.45	.796	.068
11. Free and available media for Nakhon Pathom tourism promotion (brochure, guidebook, etc.)	3.48	.923	.057
12. Attractive and suitable activities for senior tourist	3.38	.844	.072
13. Friendliness of local	2.92	.761	.047
14. Clear traffic signal	3.49	.989	.085
15. Nakhon Pathom tourism helps conserve culture and tradition	3.29	1.007	.062

TABLE 1

CONCLUSION AND FUTURE WORK

This chapter gives the conclusion of finding in research questions, conclusion of relevance, and limitation of the finding. There were 400 senior tourists in this research, divided into 186 male and 214 female with the average age of 63. Their average income per month was between 10,001-15,000 THB. A great majority of elder tourist visit Nakhon Pathom for religious reason. Then, the most attractive travel product of Nakhon Pathom was the variety of tourist destination.

For future researchers, they are recommended to conduct research related to community and tourists. As the result shows that there is less contact among tourist and local, it is interesting to conduct a research that can strengthen the hands-on tourism and experience exchange. The practical recommendations are given for related stakeholders in NakhonPathom tourism such as government, tourist planners, and private sectors. The finding in this research is useful for them to increase quantitative and qualitative development. They can figure out the strangeness and weakness of NakhonPathomtourism from this dissertation and formulate the promotion strategy to attract new travellers as well as bring the previous travellers back to visit Thailand again. Regarding the research outcomes, relevant stakeholders in leisure and tourism can build up some tourism campaigns or festival to strengthen relation or interaction among tourist and community.

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Emo Myth: 10-Year Follow-Up Stereotype Test of Emo Teens in 2000s

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ABSTRACT

Emo subculture has been considered as a folk devil which caused moral panic regarding self-mutilation and suicide tendency. After the suicide cases in 2007, media began to construct the stereotype for emo children and people outside this subculture has together created a spiral of silent. The current study primarily aimed to understand this stereotype whether it really exists. Content analysis was used to determine the data which is available on Facebook profile of emo kids who joined online emo community during 2008. The finding revealed that most emo children from that day are currently working in professional careers and do not have a depression symptom. The result disproves the stereotype given by the media and outsiders. This study suggests that myth in media and stereotype do not only misguide others, but it might also hurt people who are stereotyped. Fortunately, emo children could find the way to walk through the myth and meet a positive light in their life.

Keywords: *Emo, Myth, Stereotype, Subculture*

INTRODUCTION

Stereotype is what people use to classify others, generally based on visual appearance and social position (Fiske, Cuddy, Glick, & Xu, 2018). People often misuse the stereotype, such as to discriminate others by focusing in their unchangeable identities (Block, Cruz, Bairley, Harel-Marian, & Roberson, 2018). These identities could be gender, social, and racial one. Although some stereotype suggests us to positively view some group of people, it still blinds us to see the reality and prevent us to judge people as individuals - not as group-. People in emo subculture, generally called, “emo kids”, had been widely stereotyped by the outsiders, especially in the age of emo boom, 2006-2008. This stereotype of emo kids was mostly negative, since it is related to self-harm, suicide tendency, and other mental problems. The current study tested if the stereotype of emo kids given by the outsiders really caused negative subsequences in their life. This also helps point out that this stereotype was the fact or it is just only a myth.

1. Music Fan Identities

Although fan identity is a choosing-change identity, it still requires a large amount of time to consider being a fan of someone; and to consider dislike someone that one had liked before. To discriminate others by focusing in their fan identity might not be something rightful to do. This part of the present study provided an overview regarding music fan identity.

Because choosing-change identity can be changed according to an individual’s decision, one would look for reasons to support their decision of being fans of someone, for inatnce, heavy metal fans discussed in a focus group session that they had been heavy metal fans for a very long time, and someone agreed that they had liked heavy metal since they were young children (Larsson, 2015). Some fans became more confident and had less uncertainty when they found that many people liked the same band they liked (Arunrangsiwed & Puxtaran, 2017). Similarly, North and Hargreaves (1999) found that adolescents had a positive feeling towards other people who liked the same music genre. However, some genres



of music were considered as problem music, which means the music that consists of negative contents whether in lyrics or music video (Lozon & Bensimon, 2014). Normally, problem music refers to rap, alternative rock, and heavy metal, and they negatively influenced on their audience, such as in their beliefs, physical behaviors, and emotion (Lozon & Bensimon, 2014). Negative contents such as alcohol, tobacco, and violence could also be found in country music, where Lowell and his colleagues expressed their concern about music impact on young children (Lowell, Grymesa, Hankela, Speera, Custis, & Toblin, 2014).

Outsiders —the outgroup members of the music fandom— viewed problem music negatively, especially for heavy metal fans. This might be because public began to have a negative attitude toward them when the school rampage at Columbine was occurred (Kiilakoshi & Oksanen, 2011). On the other hand, heavy metal fans found that heavy metal music helped reduce their anxiety, suicide thought, and their fear of death, but increase their self-esteem (Kneer & Rieger, 2015). This fans’ attitude toward themselves was opposite from how public viewed them. Hence, North and Hargreaves (2006) tested if problem music use could really cause low self-esteem and self-harm, and their findings revealed that after self-esteem was controlled, problem music use did not cause self-harm. Moreover, self-harm can be widely found among adolescent, especially those who were raised by single parent (Hawton, Rodham, Evans, & Weatherall, 2002).

Music fan identity can be measured by using a measurable variable, which is identity salience. Different levels of identity salience resulted in different behaviors. Music fans with low identity salience might only listen to music on the radio, but fans with high identity salience would collect every album and defend for their favorite artists whenever they were blamed by outsiders (Perkins, 2012; van den Bulck & van Gorp, 2011). Based on the previous example, fans with high identity salience were ready to attack the enemy of their favorite band, but the case of the band Afterhours was different, that fans fought against their favorite rock band for not joining the same festival with other pop bands (Corciolani, 2014). This case was related to high identity salience both as music fans and as people who believe in authenticity of rock music (Corciolani, 2014). As authenticity may not be perceived by outsiders, music fans have to express it by themselves, and this could be seen in the paper of Herrmann (2012). Herrmann (2012) wrote on academic paper to tell the world what real punk music, lifestyle, and identity actually were, because he claimed that previous research studies in this area misunderstood about punk.

According to previous examples, they showed that fans used online channels to communicate to one another, to fight their enemy, to protest against their favorite band’s action, and some used research papers to communicate to outsiders. These are inter-personal communication between people by using actual words contained with opinions and expressions. Krause and Hargreaves (2012) discovered another form of inter-personal communication in music audiences, which is to arrange one’s favorite song into a playlist to show others who viewed the particular playlist. This is how a fan told others who one is by using songs as the medium to convey the message regarding need and emotion (Krause & Hargreaves, 2012). Moreover, intra-personal communication was also investigated in music fan studies. Hermann (2008) interviewed young female adolescents and they disclosed that they wanted to be famous vocalists as well as their idols. Similarly, people who played the game, Guitar Hero, wanted to become guitarists in their real life (Davies & Hemingway, 2014). This intra-personal communication was often found in the research in the area of media effect (Konijn, Nije Bijvank, & Bushman, 2007) and it was called wishful identification.

Emo, as a subculture and a music genre, provided emo children both the identity as a member of subculture and the identity as a music fan. Since these identities were stereotyped by outsiders, it was worth to examine whether this emo stereotype still exists in the current day.

2. Overview of Emo Subculture History

Emo was not originally begun as being a subculture, but it has been a genre of punk music. During 1980s, hardcore punk, a sub-genre of punk, was established. It is harder, faster, and more aggressive than punk. Its lyrics consisted of the problematic political and serious social issue (Miernik, 2013). Later, this genre had transformed to be the emotional hardcore or emocore. The songs contain more emotional lyrics and music regarding friends and family problems (Overell, 2010). Emotional music alone could not make a song emo, because lyrics are very important part to make a song real emo (Hill, 2010a). Before the age of emo became popular, emo bands were called, “indies”, which is the short version of



“independent” or “unsigned” bands. These bands became extremely famous in the age of emo boom, during 2006-2008. Emo subculture was developed and declined within the first decade of 2000s. Some emo bands changed to play other music genres and some were disbanded. Around 2010, emo fans might be totally hopeless. However, music-related media still need to maintain aesthetic of this emo music genre (Bogolian, 2014; Willis-Abdurraqib, 2016). In 2013, some old bands reunited and released new albums, some released new albums without an actual reunion, and some new bands were founded.

These are good news for emo kids, but the age of emo revival does not rise as the form of subculture, but mainly the form of music genre (Arunrangsriwed & Puxaran, 2017).

3. *Emo Stereotype*

The core value of emo kids is that both men and women have an equal right to express their vulnerability (Schmitt, 2011; Strauss, 2012) regardless the general belief of masculinity that men have to be strong and should not express too much emotion. Emo music, as similar as its value, portrays weak and vulnerable men who were hurt by women (Miernik, 2013) and other types of serious life problem. Although this theme of lyrics is not hard to find in Thailand, for the Western culture, the fluidity of gender roles in recent films became an important topic for public discourse (Peltea, 2013). As the result, most male emo kids became the victim of the stereotyping society (Strauss, 2012), that is how they are blamed as gay men, even only some of them really were.

The suicide case of two adolescents and the death of a young girl murdered by a social network user in 2007 caused an unsolved myth regarding emo subculture (Phillipov, 2010). Agenda setting of public media linked the death of these three adolescents to emo subculture (Miernik, 2013), and it misguides the public that all emo kids have alienation (Overell, 2010), depression symptom, suicide thought, and self-mutilation behaviors (Strauss, 2012; Zdanow & Wright, 2012). While these people enjoyed blaming emo kids in online spaces (Phillipov, 2010), they forgot the fact that emotional expression could help adolescents pass through the obstruction in their life (Bailey, 2005), and artistic expression of emo kids such as painting and poetry could also benefit their psychological well-being (Strauss, 2012).

The stereotype built by media and public does not only hurt emo kids (Johansson & Sternudd, 2014), but it was also the message that told the new members of this subculture to act according to. Emo subculture consists of identity, lifestyle, dressing style, music genre, music taste, and other related activities (Overell, 2010; Phillipov, 2010; Strauss, 2012). People who learned about emo stereotype would negatively view an individual right after they notice that an individual dressed as an emo kid. A participant in Strauss’ study (2012) believed that emo kids dressed emo because they wanted to tell the public that they depressed, felt lonely, and had mental problem. Their appearance that the outsider could notice are having black dying hair, black eye liner, black t-shirt and skinny jeans (Ashaalan, Alsukah, & Algadheeb, 2013).

As Emo subculture was first developed from music fandom, Baker, Smith-Adcock, and Glynn (2013) analyzed emo songs to see whether there were self-harm messages included in the lyrics, but they did not find any of them. In contrast, Johansson and Sternudd (2014) reviewed the emo-related video on Youtube, and they found that the outsiders made joke with the vulnerability of emo boys. Based on all these mentioned academic papers, stereotypes created for people with emo identity are about practices of self-mutilation (wrist cutting), depression symptoms, suicide thought, social isolation, deviant behaviors, and men with lack of masculinity.

Emo is a subculture and music genre rarely studied by scholars, and most of them investigated the subculture in the age of emo boom. The present study helped contribute the knowledge in this area since it tested whether emo stereotype, created during the age of emo boom, really triggered a negative life outcome in 10 years later.



METHODS

In accordance to the research papers cited in the literature review and the first researcher’s self-experience in emo online community, the stereotypes of emo kids given by outsiders are to have (1) depression, (2) self-harm behaviors, (3) suicide thought, (4) alienation, (5) (for boys) homoerotic behaviors, and (6) (for girls) prostitute-related behaviors. If a person had all these traits and behaviors, one may rarely have a positive life outcome. Content analysis was used in the current study to collect the data from Facebook profiles of users who have joined emo online community in the last decade (2008).

The sampling method used in this study is a purposive sampling since these users have been Facebook friends of the first researcher for 10 years, during the age of emo boom. In those days, emo kids were likely to post “add me” in emo-related Facebook pages or groups, so it was an opportunity for the first researcher to add them without being rejected or marked as spam. Every time that they accepted friend requests, the researcher would add them into “Emo” friend list. In present days, although no one has been added into this friend list since 2008, this friend list consists of 327 users who have been in emo online community in the age of emo boom. Two coders were provided with the links to access all these Facebook profiles. First, they had to screening out the inactive users in the list of links. Those who had not posted or commented since two months before the coding process would be marked as the inactive users. These inactive users were not included in the analysis.

Two coders needed to code 10 items per each user, and most of them were dichotomous variables (apply=1; not apply=0).

- 1) Gender. Female was coded as 0 and male was coded as 1.
- 2) Having a possible occupation. Users who have possible occupation in the “About” part of their Facebook profile would be coded as 1, possible occupations are the occupations or jobs that they could work in the real world. Impossible occupation was code as 0, such as being an angel, a slave of Satan, a Stormtrooper (Star Wars), or a S.T.A.R. Labs scientist (DC Comics).
- 3) Having a professional occupation. The criteria that two coders agree to use were that professional occupations were the occupations that people intended to show in their resume. Users who have a professional occupation would be coded as 1. Non-professional occupations would be coded as 0, such as a waiter, a salesclerk, and a janitor.
- 4) Using an emo-punk-rock-related profile picture. The users who were coded as 1 needed to have at least one of the followed appearances: black eye-liner, emo hairstyle, leather cloth, gothic or dark apparel, and band/music-related t-shirt or zip-up hoodie.
- 5) Having a professional-look profile picture. The criteria of coding this variable as 1, or having a professional look were that the profile picture needs to be formal enough to use to communicate with others in a middle-class workplace. If the users were in some bars, holding an alcohol drink, having naked appearance, and smoking, they would be coded as 0.
- 6) The use of fake names. Those who used fake names on Facebook would be coded as 1. The coders classified the fake names by noticing its fantasy, coolness, length (too short or too long), and its relationship to some popular media. For instance, one of the users used the name of the guitarist of the band, Avenged Sevenfold as their Facebook name.
- 7) Depression shown in post or comment. This variable would be coded as 1 if the users posted or commented with the words related to the depressive emotions, such as sad, disappointed, and loneliness, in their five latest posts.
- 8) Race. This variable was not the dichotomous one because it contained more than 2 groups. White was coded as 0, yellow was coded as 1, the one from Middle East was coded as 2, the one from India was coded as 3, and black was coded as 4.
- 9) Number of likes in recent posts. The coders would average the number of likes and other reactions (love, haha, wow, sad, and angry) of the 5 latest posts of each user. The likes and other reactions were combined as one value. The researchers of the current study simply called this value, “like”.
- 10) Number of friends. The coders would directly look at the friend section in each Facebook profile. Twenty-



four users did not set their friend list for the public to see.

According to the results of two coders, they had 90.625 percent of agreement. After averaging the results of both, descriptive analysis was used and its results are presented in the findings.

RESULTS

By screening out the inactive users, there were 60 cases left for the final analysis. After averaging the coding results from two coders, the averaged values would be presented as follows:

Table 1
Finding of Descriptive Statistic from 60 Valid Cases

Variable	n	percent (not included missing data)	missing data*
Gender (male)	33	55	0
Possible occupation	38	88.37	17
Professional occupation	36.5	89.02	19
Emo-punk profile picture	23	40.09	2
Professional-look profile picture	37.5	63.56	1
Fake name	9	15	0
Depressive post/comment	7.5	12.50	0
Race			
White	25	41.67	0
Yellow	21	35	
India (a part of South Asia)	7	11.67	
Middle East	4	6.67	
Black	3	5	

* Missing data for the occupation part were those who did not show or type their occupation in their Facebook profile. Some did not have their profile picture and some used photo of something else as their profile picture.

The numbers of female (N=27) and male (N=33) users were relatively the same. Forty-five percent of the cases were female, and 55 percent were male. Nearly half of the cases were white users (N=25; 41.67 percent), and followed by East and South-East Asian users (N=21; 35 percent). These Asian users were generally yellow. Other races were also found. There were 7 users from India, 4 from Middle East, and 3 users were black.

The major part of the analysis was to test whether the emo stereotypes existed. If these young people grew up with depression symptom, loneliness, and tendency to commit suicide, they might not be able to work in professional careers. According to these 60 cases, there was 17 missing data. Among 43 valid cases, 88.37 percent of them were those who posted the possible occupation or job on their Facebook profiles. For other users, they posted fictional or fantasy occupations on their profiles, such as samurai and spaceship pilot. Next, 89.02 percent were those with professional career or occupation, such as, teachers, people in health care industry, engineers, software engineers, entrepreneurs of resort, architects, product and interior designers, and also those who were studying in graduate schools, like Master and Doctoral students. Undergraduate students were coded as missing data, because the coders could not make a decision to code them as professional or non-professional. Fashion model, musician, and photographer were not found, although these occupations had been considered as “cool” for emo subculture.

Other stereotypes that were coded in the present study were the use of emo-punk-rock-related profile picture and fake name. Less than half of these users used emo-punk-rock-related pictures as their profile pictures (40.09 percent). Most of them dressed as general people. Only 15 percent of the users used fake names. Moreover, most users used professional-look profile pictures (63.56 percent), such as the photos taken from workplace, with formal dress, and with famous-place-to-visit background.



The depressive posts and comments were also coded. Only 12.5 percent of these 60 users had depressive posts or comments in their recent communication. For example, some posted bad news and their sadness, and some shared sad quotes on their profiles. The average number of likes in their recent posts was 44.3 likes per a post, and the average number of friend was 1,912.83 friends.

DISCUSSION

Some part of the findings revealed that past emo teens were similar to the stereotype and some were not. Hill (2011a) mentioned that most of emo kids were white male, and there were lack of Asian and black. The valid cases of this study contained a larger number of male users than which of female ones. This could support Hill’s study (2011b). However, it might be because these users have been friends with the first researcher, who, at that moment, did not regularly post her real photos, but artwork. This may cause a lack of trustworthiness for female users to be friends with her. Hill (2011b) also stated that the majority of emo subculture was white. There were also a high number of white users in the cases of this study. However, the number of yellow Asian people was high, too. This could be concluded that social network is like a melting pot, where every race has the right to join any subculture. It is important to note that although the first researcher is yellow Asian, she did not have her portraits on her Facebook before 2010. At that period, the place she lived in was Brooklyn, New York City. This implies that Asian users did not add her as friend because they found that she was also Asian.

The researchers of this study were surprise that some users still used emo-punk-rock-related profile pictures; even they had a professional occupation. This identity might be hard to be changed compared to other choosing-change identities, like fan identity (Arunrangsiwed, Komolsevin, & Beck, 2017). Emo identity is not just a fan identity as a fan of emo music, emo cyberstar, or emo artist, but emo identity is also about lifestyle and appearance (Overell, 2010; Phillipov, 2010; Strauss, 2012). Therefore, some still remained this look for 10 years. These emo-punk-rock-related photos were mostly coded as non-professional profile pictures, but some were coded as the professional ones, like those who applied eye-liner but wearing formal suits and sitting in ones’ offices.

Unlike the stereotype constructed by the outsiders, most valid cases named their professional occupation on their Facebook profile. For the missing data, some people may not post their occupation because they felt that their job was not good enough to show in public place, such as the working-class job. If the missing data was read as the non-professional work, this number was still lower than those with professional occupation. Moreover, most did not lately post anything depressive. These findings were opposite from the stereotype given by the outsiders (Strauss, 2012; Zdanow & Wright, 2012). The researchers were glad for these past emo teens that they could move pass through the negative stereotype and be an important part of the society.

However, no one could confirm that all people who are negatively stereotyped would be able to move forward to the achievement as these past emo teens. Many people could be hurt and negatively prejudiced from the negative stereotype (Lamont, Swift, & Abrams, 2015; Martiny, Gleibs, Parks-Stamm, Martiny-Huenger, Froehlich, Harter, & Roth, 2015). The researchers of this study encourage the teachers, parents, and university lecturers to teach the adolescents to use the stereotype properly. Like, they could use stereotype to understand new culture, to be aware of the politeness of other society, and to prepare well to communicate to new people with different background (Brown, 2016). They should not use stereotype to look down others, and discriminate others based on their unchangeable or force-changed identity. This way does not only help these adolescents to have a better personality, but also help others around them to be judged by what they actually act, not by what they look like.

LIMITATION

The major limitation of the current study is that the cases were not randomly selected from the population. All cases were from the Facebook friend list of the first researcher. In fact, it is hard to randomly select Facebook users who were in online emo community by using other methods. This is because there is no date provided in the action of “like”



on Facebook page. Sometimes, the people who like the particular page are not shown up for the visitors, unless those people were initially friends. Although it seems like there are not many other ways to recruit the cases for this kind of follow-up, there was still another limitation regarding the number of cases.

The emo friend list of the first researcher consisted of 327 users, but after screening out the inactive users, there was only 60 users left in the major analysis. This sample sizes are too small to generalize to the target population. Moreover, the researchers can tell nothing about the inactive users. They may create new Facebook account. For the worst cases, as the constructed stereotype, they may be too depressed and cannot communicate to others in online space. To understand better about the on-going subculture, the future study should conduct an actual longitudinal design. The researchers should have an enough data to follow-up the participants or cases. This will help reduce the drop-out and generate a higher validity for the finding.

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The Participation Herb Garden Development on Ubiquitous Learning of Plan Genetic Conservation Under the Initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University's Students

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ABSTRACT

The purposes of research were to 1) study the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University's students and 2) compare the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University's students to be sort out of gender and faculty. There was quantitative research. The samples were 385 students from the 2nd semester academic year 2017 taken by Taro Yamane. The instrument used in the study was a questionnaire rating scale with the reliability situations at .918. The data collection was statistically analyzed using percentages, mean scores, a standard deviation, independent sample T-test, F-test, and Scheffe test. The findings showed that (1) the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University's students were in a high ranking as follows: Anywhere and anytime learning, computer learning and mobile learning, (2) there was no significant difference in Loei Rajabhat University student's genders and there was a significant difference in Loei Rajabhat University student's faculties.

Keyword: *Participation, Herb garden development, Ubiquitous learning, Students of Loei Rajabhat University*

INTRODUCTION

Her Royal Highness Princess Maha Chakri Sirindhorn carried out her duties in Loei Border Patrol Police School on the continuous concern for promoting education and developing occupation and teacher. Loei Province have 8 Border Patrol Police schools; Banhuaypar, Bannanokpeed, hillmarpable, Bannapor, Banwangchompue, Bannongkhan, Charmratbomrung and Bandmaukao. Loei's adolescents grow up being educated; have an occupation and a good quality of life. The construction of public consciousness on national resources conservation in adolescents is important. The adolescents in Loei Rajabhat University participated the Plan Genetic Conservation under the initiation of Her Royal Highness during 2013 to 2016; Project Planting Sak-Saksiamminon on August 3, 2013, The importance of Genetic Conservation Plan Construction under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn Project at Bannongkhan Border Patrol Police Schools on March 4, 2014, and the participation of Genetic Conservation Plan under the initiation of Loei Rajabhat University's Students Project at 8 Border Patrol Police schools in Loei Province during February to April 2015. There are three learning activities domains; Plan of Genetic Conservation, Plan of Genetic Protection and Plan of Genetic Performance. This academic article responds to Genetic Conservation Plan under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn (Yotcamlue, 2017).



Thailand domains of learning to develop students 5 concepts (Thai Qualifications Framework for Higher Education, TQF: HE); ethics and moral, connective skills, knowledge and interpersonal skills and responsibility and numerical (numerical) analysis, communication, and information technology skills. The role of higher education institutions were public information, participation, transparency and accountability. (Office of the Higher Education Commission, 2015, p.10) Education program must be used whole child. The higher education commission on higher education of students has 3 main: quality social, wisdom and learner and social harmony. The standard of instruction, particularly for the English language, is much lower. Education policy provides students’ knowledge by learning for themselves and education network. (Thailand Ministry of Education, 2002, p.1)

LITERATURE & THEORY

The participation theory (Yukl, 1998). Leadership in Organizational (Sergiovanni, 1982). Ten principles of quality leadership. Educational leadership (Summers & Hyman, 2005). Employee participation and company performance: A review of the literature. Theory of human motivation: biological factor, learned factor, cognitive factor (aroused motive, intrinsic motive and extrinsic motive). (Maslow, 1943, pp.451) The multiple factor theory of decision making and social action was believes and disbelieves (Reeder, 1971). Choice rationality and social theory (Barry, Hindess, 1988) and experience and education (Dewey, .(1963 Perspectives on Social Change (4th ed) (Laver, 1991). Conservation movement (Gifford, (1945

Related Works or Discussion

Gifford(1945) found that the conservation movement in United States of America was the conservation for covering the area and anima and wildlife.

Locke (1690) revealed the social contract and the right to private property precedes the civil law, a supreme power and the division of powers. The social contract was people participation development social together.

Chingmai et al. (2001) studied participation of community development balance. The meaning of people participated in groups can development community: Learning active participation, physical participation, intellectual participation, social participation and emotional participation. People present contents or knowledge for constructivism. The community header village was mixed knowledge, approach and development community for social changing.

Boonsanong Chuikawn et al. (2017) studied fragrant plant in Phethcharawanalai Botanic Garden Phethchaburi Rajabhat University. Phetcharawanalai Botanic Garden harbors diverse groups of plants. The purpose of this study was to investigate fragrant plants in Phetcharawanalai Botanic Garden. In total, 59 species 43 genera, in 21 families were found. Most families represented only 1 or 2 species except Orchidaceae (13 species) Apocynaceae (10 species) Oleaceae (6 species) and Annonaceae (5 species). The important fragrant plants were *Cananga odorata* var. *fruticosa* (Craib) J.Sinclair, *Adenium obesum* (Forssk.) Roem. & Schult., *Kopsia fruticosa* (Roxb.) A.DC. *Plumeria obtusa* L., *Plumeria rubra* L., *Cassia fistula* L. and *Tabernaemontana pandacaqui* Lam. Each plant species, family name, scientific name together with local name were described.

Yotcamlue (2017) studied adolescent caring of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn. Found that Her Royal Highness Princess Maha Chakri Sirindhorn went to duties in Loei Border Patrol Police School on continuous concern for promote education, development occupation and teacher. Loei Province have 8 Border Patrol Police Schools; Banhuaypar, Bannanokpeed, hilmarpable, Bannapor, Banwangchompue, Bannongkhan, Charmratbomrung and Bandmaukao. Loei’s adolescent grow up on educated, occupation and good quality of life. The importance of public consciousness on conservation national resources construction in adolescent. The adolescents of Loei Rajabhat University participation of Plan Genetic Conservation under the initiation of Her Royal Highness during 2013 to 2016.



Tabthai (2017) studied species diversity and medicinal properties of herbal plants of Ban Sang Krui School, Phang Khon Sub-District, Phang Khon District, Sakon Nakhon Province. The species diversity and medicinal properties of herbal plants of Ban Sang Krui School, Phang Khon Sub-district, Phang Khon District, Sakon Nakhon province. Herbal samples were collected from temporary sample plots from 24 samples of plot study (10x10 m.) for plant community study. Forty four species of herbal plants were found. They were divided into 26 families. The highest number of herbal plants found in this area was *Randia horrida* Roem & Schult. (457 plants) or 26.5%. The comparison of medicinal properties from traditional healers and from reference found that the species with the same properties and the same used part is *Polyalthia lateriflora* (Blume) King. The bark has diuretic medicinal properties, *Pavetta humilis* Hook. f. leaf has medicinal properties to kill parasites, *Syzygium cerasiforme* (Blume) Merr. & L.M. Perry. Leaf has medicinal properties of nourish hair, *Erythrina fusca* Lour. Root has medicinal properties of solve fever, the bark has medicinal properties of conjunctivitis. This study can be acquired as knowledge base on guideline for the establishment of a school botanical garden. Local learning resource is created within school and community. In order to make the community aware of the importance of the use and conservation of forest, which is a valuable resource to be preserved.

Hongsawong (2017) studies the trend towards the utilization of herb in document Sakon Nakhon Province medicine for healing abscess: the comparative study of traditional medicine from the stone inscription in Wat Phra Chetuphon Vimolmangklararam Wat Pho, Thailand. This qualitative research was studied with two aims; to assemble body of theoretical knowledge for abscess explanation and the analysis gives the following results trend towards the utilization of abscess medicine in Ancient Document Sakon Nakhon Province Medicine and comparative study of Traditional Medicine from Wat Pho medicine. The key body of theoretical knowledge for analyzing the research results was concept in the mode of Explanatory Model EM. The two main results are as the followings. 1. There are two causes of abscess ; 1.1 three main factors are Air Element, Liquid Element and “ Earth Element”, emerging from germs which make patient’s within the body inflamed and ruined, and 1.2 the minor factors are problems from one type of important element in patient’s body, imbalanced processes of the elements affecting “ Fire Element”, 2. The curing procedure found in this research are; 2.1 Selecting treatment method with within the symptom in scripture 2.2 Four groups are Selecting treatment method with herb 2.3 Recipe are YEN taste for Ancient Documents and Recipe are SUKOMYEN taste and YEN taste for Wat Pho Scripture 2.4 related rituals. The formulas are abscess medicine from eight types of Traditional Medicine from Ancient Documents in 2013-2014 and twenty-one types of Traditional Medicine from The stone Inscription in Wat Pho. The trend towards the use of Wat Pho medicine is higher than ancient documents.

Narmburi (2018) Ubiquitous learning make education fast. Student can learn anywhere and anytime from computer and mobile phones. Technology: digital contents to make education method easy and various.

Munarsa (2017) studied biodiversity of macro fungi in plant Genetic Conservation Project Area Rajamangala University of Technology Isan, Nakhon Ratchasima Province. A biodiversity study of macro fungi was carried out in Plant Genetic Conservation Project Area Rajamangala University of Technology Isan, Nakhon Ratchasima Province. 270 species of macro fungi were found. Were identified 255 species. There are 83 genera, 35 families and 2 phyla. The Agaricaceae is the most common family with 53 species. Next, 47 species of Polyporaceae, 23 species of Tricholomataceae, 16 species of Xylariaceae, 14 species of Marasmiaceae, 11 species of Russulaceae and Coprinaceae, 10 species of Ganodermataceae, 8 species of Boletaceae, 6 species of Hymenochaetaceae, 5 species of Clavariaceae, 4 species of Lycoperdaceae, Auriculariales, Cortinariaceae and Pluteaceae, 3 species of Bolbitiaceae, Sclerodermataceae and Meruliaceae, 2 species of Sarcosomataceae, Inocybaceae, Nidulariaceae, Cantharellaceae, Geastraceae and Pleurotaceae, respectively. While Geoglossaceae, Hysteriaceae, Entolomataceae, Hydangiaceae, Schizophyllaceae, Hymenogasteraceae, Paxillaceae, Dacrymycetaceae, Phallaceae, Albatrellaceae and Tremellaceae are the very scarce families with one species per family. The macro fungi were found in dry dipterocarp forest and



mixed deciduous forest during the high rainy season from August to September. The result of this study would be used for study guide about biodiversity of macro fungi in Plant Genetic Conservation Project Area Rajamangala University of Technology Isan, Nakhon Ratchasima. Data will be useful for conservation and future utilization (Office of Forest resources Management, 2018). Maintainance of the quantity and quality of natural resources.

The project of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn in the past to present. The conservation for Human welfare and natural resources treatment.

Overall of this related worksor will make Thailand citizen of plan genetic conservation for approach in community folkway. The Thailand resource will protection from heart of Thailand citizen to implementation. The adolescent caring continuous of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn.

METHODS

The scope of the study with respect to their detail was the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University’s students. The data was gathered through the use of a questionnaire participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University.

Data was analyzed through the use of the following statistical tools: Frequency count, percentage, means, a Standard Deviation, independent sample t-test, and F-test. The population of this study of 10,114 students Loei Rajabhat University were studying semester of 2017 (academic year). The sample of were 385 students to be taken by Yamane (Yamane, 1967) and stratified random sampling. The questionnaire was administered to 30 students at the Loei Rajabhat University. Part 1; personal factors of the respondents, part 2; gathering the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University `s students. Likewise, to measure the level of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University, the researcher set the scale arbitrarily (Srisaard, 2000).

4.51 - 5.00 = Very High [VH]

3.51 - 4.50 = High [H]

2.51 - 3.50 = Moderate [M]

1.51 - 2.50 = Low [L]

1.00 - 1.50 = Very Low [VL]

For data collection procedure, there were data gathering procedure; the researcher analyzed the questionnaire of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University.

Data gathering was done by the researcher who utilized the questionnaire for the purpose. After the questionnaires were given, the researchers calculated and tabulate the results. All data in the tables were primarily taken from the questionnaire of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University’s students.



RESULTS

Table1

Summary mean rating of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University 's students

Items	\bar{X}	S.D.	D.R.	Level
1.Anywhere and anytime learning	4.08	0.43	H	1
2.Mobile learning	3.76	0.36	H	3
3.Computer learning	3.92	0.39	H	2
Total	3.92	0.29	H	

Legend: VH = Very High, H = High, M =Moderate, L = Low and VL= Very Low

Table 1 presents the overall mean ratings (\bar{X} = 3.92) is “high” of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of students Loei Rajabhat University. This means that; anywhere and anytime learning (\bar{X} = 4.08), computer learning (\bar{X} = 3.92) and mobile learning (\bar{X} = 3.76).

Table 2

Compare of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University's students to be sort out of gender.

The participation herb garden development on ubiquitous learning	Male		Female		t	p-values
	\bar{X}	S.D.	\bar{X}	S.D.		
1. Anywhere and anytime learning	4.11	0.44	4.05	0.42	1.344	0.180
2. Mobile learning	3.79	0.36	3.73	0.35	1.505	0.133
3. Computer learning	3.94	0.36	3.91	0.41	0.650	0.516
Overall	3.95	0.28	3.90	0.30	1.541	0.124

*p< .05

Table 2 shows that there was no significant difference as a whole of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of students Loei Rajabhat University different gender.



Table 3

Compare of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University’s students to be sort out of faculty.

Items	SS	SS	df	MS	F	p-value
1.Anywhere and anytime learning	Between Groups	7.596	4	1.899	11.355	0.000
	Within Groups	63.379	379	0.167		
	Total	70.974	383			
2.Mobile learning	Between Groups	2.395	4	0.599	4.926	0.001
	Within Groups	46.069	379	0.122		
	Total	48.464	383			
3.Computer learning	Between Groups	5.534	4	1.383	9.850	0.000
	Within Groups	53.232	379	0.140		
	Total	58.765	383			
Overall	Between Groups	3.681	4	0.920	11.789	0.000
	Within Groups	29.584	379	0.078		
	Total	33.265	383			

*p< .05, ** p< .01

Table 3 presents that there was a significant difference at the level of .01 of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of students Loei Rajabhat University different faculty.



Table 4

Table 4 Mean rating compare of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn of Loei Rajabhat University 's students.

The participation herb garden development on ubiquitous learning	\bar{X}	Faculty				
		Education	Science and Technology	Humanities and Social Science	Management Science	Industrial Technology
		3.95	4.04	3.77	3.92	3.88
Education	3.95	-	0.09	0.18-	0.03-	0.07-
Science and Technology	4.04	0.09-	-	0.27-	0.12-	0.16-
Humanities and Social Science	3.77	0.18	0.27	-	0.15	0.11
Management Science	3.92	0.03	0.12	0.15-	-	0.04-
Industrial Technology	3.88	0.07	0.16	0.11-	0.04	-

Table 4 presents that the students in Science and Technology Faculty was high of the participation herb garden development on ubiquitous learning of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn more than Education Faculty, Management Science Faculty, Industrial Technology Faculty and Humanities and Social Science Faculty.

CONCLUSION AND FUTURE WORK

Ministry of Education will support the budget for project herb garden development of Loei Rajabhat University's students will promote academic services for knowledge sharing on ubiquitous learning of plant genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn. In the future, promote this project in public and private organization and national and international. The students' union and participation on social contract of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn. Public Administration Program, Department of Social Science, Humanities and Social Sciences setting moral and public mind in learning activities. In the future teacher Loei University will study: quality research of plan genetic conservation under the initiation of Her Royal Highness Princess Maha Chakri Sirindhorn, quality research of ubiquitous learning development in Loei Rajabhat University. Her Royal Highness Princess Maha Chakri Sirindhorn need development education in Loei Area and promote Plan Genetic Conservation Activities learning 3 domains; conservation, protection and performance in Loei border patrol police school to develop the personnel and plant genetics resources for the maintenance of plant varieties and for the development to be advantageous for the farmer and business section of the country.

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Figure

1

Local wisdom educate Herbal knowledge

Source of figure : Itsariyaphon Chaikulap January 22, 2018



Figure

2

Herbal plants of Loei Rajabhat students group and Bannanokpeed border patrol Police schools

Source of figure : Itsariyaphon Chaikulap January 22, 2018





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Figure 3

Development herbal garden of Loei Rajabhat students group and Bannanokpeed border patrol Police schools
Source of figure : Kalaya Yotcamlue January 23, 2018



Figure 4

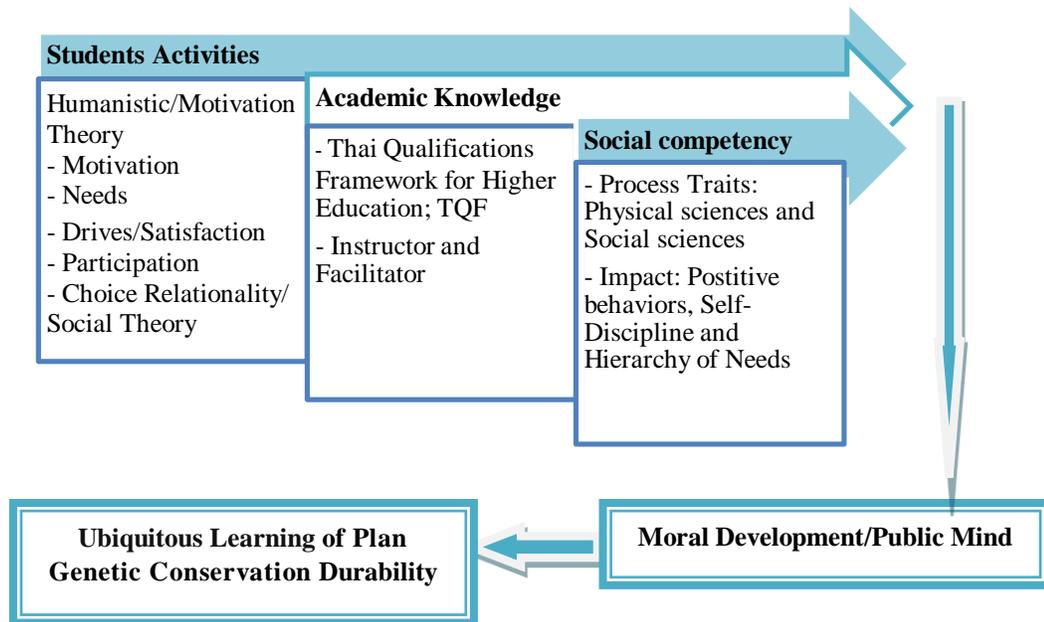
Development herbal garden of researcher, teacher and students of Bannanokpeed border patrol Police schools
Source of figure : Itsariyaphon Chaikulap January 23, 2018





Figure 5

The Participation to development social
Source of figure : Kalaya Yotcamlue (2018)





Female Student Experience in a Male-Dominated Aviation Program

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ABSTRACT

Traditionally, a number of academic disciplines have been notoriously associated with a male-dominated environment, notably in Science, Engineering, Technology and Mathematics (STEM). This male-dominated educational environment inevitably affects the learning experience of female students. The present paper examined the learning experience of female students in an Aviation program in Australia where significant increase of female students was achieved in a five-year period, jumping from a 13% representation in 2013 to over 22% in 2018. Through a survey to 53 Aviation female students, the perception of being a female, the learning experience, and the female-specific learning support in a male-dominated educational environment are elucidated. The findings revealed that the concerns associated with being a female and female underrepresentation in the Aviation programs were sometimes recognised among female students. Additionally, there were three categories of experience associated with female students in a male-dominated educational program. Some of the negative experience was around sexual harassment from male leaders, depreciation from lecturers and male fellow students and perception of inferiority. The negative experience resulted in undesirable impact on female students' wellbeing, the formation of defensive behaviour and actions, and a thought of school leave. The positive experiences included a certain “feminist righteousness”. Interestingly, a great proportion of surveyed female students reported neutral experience, claiming that gender-based interventions in Aviation educational environment indeed aggravate gender discriminations in the field. The respondents also assessed general support, gender-based support and mentoring programs for female students in a male-dominated environment. Support sourced from staff and university was evaluated very positively among female students, followed by assistance among cohorts. With regards to gender-based support, the increase of social and professional associations, together with the improvement of female voices in leadership positions were argued. Finally, in mentoring programs, a gender-equality perspective was expected for mentors and experiential learning was recommended to guide the program design. Contributions of this study lie in the areas of learning experience and feminist educational support.

Keywords: *Gender Studies, Student Engagement and Satisfaction, Learning Experience, Mentoring, Female Aviation Students*

1. INTRODUCTION

Student experience of higher education is widely studied in order to enhance student satisfaction and their retention, better prepare student transition to workforce, and have student career ready (Bates & O'Brien, 2013; Wilcox, Winn, & Fyvie-Gauld, 2005). Most frequently, student experience is assessed through a factor-based approach. For instance, Wilcox et al. (2005), in their study of evaluating social support for first-year students in the UK, argued that key influences on student retention include the



learning and teaching strategies and student integration socially and academically. Likewise, Peltier, Schibrowsky and Drago (2007) interrogated factors affecting the online learning experience of students, consisting of (a) student-to-student interactions, (b) student-to-instructor interactions, (c) instructor support and mentoring, (d) lecture delivery quality, (e) course content, and (f) course structure. However, the learning experience of students could be contextualized to different educational environments. Indeed, there are discrepancies of student experience whilst learning in single-sex-dominated academic fields in terms of their academic identity, self-esteem and feeling of depression and loneliness. These discrepancies undoubtedly affect student overall learning satisfaction. Thus, illuminating student experience in specific educational environments, such as in gender-dominated educational programs, is worthwhile. With a case study of an Australian university, this study investigates female students' learning experience in a male-dominated learning environment in Aviation programs.

This paper aims to examine:

- 1.1 How do female students perceive about themselves in a male-dominated program?
- 1.2 How do female students experience in a male-dominated environment?
- 1.3 What types of support are specific for female students in a male-dominated environment?

2. LITERATURE REVIEW

Gender studies in students' learning experience have been widely recorded in the literature of higher education. Gender and gender differences inevitably affect the learning experience of students, resulting in their retention as well as career development. Pelch (2018) argued that important emotional differences between men and women have the potential to influence retention in STEM. Likewise, the study of Chen, Hsieh and Huang (2011) indicated that learning satisfaction of females in male-dominant fields was negatively correlated with their feeling of depression whereas that of males in female-dominant fields was positively correlated with their academic identity and self-esteem. It is concluded that, gender difference in learning experience, associated with gender imbalance in certain fields (STEM is an exemplar), could negatively affect the learning experience of students of inferior gender.

The knowledge of gender-based research on gender-dominated professional environment is mainly contributed by research on the perceived experience of female colleagues in male-dominated occupations and workplaces (and vice versa). Particularly, in the realm of male-dominated professional environments, previous studies focused on the participation of women faculties (notably in leadership positions) in aviation higher education (Ison, 2008); the indicators of career success of women in the financial industry (Ledwaba, 2016); reasons against a job retention (Germain, Herzog, & Hamilton, 2012). Lesser attention has paid to evaluate gender-based experience in gender-dominated educational programs. Given by the linkage between education, career orientation and career satisfaction (Frome et al., 2006), and student experience and their retention (Wilcox et al., 2005), research on student experience in gender-dominated educational environments is worthwhile. For instance, tailor-made academic support helps students to be career ready through anticipating and confidently overcome gender barriers (i.e., the obstacles that relate to female working in masculine jobs or male in feminine professions). The study of Germain et al. (2012) stated that gender barriers cause the job-quit of women employees in the aviation industry. Thus, attempts to improve student experience in gender-dominated occupations could arguably leverage student retention to the field and their job satisfaction (Pelch, 2018). Within the scope of this study, research on female students in male-dominated education programs is investigated, through the case study of Aviation educational programs.

Aviation has been widely defined as a male-dominated sector. Male domination in aviation is well reflected in education and in workforce. Regardless of constant boosts in the enrolled quantity of women students in aviation educational programs as well as the percentage of women colleagues in the



aviation industry, gender imbalance in aviation still prevails. In the study of Ison (2008), women accounted for 10.1% of faculty members in aviation higher education faculty, 6.0% of pilots and 3.8% to 7.0% of non-pilot aviation positions in USA. It was also argued in this study that such the ratio reflects a positive change in terms of gender balance in aviation compared to previous records in the field. In the surveyed Aviation program, it has recorded significant increase of female students in a five-year period, jumping from a 13% representation in 2013 to over 22% in 2018. However, considering these figures, Aviation is still a male-dominated sector, in both education and workforce.

Among few studies focused on the educational aspects of aviation, none of it touches the topic of gender and learning experience. For instance, the study of Clark (nil) emphasised on factors affecting the decision of selecting a four-year-post-secondary- commercial aviation program. Likewise, Bates and O'Brien (2013) investigated the significance of vocational-focused, professional-developed support in Aviation programs through the program Mentoring Aviators Through Educational Support (MATES). Accordingly, in this paper, the researchers attempt to improve the learning experience of female students in aviation educational programs. In particular, the study is focused on evaluating the perceived learning experience of female aviation students and how to improve such experience in orientation towards program satisfaction, job ready and career pathway availability.

At a different aspect of the literature review, previous research aimed to highlight gender-based discrepancies in the different aspects of gender-dominated professional environments (i.e., workplaces, occupations, educational programs). Accordingly, both male and female respondents are subject to an investigation (see Chen et al., 2011; Pelch, 2018). This both-sided perspective, irrespective of its potential in identifying a comprehensive interrogation to the research topic, is incapable of indicating impacts specialised for those of inferiorities (such as female students in Aviation program, as in this study). The present paper aims to address this issue by empowering the viewpoint of female students in male-dominated aviation educational programs.

3. METHODOLOGY

This paper used an emic perspective to encapsulate the perceived experience and expectations of female students. In particular, the second and third authors, who are female, took in charge of conducting the data collection and analysis. As the purpose of this study was to examine the experience of female students studying in the male-dominated aviation program, an online survey was used as the data collection method. The online survey created by Google Forms was the most suitable data collection tool which allowed participants to remain entirely anonymous. The additional benefit of online survey was convenient accessibility for all online students that are not necessarily geographically located in Brisbane. The survey had four main parts: (1) respondents' demographic attributes; (2) level of satisfaction with chosen aviation program, including questions related to negative experiences; (3) level of support that female students receive at aviation program; (4) personal testimonials that show support or a lack of support and how potential mentorship program could support the female student cohort. The survey used both qualitative and quantitative questions.



4. DATA ANALYSIS

4.1. Respondent Demographics

From the 121 emails sent to female students being enrolled under Aviation programs, 53 responses were received, and these provided the sample size for the analysis. Of the 53 respondents, there were 26 students of Bachelor of Aviation, followed by 16 students of Bachelor of Aviation Management, eight students from the Master in Aviation Management, and three students of the Graduate Diploma of Flight Management (flight school). The majority of respondents was first year students (56.6%). Most of them were full-time, on-campus students (75.5% and 73.6% respectively). The respondents’ age mainly ranged between 19 and 21 years old (43.4%).

Table 1: Respondents’ demographic attributes

Characteristics	N	%
<i>Program</i>		
Bachelor of Aviation	26	49.1
Bachelor of Aviation Management	16	30.2
Graduate Diploma of Flight Management	3	5.7
Master in Aviation Management	8	15.1
<i>Year</i>		
First year	30	56.6
Second year	14	26.4
Third year	9	17.0
<i>Enrolment mode</i>		
Full time (usually undertaking 40CP in the current trimester)	40	75.5
Part time (less than 40CP in the current trimester)	13	24.5
<i>Study mode</i>		
Mixed Mode	1	1.9
On-campus	39	73.6
Online	13	24.5
<i>Age group</i>		
16-18 years old	5	9.4
19-21 years old	23	43.4
22-24 years old	12	22.6
25+ years old	13	24.5



4.2. The Concerns of being a Female and the under Representation of Females in Aviation Programs

When asked about the perception of being a female as a kind of concern in Aviation education programs, the result showed that 58.5% of respondents did not regard being a female is a concern (see Table 2). Only 15 of 53 respondents likely acknowledged the concern.

Table 2: Being a female is a kind of concern in a male dominated program

Female underrepresentation in Aviation education environment	N	%
<i>The concern of being a female</i>		
Completely disagree	17	32.1
Somehow disagree	14	26.4
Neutral	7	13.2
Somehow agree	15	28.3
<i>The concern of underrepresentation of females in a male dominated environment</i>		
Completely disagree	14	26.4
Somehow disagree	7	13.2
Neutral	6	11.3
Somehow agree	19	35.8
Completely agree	7	13.2

However, the issue of representation of female students in the programs was recorded diversely among surveyed female students. In particular, 49% of respondents commented a concern about the underrepresentation of female students, contrasting to 39.6% of those who rejected this concern. This contradiction was reflected in Table 2.

4.3. Perceived Barriers for Female Students in Male-Dominated Programs

Female respondents reported that different learning disadvantages were affected by gender imbalance in their educational programs. Barriers associated with female students in Aviation programs encompassed the availability to opportunities, the opportunities to be themselves, accomplishment recognition, sexual connotation, unwelcomed body contact. A summary of these experiences is visualized in Table 3 and their investigations are illustrated in the following details.



Table 3: Female students' learning experience in Aviation programs

	Completely disagree		Somehow disagree		Prefer not to rate		Neutral		Somehow agree		Completely agree	
	N	%	N	%	N	%	N	%	N	%	N	%
Female students have fewer opportunities than male students in the program	24	45.3	14	26.4	-	-	4	7.5	8	15.1	3	5.7
It is more difficult for female students than male students to "be themselves" in the program	16	30.2	10	18.9	-	-	8	15.1	11	20.8	8	15.1
Female students have to be more accomplished in my program than male students to be recognized	11	20.8	13	24.5	2	3.8	4	7.5	11	20.8	12	22.6
Unwelcome sexual connotations glances, gestures, or comments usually occur at the program	28	52.8	9	17.0	3	5.7	5	9.4	5	9.4	3	5.7
Unwelcome conscious body contact or unwelcome suggestions usually occur at the program	34	64.2	8	15.1	3	5.7	2	3.8	4	7.5	2	3.8



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It is shown in Table 3 that the recognition of achieved accomplishment and the opportunities to be themselves are among the most perceived disadvantages hindering female students in Aviation programs (with 43.4% and 35.9% of respondents agreeing these barriers, respectively). For example, female students experienced the underappreciation from lecturers and male fellows because of their gender. Following personal experience of respondents exemplifies this negative experience.

“Going to a specific lecturer I felt kind of “brushed off” when I wanted clarification with an assignment. They didn’t necessarily make eye but wasn’t the first time that I had to make myself “known” for them to acknowledge me”. (Bachelor of Aviation, third-year, full-time, on-campus, 22-24 years old).

“When I introduced myself as a flight attendant (mind you I’m petite and blonde also!) I heard laughs and scoffs coming from male colleagues in the lecture hall”. (Master in Aviation Management, second-year, part-time, online, 25+ years old)

Contrastingly, sexual connotations and unwelcomed body contacts were least perceived as barriers among surveyed female students. In particular, 79.3% of respondents rejected unwelcome conscious body contact or unwelcome suggestions and 69.8% disagreed with the existence of unwelcome sexual connotations glances, gestures, or comments in programs. However, these kinds of negative experience, particular verbal mistreatments, were still happened to some female students. For examples,

“There have been several sexist jokes made airside, by other pilots (non-students or instructors), when training with a female instructor. Most times the female instructor laughed along with the jokes, which was puzzling. To me, that was an example of how women can’t afford to break any ties with male superiorities or peers even if they’re victim to ridiculing/belittling/condescending behaviour, because of their pre-disposed disadvantage within general aviation”. (Bachelor of Aviation, third-year, part-time, online, 22-24 years old)

“Some male students (who are leaders in various clubs/roles) tend to speak about females in a way that is sexualising and demeaning”. (Bachelor of Aviation Management, first-year, full-time, on-campus, 19-21 years old)

With regards to the availability to opportunities, 71.7% of respondents did not acknowledge the existence of inequalities between males and females with regards to the availability to opportunities. Meanwhile, only 20.8% of respondents admitted that female students have fewer opportunities than their male fellows in Aviation programs.

As a result of such negative experience, female students’ well-being was negatively affected. In particular, hurts, loss of the feeling of belongings were among the impact on students’ well-being.

“I am no longer comfortable to approach these leaders [who are leaders in various clubs/roles] to join clubs or ask for support”. (Bachelor of Aviation Management, first-year, full-time, on-campus, 19-21 years old)

“That was hurtful at the time and I will never forget the way it made me feel”. (Master in Aviation Management, second-year, part-time, online, 25+ years old)



“It felt like I shouldn't have belonged there, or I was a nuisance”. (Bachelor of Aviation, third-year, full-time, on-campus, 22-24 years old).

Leaving school because of gender-related problems was also recorded by four respondents of the survey.

Table 4: Leaving school because of gender-related problems

	N	%
Completely disagree	41	77.4
Somehow disagree	8	15.1
Somehow agree	2	3.8
Completely agree	2	3.8
Total	53	100.0

Additionally, defensive behavior and actions became prevailed among female students to address gender-based discrimination in their programs. In particular, female clubs

“After a sexist remark at an inter house flight event, some of the female aviation leaders organized a female only afternoon at the flight school to create a “sisterhood” within the cohort, I thought that was a really good show of support”. (Bachelor of Aviation Management, first-year, full-time, on-campus, 19-21 years old)

“It made me more determined to shine and excel at my program”. (Master in Aviation Management, second-year, part-time, online, 25+ years old)

It was also indicated from Table 3 that all of the above-mentioned barriers were regarded as not relevant by a majority of respondents (more than 50%). Thus, it becomes plausible to further investigate female students’ experience other than negative experience. Indeed, the surveyed female students also perceived positive experience because of their gender. Additionally, the respondents recorded no gender-based experience in Aviation programs as a way to achieve gender equality in the field. The following subsections illustrate these kinds of experience.

4.4. Positive Experience for being a Female Student in Male-Dominated Programs

Alongside with disadvantages that female students experienced in Aviation programs, the respondents also reported gender-based positive experience within a male-dominated educational environment. This positive experience was mainly related to feminist righteousness. In particular, female students could see some chances in their study and even in the industry owing to female scarcity in the field of Aviation.

“I have spoken to some female students who seem to think that they are entitled to more than the male students simply because they are females in a male dominated industry. I think it is



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very important to highlight how there is a real chance that females in aviation will experience sexism in the industry (whether studying or in their career)”. (Bachelor of Aviation, first-year, full-time, on-campus, 19-21 years old).

4.5. No Gender-Based Discrimination Experienced in Aviation Programs

Through open-ended questions included in the survey, respondents expressed no difference between male and female students with regards to their learning experience in Aviation programs.

What I love is how everyone treats each other simply as 'students' who are all in the same boat and I feel that females are not given special treatment by the boys, and most of the girls do not walk around acting like they are owed anything or are more deserving of opportunities or praise than any other student. (Bachelor of Aviation, first-year, full-time, on-campus, 19-21 years old)

According to these students, gender-based support (or experienced lack of support) was indeed gender discrimination and exacerbated the conventional belief of female students as inferiorities in the Aviation sector.

“Female students do not need 'extra support'. The level of support given to males is the same as females. We are not disadvantaged in any way and this type of gender pandering only sets us back”. (Bachelor of Aviation Management, third-year, full-time, on-campus, 19-21 years old)

“The existing systems are good enough from a point-of-view of someone who doesn't want special attention or considerations for being female”. (Master in Aviation Management, first-year, full-time, on-campus, 25+ years old)

4.6. Support for Female Students in Male-Dominated Programs: General Support and Gender-Based Support

It was also included in the study to evaluate support perceived by female students in their Aviation programs. In particular, general support and gender-based support were subjects to the investigation.

With regards to general support, the support was sourced from fellows; Aviation academic staff, Aviation administrative staff, and the University (see Table 5). In general, a majority (50.9%) of respondents said that the availability of support was satisfactory. In particular, the support from Aviation administrative staff, the University and Aviation academic staff was evaluated highest among the respondents (77.4%, 63.6%, and 71.7% respectively). Within cohorts, female students received support from both female and male fellows equally (58.5%). However, it is not indicated in this study that whether the support from cohorts, the department and university for female students were gender-based.



Table 5: The availability of general support for female students in Aviation programs

	Completely disagree		Somehow disagree		Prefer not to rate		Neutral		Somehow agree		Completely agree	
	N	%	N	%	N	%	N	%	N	%	N	%
Generally speaking, if I experience a particular difficulty, I have somewhere or somebody to speak openly about it with.	4	7.5	8	15.1	3	5.7	11	20.8	7	13.2	20	37.7
My fellow female classmates provide me with complete support.	1	1.9	3	5.7	3	5.7	15	28.3	8	15.1	23	43.4
My fellow male classmates provide me with complete support.	-	-	5	9.4	2	3.8	15	28.3	10	18.9	21	39.6
The Aviation lecturers/ sessionals/ instructors provide me with complete support.	-	-	5	9.4	-	-	10	18.9	16	30.2	22	41.5
The Aviation administrative staff provide me with complete support	-	-	3	5.7	-	-	9	17.0	15	28.3	26	49.1
University services provide me with complete support.	1	1.9	3	5.7	-	-	10	18.9	13	24.5	26	49.1



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Apart from general support, which by no intention to be gender-based, female students were also asked to female-specific support what they expect to see in their programs. Accordingly, through open-ended questions, expected support relating to associations and gender discrimination-free learning environment were identified.

The respondents suggested the availability and increase of professional and social associations. In terms of professional associations, female students wished to have more opportunities to meet with women in the industry for connections and inspirations, as reflected in the following comments:

“More opportunities and/or events to join or be associated with Women who work in the aviation and engineering industry”. (Bachelor of Aviation Management, third-year, full-time, on-campus, 22-24 years old)

“Having female guest speakers that have been successful in the aviation world”. (Master in Aviation Management, first-year, full-time, on-campus, 22-24 years old)

“Perhaps an industry focused event specifically for female students where we can network with aviation industry leaders (especially any female ones).” (Bachelor of Aviation, first-year, full-time, on-campus, 22-24 years old)

Additionally, they also recommended the increase of female-solely clubs and increased voice of female leaders in aviation/pilot-specific clubs and in University-wide associations.

“A female only Mates sessions run maybe once a month”. (Bachelor of Aviation, first-year, part-time, on-campus, 19-21 years old)

“I hope there is a special group for girls majoring in aviation, so that every girl can participate in it”. (Bachelor of Aviation Management, first-year, part-time, on-campus, 19-21 years old)

“Female only social days so we can socialise and also discuss issues and have a support network established”. (Graduate Diploma of Flight Management, third-year, full-time, on-campus, 22-24 years old)

“A lot of the leaders of the flight groups and aviation clubs seem to be male. I think it would be fare if out flight leaders were one of both genders as this would make them more approachable”. (Bachelor of Aviation, first-year, full-time, on-campus, 19-21 years old)

“More female talkers at MATES. More of the Flight Leaders and Leadership Committee to include females”. (Bachelor of Aviation Management, third-year, full-time, on-campus, 22-24 years old)

With a goal to create a gender discrimination-free learning environment, the respondents requested perception changes in the field. In particular, through outreach activities, awareness raising was suggested necessary to encourage school students to enroll in Aviation. Awareness raising was also



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essential to change closed-minded people, particularly males in the Aviation sector. According to a respondent, this was a fundamental step to create a gender discrimination-free culture in the field.

“More engagement with, and encouragement to younger women (such as school students) to consider a career in Aviation in the first place”. (Bachelor of Aviation, third-year, part-time, online, 19-21 years old)

“I feel that in order to truly make the change, continue to support the women students but mentor the male students in acceptable cultural norms as far as gender-based balance is concerned. You may support the women and raise their strength as much as can be humanely done but if the behaviour remains the same from male students then what really is changing apart from building resilience to discrimination? Those values and essentially that cultural shift will translate itself into the greater aerospace industry overall”. (Master in Aviation Management, second-year, part-time, online, 25+ years old)

4.7. Mentoring Programs as Professional Support and their Orientation towards Female Students in Aviation Programs

Mentoring programs are regarded among professional support in educational environment. Due to the industry-oriented, vocational nature of Aviation programs, mentoring programs are essential to equip students with professional skills and competence to be industry-ready. Accordingly, expectations about mentoring programs that are supportive for female students in a male-dominated environment was asked among respondents and the findings were presented in the following. In particular, the mentors and design of mentoring programs were identified, in which their attributes being aligned with female students were highlighted.

Mentors

The respondents suggested that the mentors of mentoring programs in male-dominated education programs such as Aviation should possess the characters: Hold a perspective of gender equality; are able to understand female students in terms of their mindset, attitudes and beliefs; are females and are advisers/inspirers. According to the respondent, a mentor with these characters could encourage female student’s confidence and motivation and push their future career success.

“A mentor that lives by and applies an authentic mind set of equality and belief in equality themselves in the abilities of men and women. Creating an even further barrier will not assist women of any age. Differences in attitudes and hence self believe, and mind set of women needs to be understood by any mentor in such a critical role for an aviation student's success”. (Bachelor of Aviation, second-year, full-time, on-campus, 25+ years old)

“A mentor who is assigned to assist the females who need it can reassure them that they have every right to want to pursue a career in aviation and that they are no less valuable or suited to aviation than men. I think that a mentor should work to build up females' confidence in themselves so that they have the tools required to be able to achieve the very best they can in the industry without feeling like they don't belong or are not good enough”. (Bachelor of Aviation, first-year, full-time, on-campus, 19-21 years old)



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“Sometimes when you experience sexism in the industry it can be very demotivating, so it might be nice to counteract it with a kick-butt inspirational woman [mentor] to take advice from”. (Bachelor of Aviation, third-year, part-time, online, 22-24 years old)

Program Design

Mentoring programs, according to the respondents, should encompass a wide range of objectives to its goals, such as career related assistance, course-related issues, workplace-related advice, and work-life balance. To this end, mentoring programs was argued to provide female students a comfortable environment to ask questions and for assistance. Additionally, story-telling was most recommended by the respondents to run mentoring programs. Particularly, experience from other female students and the stories of success of the mentors or other industrial females were most preferred. Through this design, female students could feel empowered, gain lessons, and acquire advice. Following quotations reflected these insights.

“I’d like to feel empowered after learning of their experiences and success in a male dominated industry”. (Bachelor of Aviation, first-year, full-time, on-campus, 19-21 years old)

“I would hope to learn from other’s experiences [to acquire] recommendations and help with prevention rather than a cure”. (Bachelor of Aviation Management, second-year, full-time, online, 25+ years old)

“It would help gain confidence in my ability to succeed in this industry and give me an insight in how other women have overcome any difficulties relating to the male dominance in the industry”. (Bachelor of Aviation, first-year, full-time, on-campus, 19-21 years old)

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Metacognitive Strategy Preference in Vocabulary Learning among Thai EFL Learners at Nakhonratchasima Rajabhat University

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ABSTRACT

This study aimed to investigate the use of metacognitive strategies in vocabulary learning by the first year students from the Faculty of Management Sciences at Nakhonratchasima Rajabhat University, Thailand. Precisely, it tried to examine Thai EFL learners' use of metacognitive strategies including planning, monitoring and evaluating in vocabulary learning. To achieve this aim, an adapted version of the questionnaire was used as the instrument to study what metacognitive strategies in vocabulary that EFL learners at the university frequently used to discover the meaning of English vocabulary. The sample groups were 53 first year Management Sciences students. There were 26 students (experimental group) and 27 students (control group) selected according to the purposive sampling. The research instruments used in the study was metacognitive strategy in vocabulary learning questionnaire. The statistical methods used for analyzing the collected data were descriptive statistics (mean (\bar{x}), a standard deviation (SD), and Independent Sample t Test). The findings of the study revealed that the evaluating strategy were the most preferred both by the control group and experimental group. In general, the use of metacognitive strategies in vocabulary reported by the control group and experimental group that there was a significant difference at $p < .05$.

Keywords: *Metacognitive Strategies, Vocabulary Learning*

INTRODUCTION

This article intended to present an overview of metacognitive vocabulary strategies (MVS) preferences of EFL learners. Critically, there are still problems of using traditional methods in learning vocabulary. This generally means that most of teachers in the language classroom do not realize whether these methods can be facilitative in vocabulary teaching. It is important to stress that teachers should be the first people who are interested in teaching vocabulary. In fact, teachers do not only assist their students to acquire a large number of words that suit to their grade levels, but also seek strategies to help them remember words in their memory appropriately (Carter & McCarthy, 1988). In trying to accomplish vocabulary learning, they should bring effective technique of teaching vocabulary learning strategies in order to help students to create beneficial activity and task easily. Thus, teachers need to pay attention to cope with metacognitive vocabulary learning strategies because they are obviously shown as better ways to fulfill the gap of students' vocabulary knowledge. Likewise, Bandura (1986); cited in Heidari; Izadi and Ahmadian (2012) mentioned that self-efficacy affects students' effort to choose challenge work or activity that they can manage it or avoid to do it. Essentially, students can learn how to invest their lives to gain more about vocabulary knowledge by themselves because teachers could not teach all words all the time outside the English classroom. Indeed, EFL



teachers should focus more on determining the effective ways to increase self-efficacy for the students because self-efficacy deals with a strong influence on putting effort or doing challenge thing by themselves.

LITERATURE & THEORY

Vocabulary Learning Strategies

It is widely acknowledge that to accomplish language learning, it is important to stress that vocabulary strategies are significant classifications for students enhancement of English language learning. Obviously, “Vocabulary learning strategies are a part of language learning strategies which in turn are a part of general learning strategies” (Nation, 2001, p.217). The development of vocabulary learning strategies are the key concept that extends to the successful of vocabulary learning for language learners. So far, a number of well-known scholars have attempted to classify vocabulary learning strategies that their consideration deals with vocabulary learning process in terms of L1 and L2 learner characters and concerned on study focus (Fan, 2003). Due to the strategies for combining with vocabulary learning, from this viewpoint, to increase vocabulary knowledge, vocabulary learning strategies has special aspect on autonomous and suitable ways to integrate vocabulary knowledge (Kafipour & Naveh (2011). Believing in the significance of vocabulary learning strategies used in vocabulary, vocabulary learning strategies will assist students discover the meaning and remember more than some other strategies. Considering the importance of vocabulary learning strategies, it is believed that if students do not use vocabulary learning strategies, they could not become proficient autonomous learner (Mokhtar, Rawian, Yahaya, Abdullah & Mahamed, 2009). Hence, there is a value in being able to utilize a variety of strategies. To illustrate, in the classroom, vocabulary learning strategies are associated with the strategies to accomplish in doing things such as doing language activities

Metacognitive Strategies (MET)

Beyond the definition of metacognitive strategies, there are two different classifications of metacognitive strategy. O’Malley and Chamot (1990) broadly classified three categories: planning, monitoring and evaluating. Oxford (1990) classified into three groups: 1) centering one’s learning, 2) arranging and planning one’s learning and 3) evaluating one’s learning. The classifications of metacognitive strategies are provided by well-known scholars; they can be adopted and applied to all language skills. Certainly, the definitions and classifications of metacognitive strategies of O’Malley and Chamot (1990) are more widely accepted and adopted by many researchers in many educational studies in terms of metacognitive strategy training model.

Relevant Studies and Discussion

To illustrate, Nation (2001) regards the vocabulary learning strategies which are divided into three general class planning, sources, processes. Therefore, if teachers know the significance of metacognitive strategies, they could help students become effective learners, thus they need to provide effective strategies use into their daily classroom activities. Beyond the significance of strategies training, there are many beneficial strategies for foreign language learning. There are well known experts emphasizing the metacognitive model of strategic learning e.g. in Oxford (1990) or O’Malley and Chamot (1990), the model includes plan, monitor and evaluation. In the study of Ping & Siraj (2012) suggested that students need to focus on active use of both cognitive and enhance metacognitive awareness and manage how to use strategy for improving (self-efficacy) and motivation in vocabulary learning. Due to the importance of metacognitive vocabulary strategies, this present study revealed metacognitive vocabulary strategy preference of Thai EFL students, especially for Nakhonratchasima Rahabhat University (NRRU) students.



Objective of the Study

The main purpose of this study is to determine metacognitive vocabulary strategy preferences of EFL students.

METHODS

The quasi-experimental design is used in order to conduct the study in a natural setting. The participants were separated into two groups: The experimental group (26 students), and the control group (27 students). The sample groups were 53 first year Management Sciences students. There were 26 students (experimental group) from computer science and 27 students (control group) from management science who were selected according to the purposive sampling.

The questionnaire of metacognitive used in the study was to elicit what types of vocabulary learning strategies were used by the participants and to investigate the student’s attitudes toward metacognitive vocabulary strategies. The questionnaire was translated to Thai and was constructed using the Five Point Likert Scale and. It was designed as close-ended questions: Questions related to the attitudes toward metacognitive vocabulary learning strategy. The validity of questionnaire was checked by three specialists and tested for qualification in terms of the index of item objective of congruence IOC (0.5-1). The data obtained from questionnaire was analyzed with the computation software for statistical analyses (SPSS). An independent t-test was used to analyze the comparison of vocabulary learning strategies of two sample groups.

RESULTS

The data obtained from the questionnaire were analyzed using a quantitative analysis. What follows were the results of the data analysis.

Table 1: The comparisons of metacognitive strategies used by the students in the control group and experimental group

Type of MVS	Control		Experimental		t	df	Sig (2-tailed)
	M	SD	M	SD			
Planning	3.82	0.756	4.30	0.644	2.45**	51	.018
Monitoring	3.93	0.696	4.30	0.545	2.14**	51	.037
Evaluating	4.13	0.672	4.63	0.566	2.96**	51	.005
Overall	3.97	0.647	4.39	0.494	2.64**	51	.005

* p<.05

As shown in Table 1, as mentioned, the questionnaire was divided into three parts of metacognitive vocabulary learning strategies used, to discover the kinds of metacognitive vocabulary learning strategies used by students while learning, students were assigned to answer the questionnaire at the end of the study. Data from the questionnaire was analyzed for the mean scores and a standard deviation, and t-test analysis was applied. As the table 1 illustrated the mean of the experimental group was significantly higher than the mean of the control group



$t(51)=2.64, p<0.01$, two tailed. The variance of the two groups was significantly different ($p < 0.05$). To be specific, the order that the experimental group preferred to use metacognitive vocabulary strategies was as follows: Evaluating 4.63 (SD=0.566), followed by Planning 4.30 (SD= 0.644) and Monitoring 4.30 (SD=0.545) and the control group preferred to use Evaluating 4.13 (SD= 0.672), followed by Monitoring 3.93 (SD= 0.696) and Planning 3.82 (SD=0.756). The results as shown in the table 1, for the students in experimental group, they demonstrated the highest use of three sub-strategies followed by evaluating, planning and monitoring, specifically evaluating strategies in which the students reported as the best strategy. The increase in the use of metacognitive vocabulary strategies could signify that the strategies have an impact on the abilities of the students in experimental group leading to enlarge in metacognitive vocabulary strategies use. While the results show the difference of all three sub-categories of metacognitive vocabulary strategy training increased. In fact, the number of metacognitive vocabulary learning strategies usage of the students in control group also reported the most used of evaluating but monitoring reported as the lowest used.

The results of the comparisons of the metacognitive strategies used by the students in the control group and experimental group in the table 1 indicated that the two groups have the same choices of using metacognitive vocabulary strategies. Moreover, it can be asserted that majority of students tended to use a greater variety of metacognitive vocabulary strategies and that they had positive attitudes towards metacognitive vocabulary strategies.

CONCLUSION AND FUTURE WORK

It is also important to highlight these findings of this study were in line with the results of Diaz (2015) conducted training in metacognitive strategies for students' vocabulary improvement by using learning journals. The study showed that the students could utilize their vocabulary learning process effectively when using different vocabulary strategies and figuring the connection of metacognitive strategies. According to O'Malley and Chamot (1990), the integration of metacognitive strategies effectively influences vocabulary knowledge. Thus

Moreover, the results of the current study are similar to the research done by Wanpen, Songkoontod, Nonkhetkhon (2012), which focused on the employ of technical vocabulary learning strategies. The results showed that students who used technical vocabulary learning strategies outperformed students who insufficiency strategies knowledge, these results imply that students who see merit in strategies can use them effectively. Ellis (1994), as cited in Morin & Goebel (2008) mentioned that in fact, successful students use metacognitive knowledge in order to select various learning strategies that raise their second language acquisition. Through this study, the results implied that two groups of students reported widely used the strategies; however, this study did not separate them into two groups: successful and unsuccessful.

The metacognitive vocabulary strategies of the students should be regarded as a needed aspect of vocabulary learning that deserves future consideration. Undoubtedly, the preference of the students can be shaped by their teachers. Thus, students should be trained, as well as a move toward training independent and active learners should be considered. Through this study, it is hoped that teachers will effectively train and lead their students to greater development in learning vocabulary. However, the results of this study cannot actually be generalized to other students. Therefore, it is suggested that further study involving metacognitive should investigate in a larger sample group. Moreover, in this study only quantitative data collection was used. It is recommended that in future work qualitative data should be collected and interpreted in order to get more detailed thoughts and feelings of the students related to their strategy preferences, which will assist to uncover the problematic concept of vocabulary learning in the EFL contexts.



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English Phrasal Verbs from a Film Script “Titanic”

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ABSTRACT

This study aimed to 1) survey the phrasal verbs occurrences from a movie script “Titanic” and 2) analyze the structure of the phrasal verbs occurrences from the movie script “Titanic”. The research methods were 1) studying the movie script online– Titanic (355 pages), 2) determining the data format, 3) classifying all verbs into Form no. 1 Verbs from the movie script “Titanic”, 4) classifying phrasal verbs into Form no.2 Phrasal verbs from the movie script “Titanic”, 5) analyzing the data with the phrasal verb structures and 6) concluding summarizing and reporting the results. The results showed that 1) there were 470 heads of phrasal verbs in the movie script “Titanic”. The most frequent verbs appeared in the movie were: Look, go, and come, (106, 65, and 61), while there were some verbs appearing only 1-3 times. For separable and inseparable phrasal verbs, there were 42 separable phrasal verbs occurring; mostly were put on (22 times), put in (11 times). There were 69 inseparable phrasal verbs occurrences; most of them were come down (14), look out (12), and look up (11). 2) For phrasal verbs classifications: they are- 1) VERB+PREPOSITION as in look after, 2) VERB+ADVERB as in give up, and 3) VERB+ADVERB+PREPOSITION as in get down to. There are also phrasal verbs with variety of prepositions: back down to, boil up around, bound over to, break out of, and burst out onto. Phrasal verbs with two verbs as in *get set up for the uplink*, and phrasal verbs with pp-and-pp as in *come up to look at*.

Keywords: *English Phrasal Verb, Film Script-Titanic*

INTRODUCTION

Nowadays, Thailand has devoted much attention to use English in communication. Economic growth in the country mostly comes from foreign tourism, English movies, or national business groups. In English, there are several areas of vocabulary and grammar that are extremely difficult for learners of English as a foreign language to master.

Phrasal verbs play an important role in a variety of English sentences. Normally, a verb is one of the main parts of sentences elements. Kurtyka (2001) reported that phrasal verbs are undoubtedly one of the perennial sources of confusion and frustration. They are widely viewed as particularly difficult for English language learners to master; these difficulties are (1) lack of transparency in meaning and (2) what Side (1990) calls the [semantically] random nature of the particles (Condon, 2008). Side (1990) also mentioned that they create special problems, partly because there are so many of them, but also because the combination of verb and particle seems so often completely random.

Phrasal verbs structures are not familiarized by the non-native speakers or learners of English as Thai. The interference of L1 affects the students, confused when using the English phrasal verbs. Thai people do not just practice in making English sentences or vocabulary, on other hand; you need to focus on knowing a phrasal verb which is a verb combined with preposition. There is exactly difficult learning for second language person. For instance, lack of transparency in meaning, English language is always changeable in meaning; some phrasal verb has the same meaning such as “sit in” means take a seat but some phrasal verb does not, such as “beef up” which means something that makes you stronger, not raise beef.

Titanic Movie

This research studied a lot of phrasal verbs mainly focusing on the situation in the movie script from “Titanic”. It is an American romance and disaster film set in 1997, directed, and co-produced by James Cameron.



He wrote it based on a true history about an ocean shipwreck named RMS Titanic departing Southampton on 10 April 1912 to New York City with capacity of 3,547 passengers and crews. The cruise sank in the North Atlantic Ocean on 15 April 1912 because of colliding with an iceberg. It is one of the deadliest maritime disasters. The main movie stars are Leonardo DiCaprio and Kate Winslet casted as Jack Dawson and Rose Dewitt Bukater. The movie displays about an old woman telling her life in the whole ship story from departure until the death to her granddaughter when young Rose met an artist named Jack Dawson. Many people have been brought to tears by the movie and it won 11 Oscars in 1998.

With the lack of ability in using phrasal verbs for L2 learner and its difficulties, it is quite interesting to study the phrasal verbs through a favorite movie.

Objectives

This research aims to:

1. Survey the phrasal verbs occurrences from movie script “Titanic”
2. Analyze the structure of the phrasal verbs occurrences from a movie script “Titanic”

Background of the Study

Thim (2012) explained the term - phrasal verb found originally by Smith in 1925 attributed Henry Bradley (1845-1923) as:

The term ‘phrasal verb’ was suggested to me by the late Dr. Bradley; not, as he wrote, that he was satisfied with it, or would not welcome any alternative that he could feel to be an improvement. But, as he said, one cannot write of these verbs without some workable description, and although the word ‘phrasal’ is perhaps objectionable in formation, it fills a want, and is sometimes indispensable. (Smith, 1925, p172).

He also mention that Kennedy’s (1920) study recorded it as ‘verb-adverb combination’ in the Modern English while Harrison’s (1920) study is ‘separable prefixes’ in Old English.

Phrasal verb is combination of a verb and one or two particles. These particles are either prepositions or adverbs or both. A phrasal verb has a meaning that is different from the meaning of its original verb. It has a verb and words such as ‘on, up, in, out, over, off, with, down, away, about, after’. It may consist of two words or three words e.g. Give up, bring up, look after, looking forward to, put up with, look down upon.

There are two types of phrasal verbs: 1) separable phrasal verb and 2) inseparable phrasal verb or non-separable phrasal verb (Duckworth, 2000 p.182; Fuchs & Bonner, 2000, p.232-236; Maurer, 2000 p.279) as follow:

Separable Phrasal Verbs:

Not separated			
Subject	Verb	Particle	Direct Object
He	dreamed	up	the idea.

Separated			
Subject	Verb	Direct Object	Particle
He	dreamed	the idea	up.



c) With a noun as object VERB + NOUN OBJECT + ADVERB

put	|	your toy	|	away
bring	|	the matter	|	up

Particle can be either adverb or a preposition:

- A) Look the word up. > Look it up. Up is an adverb.
- B) Look up the street. > Look up it. Up is a preposition.

A = find the meaning from the dictionary

B = tell us where to look

This is a difference in the stress pattern:

VERB+ADVERB : stress on the particle or equally on verb and particle
 VERB+PREPOSITION : stress on the verb

3. VERB+ADVERB+PREPOSITION [VERB+ADVERB] +[PREPOSITION+OBJECT]

<i>Noun object</i>	look	|	down	|	on	your enemies
<i>Pronoun object</i>	look	|	after	|	on	them

Meaning of phrasal verbs is 1) have their *literal meaning* or only a slightly *transferred meaning*. (Allsop,1986)

- ADVERB : He sat down. (literal meaning)
He tore the notice down. (slightly transferred)
- PREPOSITION: Look into the microscope.
Look into the matter. (=investigate) (slightly transferred)

Some of them, we cannot easily deduce from the meaning of the parts:

- He was **brought up** by his aunt. (bring up: to raise a child)
- The old man **passed away**. (pass away: to die)
- We **sat off** for London. (set off: to start journey)
- She is trying to **give up** smoking. (give up: to quit)
- Never **look down upon** poor people. (look down upon: to consider inferior)



Sometimes a phrasal verb can have several meanings: **Take off**

- If you want to see thing clearly, **take your glasses off.** (Remove)
- When does the plane **take off?** (Leave the ground)
- He’s wonderful mimic: he can **take off** most people. (Impersonate)
- Do you think this book will **take off?** (Be a success)

However, they can nominalize in these word formations in English. These are the options (for a phrasal verb V prt with V’verb’ and prt “particle”):

V prt	<i>drop-in</i>
V prter	<i>drop-inner</i>
V erprt	<i>dropper-in</i>
V erprter	<i>dropper-inner</i>
Prt V	<i>dropper-inner</i>
Prt Ver	<i>outbreak</i>
Vingprt	<i>bystander</i>
	<i>dropping in</i>

The various positions of the suffix-*er* in the formation of agent nouns is particularly remarkable. It shows the relationship of syntax and morphology. Suffixes of deverbal nominalization are attached to the verbal stem, preceding the inflectional ending and the nominal order is “lexical stem - derivational suffix -inflectional suffix.

Definitions and types of phrasal verbs can be explained in many ways from the past. It mainly classifies separable and inseparable ones including meanings, structures and word formation.

METHODS

- 1) Study the movie script – Titanic (355 pages) from https://m.watch32hd.co/watch?v=Titanic_1997
- 2) Determine the data format.
- 3) Classify all verbs into Form no. 1 Verbs from the movie script “Titanic”.
- 4) Classify phrasal verbs into Form no.2 Phrasal verbs from the movie script “Titanic”.
- 5) Analyze the data with the phrasal verb structures.
- 6) Conclude; summarize and report the results.

RESULTS

The results of the study are as following: phrasal verbs occur from movie script “Titanic” and the structure of the phrasal verbs from movie script “Titanic”.

4.1 Frequency of English Phrasal Verb Occurrences from a Movie Script “Titanic”

There are 470 head of phrasal verbs in the movie script “Titanic”. The most verbs are look, go, and come, (106, 65, and 61) while there are a group of verbs appears only 1-3 times as shown in Table 1.



Table 1: Frequency of heads of phrasal verbs occurrences in the movie script “Titanic”

Heads of phrasal verb	Frequency of occurrences
look	106
go	65
come	61
get	49
run	44
pull	40
put	38
push	21
step	10
hold, move	8
fall, take, turn, walk	7
find, keep, pick, sit	6
send	5
break, catch, give, land, light, pass, throw	4
boils, call, drag, figure, hand, hang, join, pay, play, rush, shut, stay, still, spread,	3
rip, back, bring, cry, draw, drive, fill, let, lie, plunge, resolve, screw, show, speed, splash, stand, start, see, wheel, work, lay	2
awake, bump, burst, carry, chat, check, clear, climb, lose, count, covered, crack, descend, fade, hurry, hike, insist, jump, load, make, pours, puff, pump, rest, ring, set, settle, shore, sign, sink, slap, sleep, stir, stumble, switch, bounds, talk, tear, cut, tire, tower, tuck, wash, win, knock, nod, point, rail, reach, shove, grow	1



4.2 Types of Phrasal Verbs

4.2.1 Separable phrasal verbs occurrences

There are 42 separate verbs occurring; put on (22), put in (11) are the most ones and they are some occurring only once -as shown in Table 2.

Table 2: Frequency of Separable phrasal verbs occurrences

Head of Separable phrasal verbs	Frequency of occurrences
put on	22
put in	11
put up, pull back, push back	4
get back, pull off, pull away, push through	3
get out, get up, get off, keep on, hold in, pull through, pull out of, put down,	2
clear up, drag out into, draw out of, drive away, give away, hand over to, hand out, hold out, keep up, pick up, point at, pull from, pull down, pulley around, pull through, push forward, put back in, put onto, rail in, rip off, run up to, see on, slap down on, take into, turn on in, and wheel out	1

4.2.2 Inseparable phrasal verbs occurrences

There are 69 non-separate verbs occurrences; they mostly are come down (14), look out (12), and look up (11) and shown some are just once occurrence as shown in Table 3.

Table 3: Non-Separate verbs occurrences

Head of inseparable phrasal verbs	Frequency of occurrences
come on	14
go up	12
come up	11
come down	9



look out, look up, run through, run up, go down, go out	7
push through	6
fall back, pull out, run down, shut up, get into, get up, go back, pick up, pull back from, push in on	4
boils up, come into, come out, get back, give up, go on, go under, light up, look back, step back, run on, rush out, step up to, walk away, wind up	3
break out, come back, come through, cry out, drag down, figure out, hold on, get in, get away, join in, land at, land on, let out, hang on, look down, look up, move on, play out, pay out, pull away from, pull out, resolve into, run across, run back, run out, run along, run down, rush out, send out, show off, step into, turn away, turn into, wake up	2
awake at, back down, back away, back on, block out, bound over to, break into, break away, bump into, burst out onto, call for, call up, call out, come off, come along, come in, come forward, crack up, cut away from, descend away into, draw up, drive down,	1



fade away from,	
fall out, fall into, fall off,	
fill out,	
get at, get down, get out of, get over, get off with,	
go away, go by, go through, go off, go in, go up, go back,	
grow up,	
hand on, hand out about , hang up,	
hiking up,	
hold out, hold up,	
hurry up,	
insist on,	
keep out,	
lay out,	
lie down with,	
load down with,	
look away, look back, look for, look from, look over,	
lie on,	
make out,	
move in, move off, move over, move along,	
nod off,	
pay out,	



pass over,	pass away,	
pick up,		
plunge back into,	plunge into,	point out, pour into,
puff up,		
pull down by,	pull up,	
pump out of,		
push forward,		
push on,		
put on,		
reach out to,		
rest on,		
rip off,		
run in,	run into,	run off, run out,
rush out of,		
screw up,		
see over,		
sign over,		
sit over,		
sleep in,		
speed up,		



spill over,	
splash down,	
spread out,	
stand out of, stand back,	
start off, start up,	
stay back, stay on out, stay up,	
step down into, step back, step in,	
switch off,	
take out, take off,	
talk through,	
throw away, throw up,	
tie up in,	
turn back to,	
walk away through, walk over to, walk through, walk up,	
win out	

4.2.3 Phrasalverb with variety of prepositions

There are 106 separable phrasal verbs with variety of prepositions shown in Table 4.



Table 4: Occurrences of Separate verbs with variety of prepositions

Heads of phrasal verb with variety of prepositions			
back <u>down to</u> ,			
boil <u>up around</u> ,			
bound <u>over to</u> ,			
break <u>out of</u> ,			
burst <u>out onto</u> ,			
catch <u>up on</u> ,	catch <u>up to</u> ,	catch <u>up with</u> ,	
climb <u>down into</u> ,			
come <u>back down</u> ,	come <u>back for</u> ,	come <u>back on</u> ,	come <u>back over</u> ,
come <u>back to</u> ,	come <u>down from</u> ,	come <u>down on</u> ,	come <u>in with</u> ,
come <u>out into</u> ,	come <u>out of</u> ,	come <u>out on</u> ,	come <u>up at</u> ,
come <u>up to</u> ,	come <u>up with</u> ,		



cry out with,
cuts away from,
 descend away into,
 drag out into,
 drive away from,
 fade away from,
 fall off into,

get away from,
 get out of,

get back into,
 get set up for,

get off with,
 get up onto,

get up to,

go back to,
 go down to,
 go up on,

go back up,
 go out of,
 go up to,

go down by,
 go out on,

go down into,
 go over to,

hand out about,

hand over to,

hold on with,

join in with,

lay out in,

lie down with,

load down with,
 look down at,
 look out onto,

move out of,

look around for,
 look down from,
 look up at,

look around in,
 look down into,

look back at,
 look forward to,

plunge back into,

look up from,

look up in,

pull away from,
 pull back to, pull
up onto,

pull back from,
 pull down by,
 pull up out of,

pull back in,
 pull off of,

pull back onto,
 pull out of,

push back into,

push back through,

push in on,

push through by,

put back in,

put back on,

put off in,

reach out to,



run <u>back to</u> ,	run <u>out of</u> ,	run <u>up to</u> ,	
rush <u>out of</u> ,	rush <u>out onto</u> ,		
spread <u>out from</u> ,			
stand <u>out of</u> ,			
step <u>back to</u> ,	step <u>down into</u> ,	step <u>out into</u> ,	step <u>up to</u> ,
take <u>away by</u> ,			
tie <u>up in</u> ,			
turn <u>away from</u> ,	turn <u>back to</u> ,	turn <u>on in</u> ,	
walk <u>away through</u> ,	walk <u>over to</u> ,	wheel <u>around to</u> ,	wind <u>up in</u> ,

4.2.4 Phrasalverbs with two verbs

There is a phrasal verb with two verbs occurrence as the Table 5 below.

Table 5: The example of phrasal verb with two verbs occurrence

Subject	Two verbs
Lovett, now	<u>get set up for</u> the uplink.

4.2.5 Phrasal verbs with pp-and-pp

There are phrasal verbs with pp-and-pp occurring; they are to, and. The sentences are shown in the Table 6 below.

Table 6: The examples of phrasal verbs with pp-and-pp

Subjects	Phrasal verbs with pp-and-pp
TIGHT ON JACK as his eyes	<u>come up to look at</u> her over the top edge of his sketchpad.



Moving methodically she	<u>turns her body and gets her heels onthe white-painted gunwale, her back to the railing, facing out toward blackness.</u>
Mir One	<u>goes up and overthe bow railing, intact except for an overgrowth of reticles draping it like mutated Spanish moss.</u>
The stern	<u>goes up and up,past 45 degrees, then past sixty.</u>
They	<u>nod and run off,searching for a way around the deckhouse.</u>
After a moment, he	<u>turns and walks away.</u>

CONCLUSION

Phrasal verbs in English are not easy for L2 learners. They occur many times in many reading texts or in daily life documents. They also have different forms: Separable and inseparable phrasal verbs and different compounds: VERB+PREPOSITION, VERB+ADVERB, and VERB+ADVERB+PREPOSITION. Moreover, there are phrasal verbs with a variety of prepositions: Back down to, boil up around, bound over to, break out of, and burst out onto. Finally, there are phrasalverbs with two-word verbs as in *get set up for the uplink* as well as phrasal verbs with pp-and-pp as in *come up to look at*.

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Improvement of the Service Process Based on Lean Concept: A Case Study of Salaya Hospital

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ABSTRACT

This study is the first phase of the research in improving the service process using the lean concept in a case study of Salaya Hospital. The purposes of this study were to investigate the service process of Salaya Hospital, and to frame the concept of improving the service process of Salaya Hospital. The lean concept was used to help the analysis of work process more effective. It also provided a framework for improving new services. The participants consisted of a director, two doctors, five nurses and three staff members. The data were analyzed by employing descriptive statistics. The results of the research showed that the new version of work process that has been improved by utilizing information from the relevant stakeholders. It was presented that the 27 processes of the traditional version which took an average of operating time of 71 minutes was re-managed into 20 processes which took an average of operating time only 35 minutes. The lean concept could help the process analysis to reduce time-consuming and processes to make the process more efficient. In terms of process improvement, the downtime was as high as 36 minutes or 49.30 percent of the reduction in work time as a result of improvements by reducing redundant processes, reducing waiting times, and integrating a consistent workflow into the same process. The process did not produce value, nor cut out. Moreover, it could handle the problem of waste service. The results could also see the needs, and be able to know the basics of quality management through the hospital service improvement study. Besides, the results of this study can have strong, effective as well as suitable effects for the context of the organization.

Keywords: *The Lean Concept, Hospital, Quality Improvement*

INTRODUCTION

The hospital is considered an organization that provides services as well as a professional organization (professional bureaucracy). The introduction of professional knowledge is regarded as a base for the development of lean organizations to integrate the different types of organizations to achieve the goal of developing quality services by considering the safe-and-fast deliver, low operating cost and moral ethics values in the view of the service recipient. According to the review of existing standards and the developing sustainable services, the goal remains the same, and seems to be better than ever. To improve the delivery of patient care, governments and health-care institutions adopted quality improvement methods that had been developed over decades earlier in manufacturing industries. Many health-care practitioners are either unaware, or are inexperienced about the effects of these practices and whether they are successful in health care (Goggin & Cohen, 2015).

In the development of service system, the quality management is necessarily concerned in an organization. Many researchers have an idea to apply the concept of lean management and development to apply for quality



improvement, especially the service of Salaya Hospital. In order to have efficient work processes, it should utilize existing resources to create value for customers, as well as add value and reduce waste meanwhile the concept and the goal of the hospital are still remained. Moreover, for the continuous development of lean, the objective is to reduce administrative costs and to focus on eliminating unnecessary duties. The basic idea is that keeping the flow of the process is ongoing, and for the benefit of the patients, lean thinking is a continuous process management tool which empowers organizations. Considering the operation of responding the needs of customers or patients in the hospital, the lean system will play a role in creating value in the service by eliminating wasted processes throughout the entire process. This leads to a reduction in service costs and positive results for the hospital. At the same time, the importance of quality service delivery is also emphasized. Wattanapachat Montri (2011) studies the case study approach in describing lean concepts in nursing quality development, and claims that the hospital is one of five participating pilot hospitals where the lean concepts in the development of nursing service quality were used, and the results can be categorized into three phases including in phase 1: Initiation of the project; 1) persuasion of the Institute of Productivity; 2) public relations policy throughout the organization; 3) perceived problems, benefits and participation; 4) training to see the real. In phase 2: implementation phase is to apply the lean concept into developing quality nursing services; 1) Establishing a lean committee to teach; 2) Motivating to succeed; 3) Using the lean concept to improve the quality of nursing services; the concept has five subordinate steps as follows; 3.1) Finding the problem together; 3.2) Looking for value; 3.3) Flowing seamlessly; 3.4) Delivering when needed; 3.5) Continuously improving to develop the process; 4) Internalizing to stimulate development; 5) Organizing the stage; 6) Evaluating the follow-up development; 7) Continuously learning and developing. In phase 3: lean implementation phase is used to improve nursing service quality. 1) Service recipients are satisfied; 2) Stimulation of new ideas; 3) Investigation of opportunities for continuous improvement; 4) Actual conduct from all around.

RESEARCH OBJECTIVES

1. To study the services process of Salaya Hospital
2. To frame the concept of improving the services process of Salaya Hospital

RESEARCH METHODOLOGY

This research attempted to improve the process of hospital services by applying the concept of lean to the hospital. The research process consisted of six following steps including:

- Step 1: Study and collect basic information related to the lean concept of organizational development
- Step 2: Review the literature or related research papers
- Step 3: Study the image. Incorporation of work processes in the hospital supply chain case study
- Step 4: the Governance Use the lean concept.
- Step 5: Conclusion of the research.
- Step 6: See Figure 1

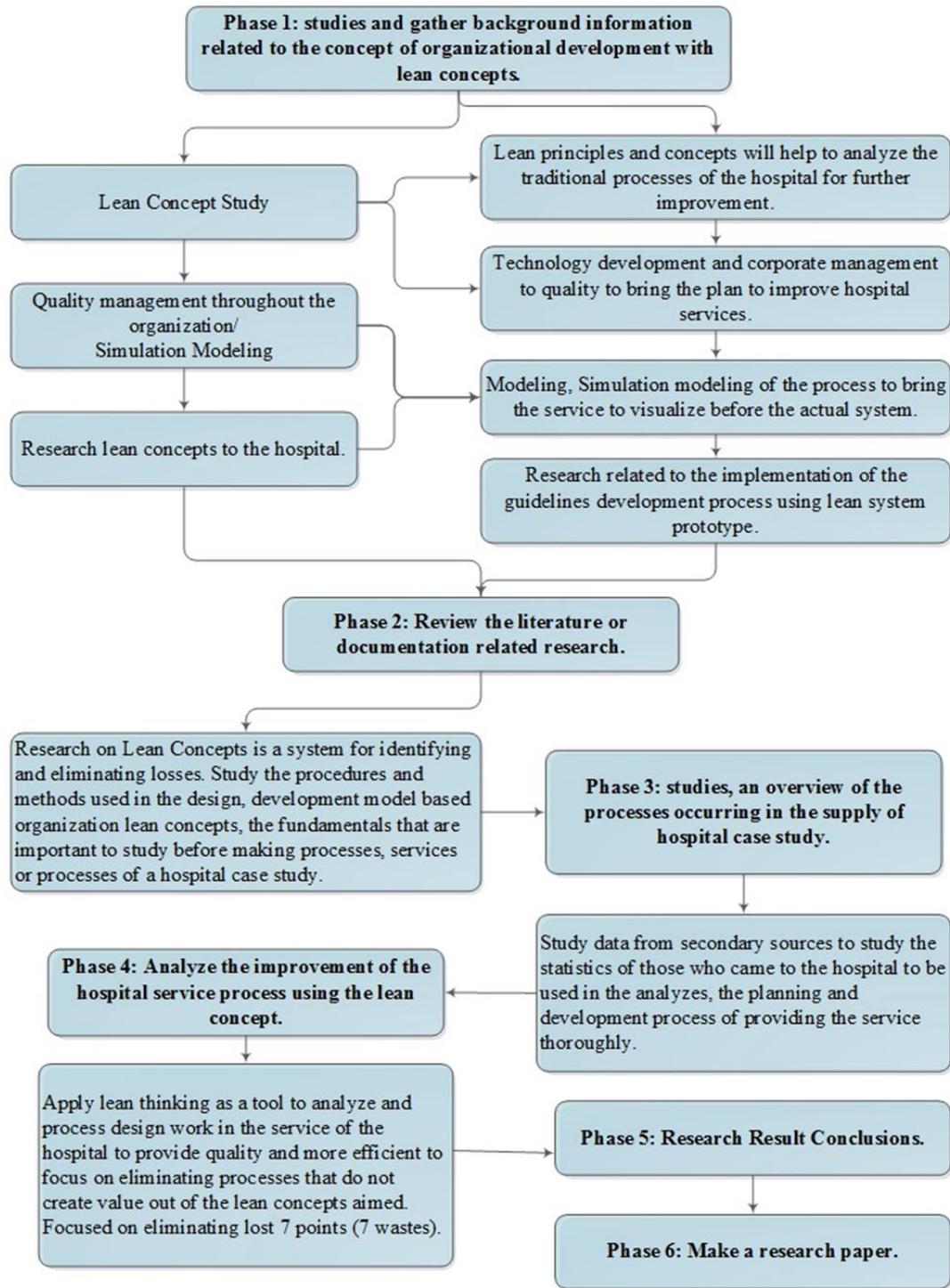


Figure 1.1: Processing Procedure



RUSULTS

The results of the study of service process of Salaya Hospital were presented as followed:

1. The study of the service process of Salaya Hospital
2. The conceptual framework for improving the service process of the new Salaya Hospital

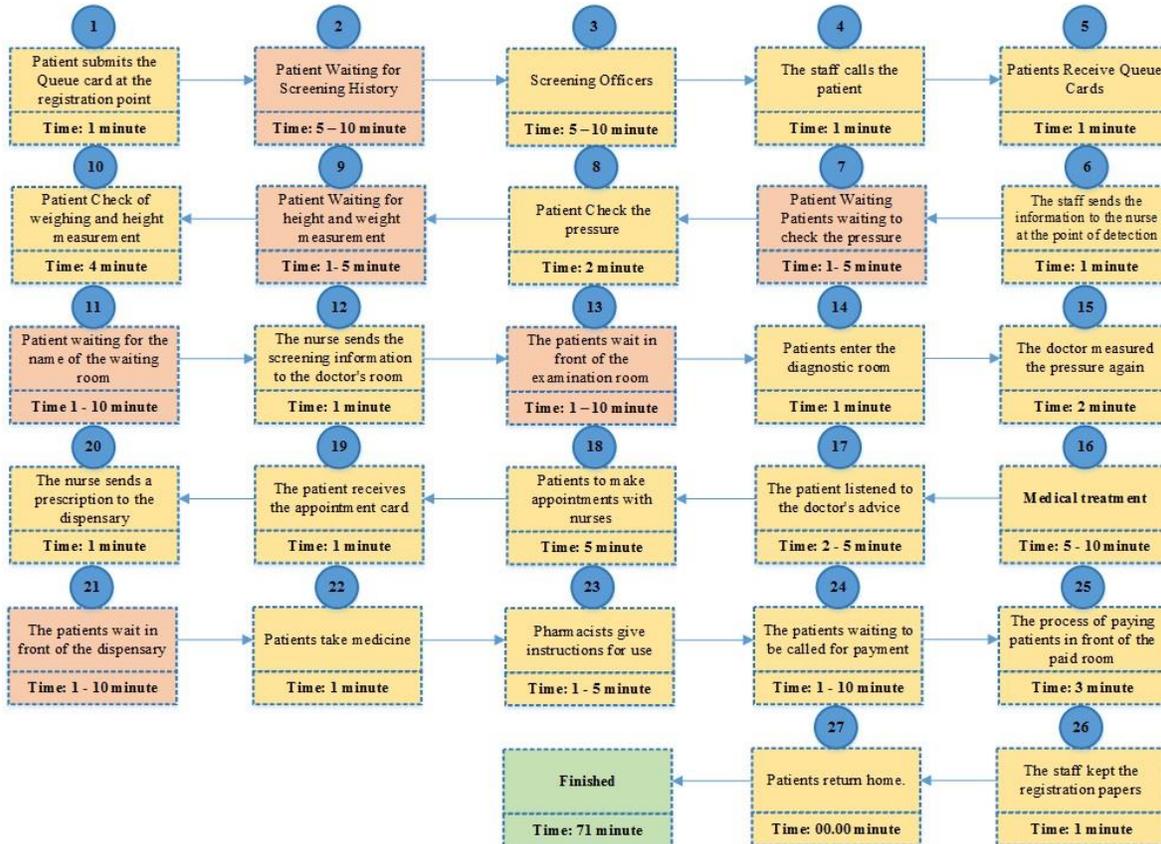


Figure 1.2: Flow Chart of Outpatient Services (OPD) of Salaya Hospital Prior to Lean Implementation

From the diagram of the outpatient services (OPD) process of Salaya Hospital before the improvement of the lean approach. This was a study of the service process of the hospital's service providers to patients who came to the hospital. By the hospital service process, prior processes before implementing the lean approach showed that the average time spent per patient was 71 minutes, and the details were as followed:

Process 1: A patient submitted the queue card or a patient ID card at the registration point when the patient arrived at the hospital for screening records as the card was a necessary document for proceeding next process.

Process 2: The patient waited for screening medical history after the patient has submitted the card at the registration point. Patients waited to be called to get a card to see the doctor.

Process 3: The patient's medical history was screened by officers by giving the officer an ID card. All patients were screened for their medical history for further processing by using computer systems.



Without computer systems, screening patients and searching information may take longer time. This resulted in patients were asked to wait for the documents.

Process 4: The staff called the patient. After screening and retrieving the patient's medical history, the staff provided a card for the patient to proceed in the next step.

Process 5: The patient received a queue card after successful screening.

Process 6: The staff sent a document or the treatment queue card for patients to the nurse at the point of detection. The screening officer sent the patient's medical history sheet to the primary screening point to measure the height and weight scale, as well as the preliminary examination before the diagnosis with the doctor in the next step.

Process 7: The patient waited to check the pressure before seeing the doctor.

Process 8: The patient was checked the pressure before seeing the doctor.

Process 9: The patient was measured the height, and waited for the measurement result before meeting the doctor.

Process 10: The patient was checked the weight, and waited for the result before seeing the doctor.

Process 11: The patient waited for the name of the waiting room. In this process, the data of height, weight as well as pressure were electronically sent to the server, and displayed to the screening medical history. The patient had to sit and wait for the doctor at the examination room.

Process 12: A nurse sent the screening information to the doctor's room, and the nurse would send the patient's primary screening information to the physician for a diagnosis.

Process 13: The patient waited in front of the examination room, and waited to be called the name of the order to see the doctor.

Process 14: The patient entered the diagnostic room to receive the diagnosis to be treated in the next process.

Process 15: The doctor measured the pressure again, and checked the patient's body for the precise diagnosis.

Process 16: The doctor provided medical treatment to treat the symptoms of the disease to the patient according to the doctor.

Process 17: The patient listened to the doctor's advice. After the diagnosis was successful, the doctor would recommend the treatment of the disease to the patient and send the patient to the next process.

Process 18: The patient made an appointment with a nurse after the patient completed the examination to get an appointment card.

Process 19: The patient received the appointment card. When the appointment was completed, the patient had to walk to the waiting room in the dispensary.

Process 20: A nurse sent a prescription to the dispensary. When the appointment was completed, the nurse collected the completed medical records, and followed the procedure. The nurse then sent the documents to the dispensary, and the treatment document and make an appointment to the registration room for the staff to continue recording.

Process 21: The patient waited in front of the dispensary to wait for calling his/her name to receive the drug in the dispensary.

Process 22: The patient received medicine.

Process 23: Pharmacists gave instructions to the patient on medicine instruction.

Process 24: The patient waited to be called for the payment in front of the financial room.

Process 25: The patient waited in front of the paid room.

Process 26: The staff kept the registration papers. Once the process has been completed successfully,



documents and information processed on that day must be logged, and kept in the file by the registration staff. This was the end of the patient’s service process of the hospital.

Process 27: The patient returned home.

From the study of the processes of outpatient services of Salaya Hospital, it was found that all processes in the service consisted of 27 processes. In addition, it was found that each process was delayed by service process analysis. The delay in service was a major problem encountered. By identifying the process, the researcher could see the barriers in the work process causing delays with the redundant workflow. As a result, the researcher and those involved had planned to improve the work process by eliminating latent waste in the patient service process Based on the previous workflow analysis, it is possible to plan improvements in the processes that make the flow of work processes which reduce downtime, and eliminate waste which could decrease the delay. Besides, this will be a guideline for improving the efficiency of the process, as shown in Figure 1.3.

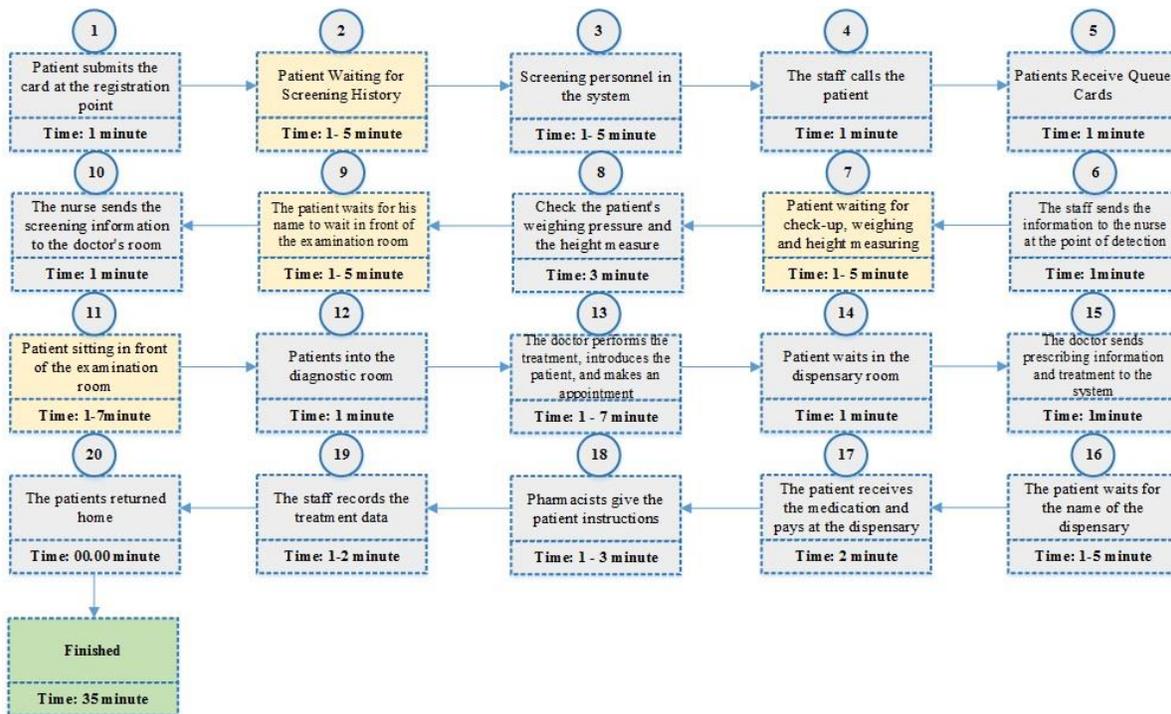


Figure 1.3: Flow Chart of Outpatient Services (OPD) of Salaya Hospital after Lean Implementation

From the chart showing the process of providing the outpatient service (OPD) of Salaya Hospital, which applied the improvement approach using the lean concept by cooperating with the director of the hospital, the nurse and related staffs. From the study of the service process of hospital service providers to the patients who came to the hospital, time spent on services per patient was 71 minutes on average, and the details have been discussed previously. Moreover, the complexity of the service process has been identified. Furthermore, the responsibilities were manipulated based on the concept of lean. In order to effectively manage the work process or service, it is necessary to reduce and integrate the corresponding



activity or process into the same process for smoother and faster operation as well as convenient to patients who came to the service. Additionally, it could also make the service team more patient and faster. With the improvement plan, the new hospital patient service flow chart was created. Consequently, the time spent on services per patient was 35 minutes on average, and the details could be explained as followed:

Process 1: A patient submitted the queue card or a patient ID card at the registration point when the patient arrived at the hospital for screening records as the card was a necessary document for proceeding next process.

Process 2: The patient waited for screening medical history after the patient has submitted the card at the registration point. Patients waited to be called to get a card to see the doctor.

Process 3: The patient was screened by officers by giving the officer an ID card. All patients were screened for their medical history of patient's hospital for further processing by using computer systems. Without computer systems, Screening patients and searching information may take time. This resulted in patients were asked to wait for the documents.

Process 4: The staff called the patient. After screening and retrieving the patient's medical history, the staff provided a card for the patient to proceed in the next step.

Process 5: The patient received a queue card after successful screening.

Process 6: The staff sent a document or the treatment queue card for patients to the nurse at the point of detection. The screening officer sent the patient's medical history sheet to the primary screening point to measure the height and weight scale, as well as the preliminary examination before the diagnosis with the doctor in the next step.

Process 7: The patient waited to check the pressure before seeing the doctor.

Process 8: The patient was checked the pressure before seeing the doctor.

Process 9: The patient was measured the height, and waited for the measurement result before meeting the doctor.

Process 10: The patient was checked the weight, and waited for the weight result before seeing the doctor. Additionally, the nurse would send the patient's primary screening information to the physician for a diagnosis.

Process 11: The patient sat in front of the examination room, and waited for the name to see the doctor.

Process 12: The patient went into the diagnostic room. When patients saw the doctor, the doctor would diagnose and primarily treat the symptoms.

Process 13: The doctor performed the treatment, gave an advice to the patient, and made an appointment for the physician to perform the medical treatment for the patient according to the procedure of the physician. After the diagnosis was complete, the physician would recommend the treatment for the disease and made an appointment with the patient for further examination in the next process.

Process 14: The patient received an appointment card and waited in the dispensary room. When the patient completed receiving the treatment, the patient waited for the drug at the dispensary.

Process 15: The doctor sent prescribing information and treatment to the system.

Process 16: The patient waited for the name at the dispensary.

Process 17: The patient received the medication and paid at the dispensary. In this process, the patient received medication and pharmacist's instructions.

Process 18: Pharmacists gave the patient instructions.

Process 19: The staff recorded the treatment data.



Process 20: The patient returned home.

The study of the patient service process of Salaya Hospital showed that the most prominent problem was that the working process was waiting too long. It was a process that did not bring value; therefore, this study led to lean system utilization. The lean system was intended to reduce the factors that affected the work or flow of the work process. Redundant processes caused too much time to work. On the other hand, the lean system reduced the time that did not add value to the workflow. According to the study of the process providing hospital services in this time, an applied process improvement approach using lean concepts could assist in analysis. The 27-step process took an average of 71 minutes to 20 steps, and an average of 35 minutes if it combined the overlapped process. Service processes 7, 8, 9 and 10 on the measurement of height, weight, and medical history of primary screening was included in the single point. The nurse was solely responsible for separating the original checkpoint. The height of the weighing scale and the initial medical history were 11 minutes, as shown in Figure 1.4.

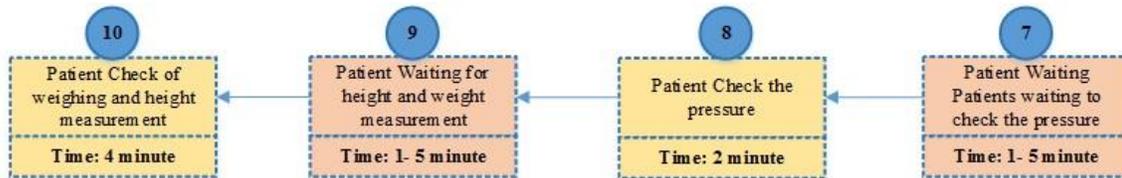


Figure 1.4: The Process of Checking the Original Height Measurement Pressure

After the integration, a consistent workflow could be made in the overlapped process. The process was reduced from 4 processes to 2 processes, reducing the waiting process and reducing the working time in the process to 11 minutes. The average working time was 5.5 minutes, as shown in Figure 1.5. The conventional procedure was repeatedly measured by a physician before treatment, which took about 2 minutes. The redundant work caused no value has been cut out to make this process work time reduced to 2 minutes as shown in Figure 1.6.

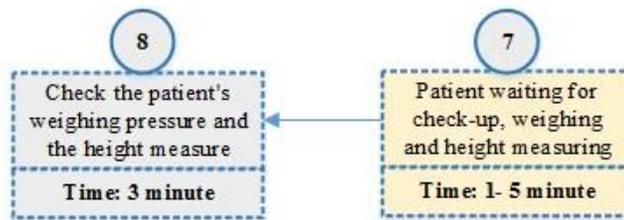


Figure 1.5: A New Height Measurement Process

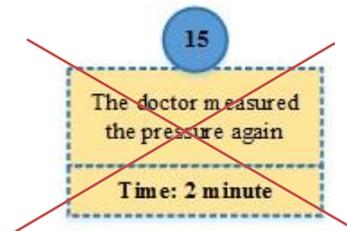


Figure 1.6: Duplication of Processes of Medical Pressure Measurement



After that, the work process was further analyzed. In the process, after the treatment, the patient must make an appointment to see the doctor next time. The original procedure allowed the patient to make appointments with the nurse. The patient must be moved to another location for the next appointments and must wait for the appointment before going to the dispensary. At this point, the traditional service process took an average of 14.5 minutes, as shown in Figure 1.7.

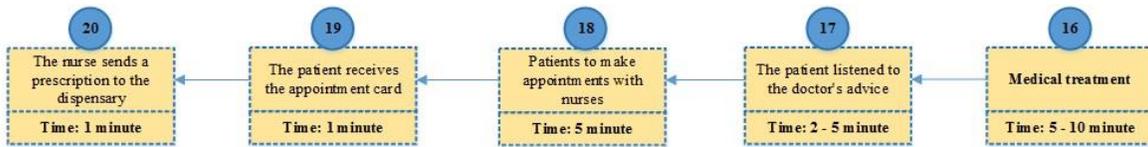


Figure 1.7: Medical Screening Process and Original Appointment Card

In order to improve the service process, doctors have been able to make appointments to patients for the accuracy of the next treatment. The process of reconciliation with the patient is optimized, and the process of reconciling the processes was reduced to five (16 17 18 19). 20) The remaining processes were three (13, 14 and 15), and it could reduce the time from 14.5 minutes to 5.5 minutes, the average time was shown in Figure 1.8.

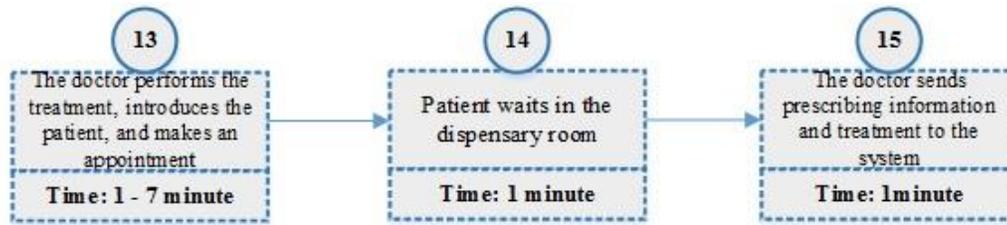


Figure 1.8: Medical Screening Process and New Appointment Card

The final process was a process where, after the diagnosis and appointment, the patient had to take the medication and paid for the treatment. The patient must wait for the medication to be ready to go to the waiting room to pay at the financial room. It was found that the process of service between the two processes was characterized by a waiting time of 2 (21 and 24) and a considerable waiting time with an average time of 10 minutes. The overall duration of the two processes was 16.5 minutes, as shown in Figure 1.9.



Figure 1.9: Traditional Medicine and Payment Processes

Researchers and those who perceived drug paraphernalia are knowledgeable enough to handle drug counseling. The patients could also pay for medicines and medical treatment. This could reduce the process of payment and waiting. The patients could receive medicine and paid for this process. The process was improved



to the same process. It could reduce the processing time from 5 processes (16 21 22 23 24 and 25) to 3 processes (16 17 and 18), and reduce the time from 16.5 minutes. The average was 5 minutes as shown in Figure 1.10.

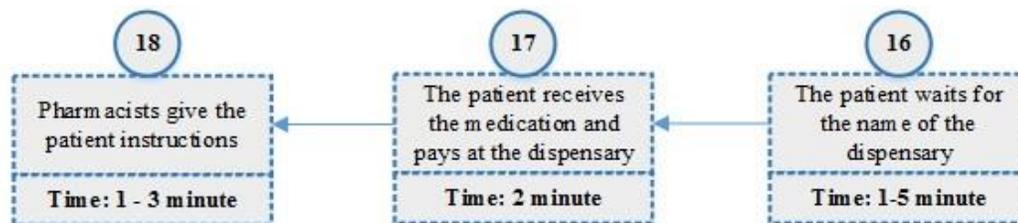


Figure 1.10: New Drug Delivery and Payment Process

A total of 27 steps took an average of 71 minutes, leaving only 20 steps, with an average time of 35 minutes. It helped in process analysis in reducing losses and processes to make the process more efficient. As a means of improving the process, the downtime was as high as 36 percent, or 49.30 percent of the reduction in the duration of the work resulting in significant improvements by reducing duplication of work, and the process is consistent. In addition, the process causes more time to be wasted. The technology is used to help to manage the documents and information of patients and to share information to each department for the speed of data transmission by reducing the process of documenting, and decreasing the cost of office paper. The director of Salaya Hospital has recognized the importance of applying the technology to work very much which the current work is already applied an information system but not fully used.

This new workflow is just a kind of process improvement plan. If it works according to the planned guidelines, it can follow the same direction. Focusing on the service process is important, and promoting the service process by providing plan can frame the service process and can clearly and continuously provide the service as well as can solve the problem, reduce the time, and work process redundancy. As a result, patients are able to follow the procedure correctly. Hospitals can provide faster and more patient services to the patients by reducing the process or managing new service processes. The quality of the treatment remains the same; furthermore, it saves time to the patient as well as continuously gains reliability.

CONCLUSION AND DISCUSSION

Research in improving service processes with lean concepts; a case study of Salaya Hospital that aimed to study the service process of Salaya Hospital for Outpatient Services (OPD based on applying concept of lean into improving the hospital's service process as framework which the guidelines was discussed by interviewing one hospital director, two physicians, five nurses, and three staff members on hospital service information and the concept of process improvement Showed that the service processes provided to patients were reduced. The staffs can work more efficiently. However, this study is just a model to improve the service process with the lean concept provided to traditional services, and redesign a new service process. The hospital director sees the difference between traditional and new services, and it can be a model to improve the service of Salaya Hospital in the future. The result of the service process of



Salaya Hospital can be categorized into two sections including:

1. The study of the service process of Salaya Hospital.
2. The conceptual framework for improving the service process of the new Salaya Hospital.

From the study of the process of outpatient services of Salaya Hospital, it was found that all processes in the service were 27 processes and found that each process was delayed due to the service process analysis. The delay in service was a major problem encountered. According to identifying the process, the researcher could see the barriers in the work process which caused delays with the redundant workflow. As a result, the researcher and those involved have planned to improve the work process by eliminating latent waste in the patient service process. Regarding to the previous workflow analysis, it is possible to plan the improvements in the processes that makes the flow of work processes consistent, reduces downtime, and eliminates waste. In other words, it is a way to improve the work process to be more effective.

In addition, it is a process that does not add any value as this study uses lean systems to help improve lean processes based on the aim of reducing the factors that affect the work or flow of work processes, as well as duplicating processes which cause time-consuming. Lean systems focus on reducing the time while does not add value to the workflow. According to the study of the process providing hospital services in this time, an applied process improvement approach using lean concepts can assist the analysis. There are 27 processes that take an average of 71 minutes to 20 steps, and an average of 35 minutes compared to the same process. It helps process analysis in reducing losses and processes to make the process more efficient. As a means of improving the process, the downtime is as high as 36 percent, or 49.30 percent of the reduction in the duration of the work resulting in significant improvements by reducing duplication of work, and the process is consistent. In addition, the process causes more time to be wasted. The technology is used to help manage the documents and information of patients, and to share information to each department for the speed of data transmission by reducing the process of documenting as well as decreasing cost of office paper. The director of Salaya Hospital recognizes the importance of applying the technology to work very much work which the current work is already an information system, but not fully used.

This new workflow is just a model of process improvement planning. If it works according to the guidelines laid out, it can follow the same direction. Focusing on the service process is important, and promoting by providing plan can frame the service process and can clearly and continuously provide the service as well as to solve the problem, reduce the time and rerun the process. As a result, patients are able to follow the procedure correctly. Hospitals can provide faster patient services, and service more patients by reducing the process or managing new service processes. The quality of the treatment remains the same in term of saved, reliable and continuous to the patients.

SUGGESTIONS

From research “Improvement of the Service Process Based on Lean Concept: A Case Study of Salaya Hospital” The suggestions are presented as followed:

1. In this study, the limitation is on the duration of the severity of the symptoms of patients. There are no definite timelines for the treatment of individual patients. Therefore, after considering the overall picture of the service, the time of service should be more concerned due to the average time to run the process according to the framework of the study. If the future research would like to study lean systems in



health services, the time should be minimized as much as possible. Consequently, the length of service provided by the patient's medical history of treatment should be more investigated.

2. For other agencies or hospitals that adopt lean systems, improving work processes or dividing the service should be conducted. Furthermore, patients should be periodically evaluated in order to bring the evaluation results to continuously improve the service process, and efficiently run the process as the lean concept is used to solve the problem.

3. The importance of lean systems is that it can improve the process in any kinds of department. The lean concept can be applied into training for all staff, making individuals involved in the work process to understand the system of lean as well as work in the same direction, providing opportunity for everyone to plan and decide on a solution. This will result in organizations having a good-quality and efficient work process in an organization.

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8th November 2018, Suan Sunandha Rajabhat University, Bangkok, Thailand



The Improvement of the Service Process Using Lean Concept: A Case Study of Ranong Hospital

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ABSTRACT

This research is the first phase of research to improve the process of service with lean conceptual. This research is a case study of Ranong Hospital. The purposes of this study were to investigate the service process of Ranong Hospital, and to investigate the frame concept of improving the service process of Ranong Hospital to be more effective. The Lean concept was used to help in analysis of the work process. It also provided a framework for improving the development of new services. Data were collected by interviewing five nurses and three staff members. The data were analyzed by using descriptive statistics. The results of the research showed that the new work process has been developed depending on the relevant stakeholders. There were 22 processes of the original version of service process that took an average of 74.5 minutes, and 18 processes of the new version of service process that took an average of 45 minutes. Explicitly, it helped in process analysis to reduce losses and reduce processes to make the process more efficient. In terms of process improvement, the downtime was as high as 29.5 minutes, or 39.59 percent of the reduction in work time. As a result of improvements, it reduced redundant processes, reduced waiting times, and it was reduce number of the workers by integrating a consistent workflow into the same process. The process didn't produce value, it cuts out. It could handle the problem of waste service. The results of the hospital service improvement study show the needs and have the basics to managed quality. The results of this study show the tight, the effectiveness, and suitability for the context of the organization.

Keywords: *Hospital, Quality Improvement, Process of Service, Lean Concept*

INTRODUCTION

The hospital is considered an organization that provides services. It is a professional organization (Professional bureaucracy). It is the introduction of professional knowledge as a base for lean organization development integrating the different types of organizations into the goal of developing quality services to be safe, fast delivery, and low operating costs with moral ethics values in the view of the service recipient. Additionally, it reviews existing standards, and develops sustainable services. The goal remains the same and will be better than ever.

Competition plays an important role on the improvement of quality and patient satisfaction in healthcare institutions. In the environments where there is no competition, the demand surpasses the supply. Hospitals offer their patients unsatisfactory services because of the idea that the patients have no other alternatives, and they would unconditionally accept the present services. In the healthcare industry, hospitals provide the same types of service, but they are different based on the quality of service (Chaniotakis & Lymperopoulos, 2009).

Healthcare costs are continuously increasing. The hospitals to provide quality care without passing on the cost burden to the patients have become a steep challenge (Zheng et al., 2008; Dobrzykowski, 2012). Under such circumstances, the pivot of attention has gradually shifted towards containment of cost through the management



of supply networks and the network relationships. Thus, supply chain interactions, relationships, value creation activities and collaborative environment along the chain with the network actors have increased in importance for health care providers (Pralhad & Ramaswamy, 2004; Nollet & Beaulieu, 2003; Lonsdale & Watson, 2005).

Hospital service is one of the most important tasks of the hospital. It involves with providing prompt and accurate services, such as patient care services, patient referral services, of patients relative services. Moreover, these should be manipulated by cooperating with health promotion, disease prevention, sanitary and environmental health services, diagnostic services, pharmaceutical services, nutrition services, patient rehabilitation services, dental services, research services, education and training services as well as other hospital services.

Ranong Hospital focuses on hospital quality in improving service quality and community involvement. According to the strategic issues in service system development as well as quality management throughout the organization, there may be a positive effect if the lean management and development concepts to improve quality are applied in to the hospital service systems, especially in Ranong Hospital, in order to have efficient work processes. In addition, it can simultaneously promote utilizing existing resources to create value for customers as well as adding value and reduce waste while the concept and goal of the hospital are still remained. Furthermore, for the continuous development of lean, it can reduce administrative costs and eliminate unnecessary duties which entail the flow processes. For the benefit of the patients, the lean concept is a continuous process management tool. It is a tool that will empower organizations by considering the response ability to the needs of customers or patients in the hospital, or creating value in the service. This is due to the fact that the concept can eliminate wasted processes throughout the entire process, and lead to a reduction in service costs as well as good results for the hospital. At the same time, besides applying the lean concept in improving the service process, this research focuses on delivering quality service depending on the study proposed by Ubonwan Ontoa (2008).

The application of lean manufacturing in tire manufacturing industry has been studied. The objective was to guide the application of lean manufacturing in the tire industry by charting the current value. In order to identify the value of the process, current production system modeling had to be combined and studied to use as information in analyzing alternatives, evaluating and developing a future value stream chart. With these references, the research employed simulation evaluation using lean tools and techniques.. Lean production systems were applied in three techniques including one-piece flow or continuous flow, all-round maintenance and reduced setup time. As a result of simulation in eliminating waste, it could reduce the total production time from 16.20 days to 12.73 days in average or 21.42 percent, and the simulation results was proceed to create a value chart.

RESEARCH OBJECTIVES

1. To study the service process of Ranong Hospital
2. To develop a framework to improve the services of the hospital in Ranong

RESEARCH METHODOLOGY

This research is designed to provide a framework in improving the hospital services process by applying the concept of lean to the hospital. The research process consisted of three parts including:

Part 1: Studying and collecting basic information related to the applying the lean concept into concept of organizational development

Part 2: Implementing and analyzing the lean concepts used to improve hospitalization processes



Part 3: Summarizing and guiding the implementation.

The mentioned processes could be illustrated as in the Figure 1.

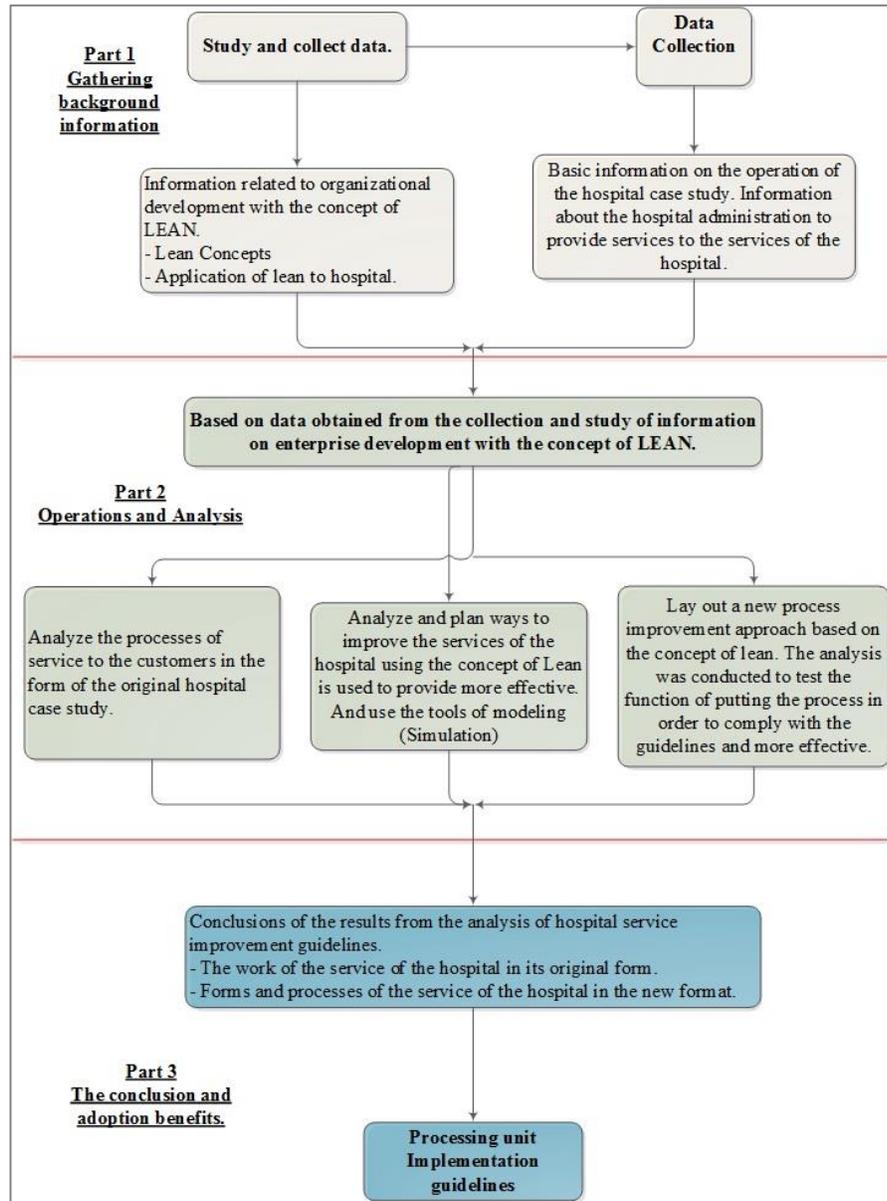


Figure 1. Research Frameworks

RUSULTS

This study investigated the improvement of the service process using the lean concept in a case study of Ranong Hospital. An outpatient service (OPD) study was conducted by employing five interviews with nurses. Three staffs were gathered information on hospital service procedures and inquired about how to improve service procedures, and to provide faster treatment and services to patients. This study was a



simulation of the model in improving the hospital service process using the lean concept to help analyze the work process. The service was studied to design a new way of services. The hospital director noticed the difference between traditional and new services, and claimed that it can be a model to improve the service of Ranong Hospital in the future. The results of the study of service procedures of Ranong Hospital could be summarized into two main aspects as followed:

1. The study of service procedures of Ranong Hospital
2. The conceptual framework for improving the service procedures of new Ranong hospital

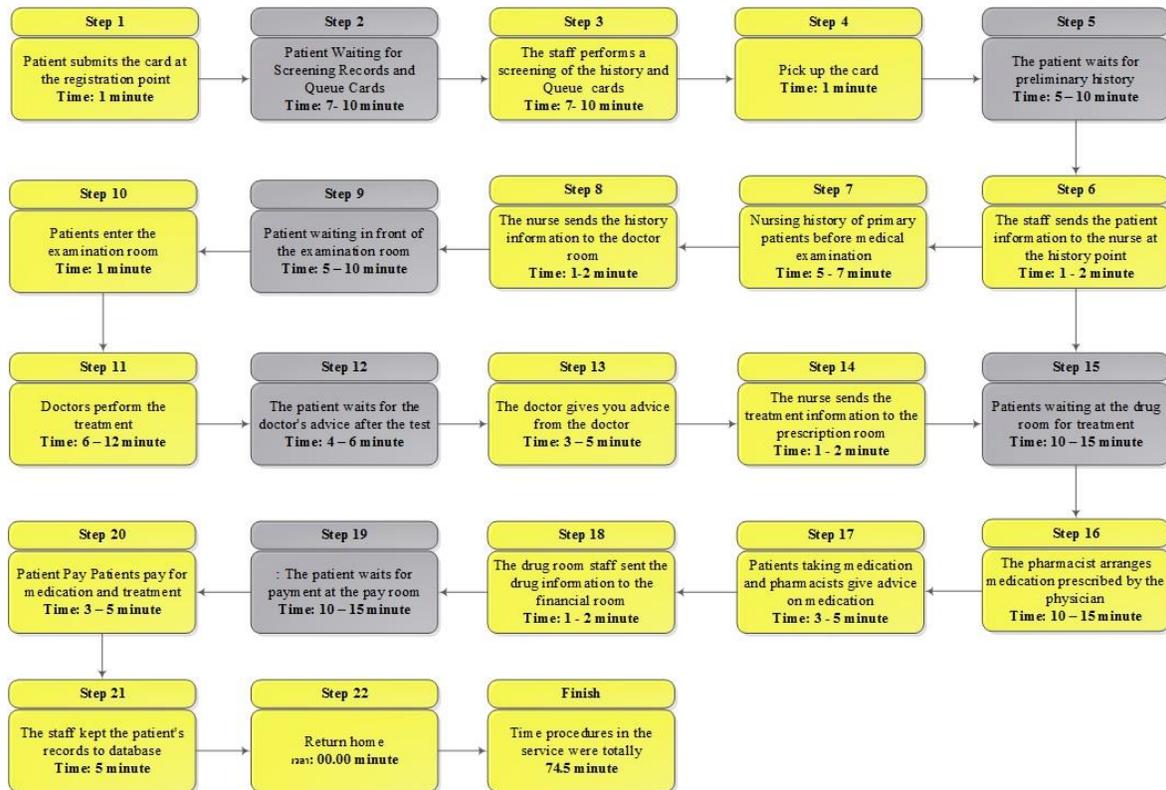


Figure 2. Outpatient Procedure Flow Chart (OPD) of Ranong Hospital Prior to Lean Implementation
Source: From researcher's data by interviewing related persons in Ranong Hospital.

From figure 2, the chart showed the outpatient services (OPD) of Ranong Hospital before implementing the lean approach. It illustrated the service process of the hospital's service provided to patients who come to the hospital. As a result of this original process, the time spent on services per patient was 74.5 minutes on average, and the details were explained as followed:

Step 1: A patient submitted the ID card or a patient ID card at the registration point when the patient arrived at the hospital to screen the medical history, and was given a queue card to enter the treatment.

Step 2: The patient waited for screening records and received a queue card to see the doctor after the patient has submitted the card at the registration point.

Step 3: A staff performed screening the storage system of the patient's medical history and prepare



a queue card for the officer who received the ID card. The storage system included a paper-based document format and computer systems. Without computer systems, screening patients and searching information may take longer time. This resulted in patients were asked to wait for the documents.

Step 4: The officer picked up the card. After screening and retrieving the patient's medical history, the staff would call the patient to receive a queue card to proceed in the next step.

Step 5: The patient waited for preliminary medical history.

Step 6: The staff sent the patient's information to the nurse at the medical history point. After the card has been received by the patient, the screening officer sent the patient's medical history sheet to the primary medical history point to measure the height and weighing scale, as well as the preliminary examination before the diagnosis with the doctor in the next step.

Step 7: A nurse considered the primary medical history of patient before medical examination. The nurse measure patient's height and weight to initially evaluate symptoms before a doctor perform diagnosis in the next step.

Step 8: The nurse sent the medical history information to the doctor room. After the nurse has considered medical history, checked the patient's pressure, weight and height, he/she sent the patient's primary screening information to the doctor's office for further screening.

Step 9: The patient waited in front of the examination room. After the patient has checked the pressure, weight and height with the nurse, the patient had to sit and wait for the doctor at the examination room.

Step 10: The patients entered the examination room, and went to the doctor to be diagnosed and treated.

Step 11: The doctors treated the symptoms of the disease to the patient according to the procedure of the doctor.

Step 12: The patient waited for the doctor's advice after the diagnosis. After the diagnosis was completed, the doctor would recommend the treatment of the disease to patients and sent patients to the next process.

Step 13: The doctor advised on the treatment of the disease to the patient.

Step 14: The nurse sent the treatment information to the prescription room. The nurse would collect the completed medical records and follow the next steps. He/she then delivered documents to the dispensary, and make an appointment for the patient in the registration room.

Step 15: The patients waited at the drug room for medicine. The patient had to wait for being called to receive the drug in the dispensary.

Step 16: The pharmacist arranged medication prescribed by the physician. After the nurse received the prescription drug from the patient, the pharmacist arranged the medication for patients prescribed by the doctor.

Step 17: The patients took medication, and the pharmacist gave advice on medication.

Step 18: The drug room staff sent the drug information to the financial room.

Step 19: The patient waited for payment at the pay room.

Step 20: The patients paid for medication and treatment.

Step 21: The staff kept the patient's records to database when all the steps have been completed. Documents and information processed on that day must be logged, and kept in the file by the registration staff. This was the end of the patient's service process of the hospital.

Step 22: The patient returned home.

From the study of the outpatient services of Ranong Hospital, it was found that all procedures in the



service were totally 22 steps. All services to only one patient were 74.5 minutes, and each service was delayed according to the service analysis. Delay in service is a major problem encountered. With the classification of procedures, it was noticed that the various obstacles in the work process that cause delays involved with the redundant workflow. As a result, the researcher and those involved have planned to improve the workflow by eliminating latent waste in the patient service process based on the previous workflow analysis. The planning process which has been improved to streamline workflows by considering the correspondence of reducing downtime, eliminating barriers and eliminating wastes could decrease the delays, and the results were demonstrated as in Figure 3.

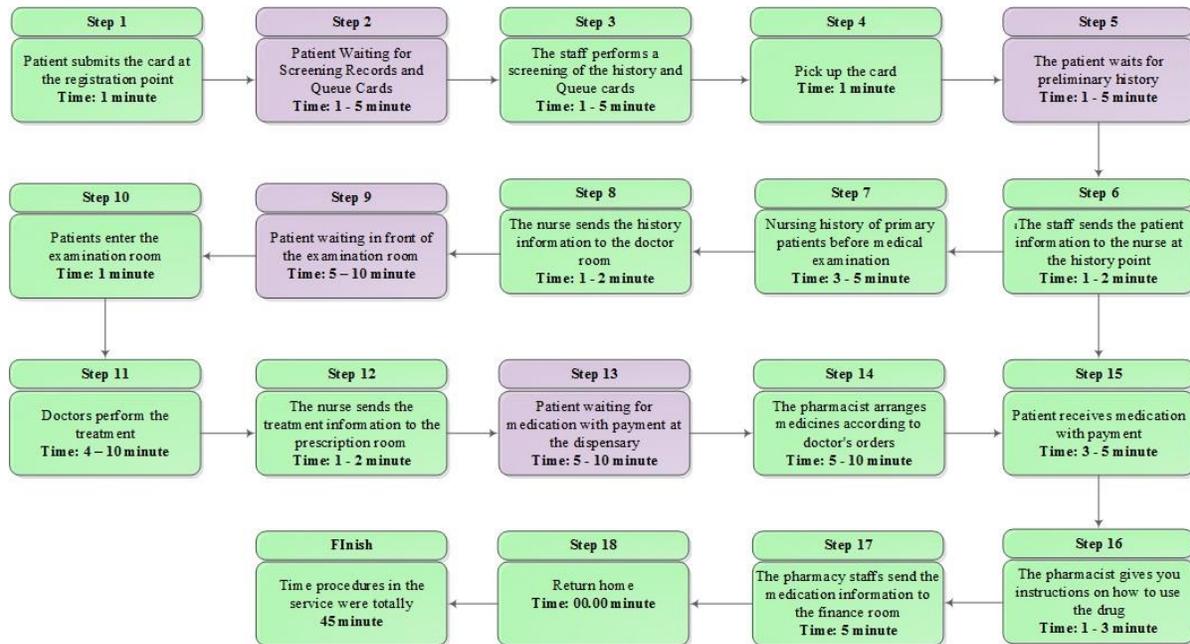


Figure 3. Flow Chart of Outpatient Services (OPD) of Ranong Hospital after a Lean Approach
Source: From the researcher's data by interview and conceptual sharing with those involved in Ranong Hospital.

From the flow chart of the Ranong Hospital Outpatient Services (OPD) which applied a lean approach based on the director of the hospital, the nurse and related staff. The study of hospital service perceptions of service providers in the hospital showed that the time spent on services per patient was 74.5 minutes on average, and the details have been discussed previously. Moreover, the complexity of the service process has been identified. Furthermore, the responsibilities were manipulated based on the concept of lean. In order to effectively manage the work process or service, it is necessary to reduce and integrate the corresponding activity or process into the same process for smoother and faster operation as well as convenient to patients who came to the service. From the development of the model, a new hospital patient care flow chart was developed. The service time per patient on average of 45 minutes, and there were eighteen work steps as followed:

Step 1: A patient submits the ID card or patient ID card at the registration point to screen the



medical history when the patient arrives at the hospital.

Step 2: The Patient waits for screening records and a queue card to see the doctor after the patient has submitted the card at the registration point.

Step 3: A staff performs screening the storage system of the patient’s medical history and prepares a queue card for the officer who received the ID card. The storage system includes a paper-based document format and computer systems. Without computer systems, screening patients and searching information may take longer time which patients are consequently asked to wait for the documents.

Step 4: The officer picks up the card. After screening and retrieving the patient's medical history, the staff will call the patient to receive a queue card to proceed in the next step.

Step 5: The patient waits for preliminary medical history.

Step 6: The staff sends the patient information to the nurse at the medical history point. After the card has been received by the patient, the screening officer will send the patient's medical history sheet to the primary medical history point to measure the height and weighing scale, as well as the preliminary examination before the diagnosis with the doctor in the next step.

Step 7: A nurse considers the primary medical history of patient before medical examination. The nurse measures patient’s height and weight to initially evaluate symptoms before a doctor perform diagnosis in the next step.

Step 8: The nurse sends the medical history information to the doctor room. After the nurse has considered medical history, checked the patient’s pressure, weight and height, he/she sends the patient's primary screening information to the doctor's office for further screening.

Step 9: The patient waits in front of the examination room. After the patient has checked the pressure, weight and height with the nurse, the patient has to sit and wait for the doctor at the examination room.

Step 10: The patient enters the examination room to see a doctor to be diagnosed the patient’s symptoms.

Step 11: The doctor treats the symptoms of the disease to the patient according to the procedure of the doctor. After the examination, the doctor gives an advice of the treatment, and sends the patient to the next process.

Step 12: The nurse sends the treatment information to the prescription room. The nurse will collect the completed medical records and follow the next steps. He/she then delivers documents to the dispensary, and makes an appointment for the patient in the registration room.

Step 13: The patient waits for medication and its payment at the dispensary. The patient has to wait for being called to receive the drug in the dispensary, and pays the payment at the dispensary to reduce the time of the payment process.

Step 14: The pharmacist arranges medicines according to doctor's orders after the nurse receives the prescription drug from the patient

Step 15: The patient receives medication, and pays for the medication.

Step 16: The pharmacist gives the patient instructions on how to take the medicine.

Step 17: The pharmacy staff sends the medication information to the finance room. The staff collects the patient’s treatment information. After all the steps have been completed, all documents and information processed on that day must be logged, and keep the documents in the file by the registration department. This is the final process of hospital's patient service.

Step 18: The patient returns home.

From the study of patient service procedures at Ranong Hospital, the most prominent problem was



that there were many processes to conduct as well as each process was time-consuming. It was also a process that did not bring value; therefore, this study used lean concepts to analyze lean workflows, which were aimed at reducing the factors that affect the workflow. Redundant steps made it too time consuming; however, the lean system could reduce the time that did not add value to the workflow. The study of hospital service procedures in this case attempted to set up a lean approach to the workflow using lean concepts. Consequently, The 22 steps of process, which took an average of 74.5 minutes, were re-manipulated into 18 steps which took an average of 45 minutes as it combined the overlapped processes, and reduced the work process that did not bring value. The researcher has improved the process plan and controlled the time to work in each step properly. The step 1, 3, 4, and 5 services on the registration and queue card as well as screening medical history of patients before seeing the doctor was reduced their downtime to ensure tightening operation, and it was noticeably faster than the previous service. The steps 1, 2, 3, 4 and 5 spent the operating time on the average of 17 minutes, as shown in Figure 4.

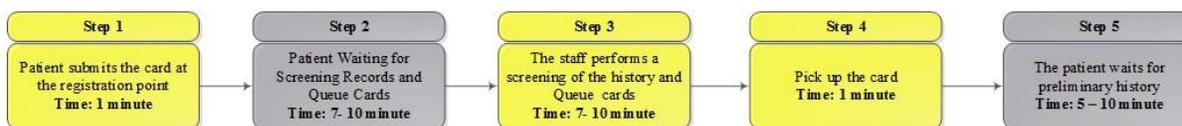


Figure 4. The Operating Time of Original Service Step 1, 2, 3, 4 and 5

After analyzing the use of lean concepts in planning improvement work processes to reduce the waiting time, and appropriately re-manage each process, the timing of the operation of each step could be improved as shown in Figure 5.

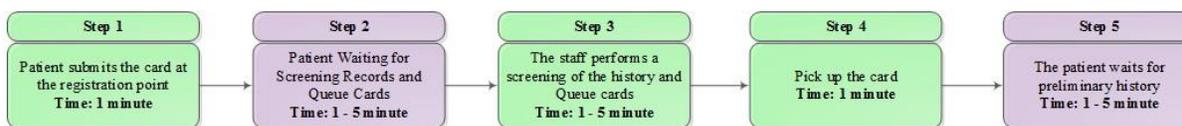


Figure 5. The New Operating Time of the Service Steps 1, 2, 3, 4 and 5

According to the picture, the waiting time of step 1, 2, 3, 4, and 5 were reduced from 17 minutes to 9.5 minutes on average. It could reduce the working time in the first 5 steps of a total of 7.5 minutes. In addition, it has improved the working process in the work process at 6 7 8 9 and 10 from the previous service stage at 6 7 8 9 and 10. All operating time the average time was 11.5 minutes, as shown in Figure 6. The new working time which was reduced slightly to allow the process to be shortened to 1 minute was shown in Figure 7.

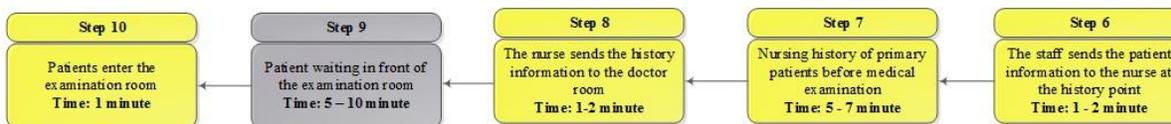


Figure 6. The Original Version of the Service Step 6, 7, 8, 9 and 10.

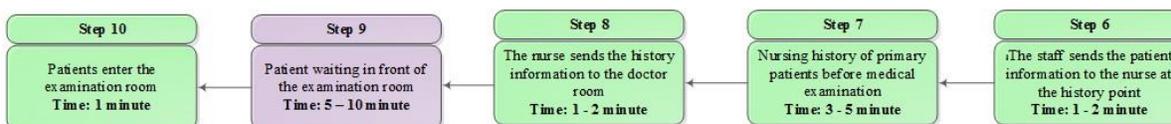




Figure 7. The New Version Time of the Service Step 6, 7, 8, 9 and 10

After the analysis of the work process in the process of medical treatment, the process was divided into doctor treatment and doctor advice as well as dispensaries. However, the patient had to wait for medical advice. The researcher saw that the original version of service process (i.e., step 11 12 13 14 and 15) at this stage was non-value as took an average of 20 minutes as shown in Figure 8

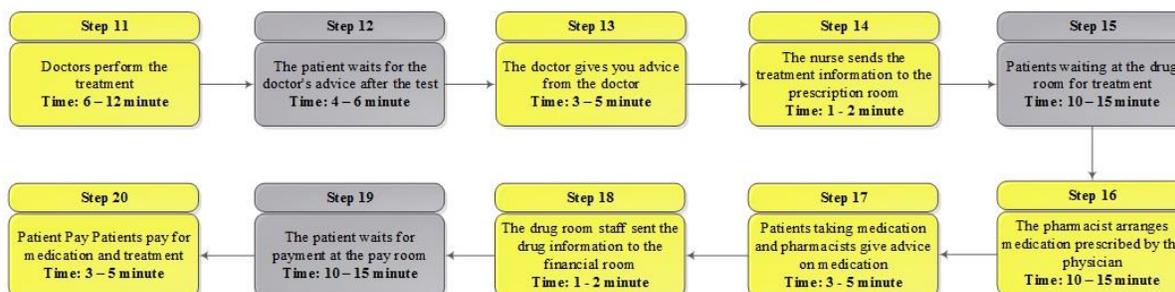


Figure 8 Examination and Counseling Procedures for Patients and Dispensaries.

The procedures of examining and advising patients of traditional medicine in step 12 and 13 were combined into step 11, and the operating time was concisely improved which could reduce the rate of patient fall meanwhile help doctors treat patients faster which was good for the operation of the hospital. Moreover, when the medication was completed, the nurse could deliver the patient information and treatment information to the next step immediately. The procedure of examination and counseling of patients and new dispensaries had the time to complete the patient in receiving services within only 18.5 minutes which means that the patient saved time to receive the medication and pay the payment as shown in Figure 9.

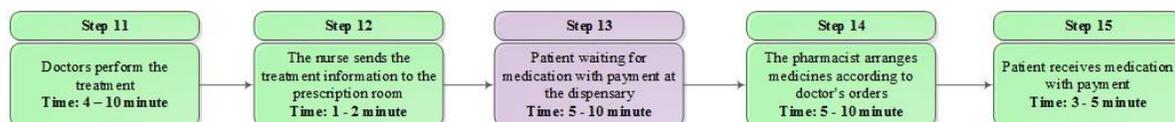


Figure 9. New Version of Examination and Counseling Procedures for Patients and Dispensaries

In the post-treatment phase, the medication and payment process mentioned above was due to the fact that the researcher has manipulated procedures for the examination and counseling of patients and the dispensing of medications. In short, the working process was reduced which resulted in faster service. In addition, during the onset of drug delivery in the original version, the patient had to receive the medications well as pay the payment at the financial room which took 21 minutes. On the other hand, in the new version, the processes of receiving medication and paying the payment could be conducted at the same time. The hospital would provide the pharmacist the financial assistance or additional staffs to response this task by mainly considering the suitability of the hospital. Additionally, if this process is combined, it can make the hospital reduce the duration of work and of waiting. As seen, the waiting time per patient in step 19 was decreased as evidenced by the average of time was only 10-15 minutes as shown in Figure 10.

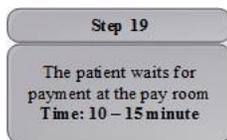


Figure 10. Traditional Patient Pending Payment Procedures

After the medication was received and the pharmacists would advise the patient on medication use instruction before the patients returned home. The total of operating time of 22 services had an average of 74.5 minutes as shown in Figure 11. In contrast, the new version of service process consisted of 18 steps which an average of operating time was 45 minutes as shown in Figure 12.

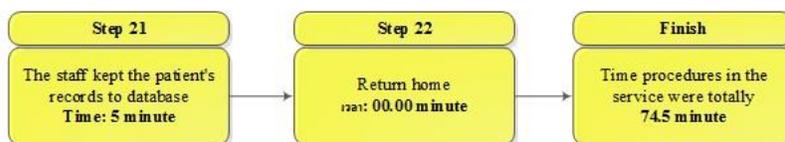


Figure 11. Original Version of Final Service Procedure for Ranong Hospital

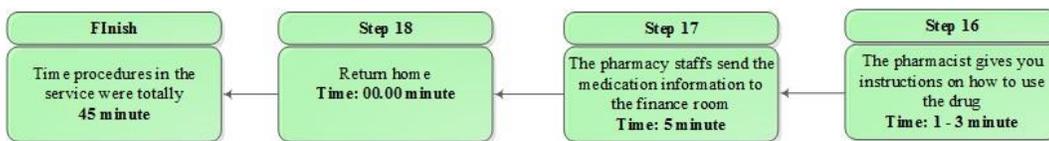


Figure 13. New Version of Final Service Procedure for Ranong Hospital

The improvement of all steps mentioned above showed that there were 22 steps in the traditional-version process having an average of the operating time of 74.5 minutes, whereas there were only 18 steps of the improved process with an average of the operating time of 45 minutes. It could be claimed from the analysis that it could reduce time consuming, and decrease the steps to make the workflow more efficient. In terms of improvement, the duration was reduced to 29.5 minutes or 39.59 percent as a result of improvements by reducing duplication of work, shortening the duration of service, decreasing the waiting process of the patient as well as having a consistent workflow.

This new workflow is just a way of planning improvements. If it works according to the planned guidelines, it can follow the same direction. Focusing on the service process is important, and promoting the service process by providing plan can frame the service process and can clearly and continuously provide the service as well as can solve the problem, reduce the time, and work process redundancy. As a result, patients are able to follow the procedure correctly. Hospitals can provide faster and more patient services to the patients by reducing the process or managing new service processes. The quality of the treatment remains the same; furthermore, it saves time to the patient as well as continuously gains reliability.

CONCLUSION AND DISCUSSION

The study of the process of outpatient services of Ranong Hospital found that all processes in the service were totally 22 processes, and each process was delayed according to the service process analysis. In other words, the delay in service is a major problem encountered. By identifying the process, the



researcher can see the barriers in the work process on the cause of delays to consume longer than necessary as a result of the redundant workflow, and the process does not add any value. Consequently, the researcher and those involved have planned to improve the work process by eliminating latent waste in the patient service process based on the previous workflow analysis as well as reducing downtime which entail the delay. It is a way to improve the work process to be more effective.

This study uses lean systems to help improve lean processes by reducing the factors that affect the workflow, such as manipulating the overlapped processes as well as reducing time that does not add value. According to the study of the process in providing hospital services in this time, the process improvement approach using lean concepts to assist in analysis can reduce the traditional process having a total of 22 processes, and spend an average of operating time of 74.5 minutes into 18 steps with an average of operating time of 45 minutes. It helps in process analysis to reduce losses and reduce processes to make the process more efficient. In terms of process improvement, the downtime was as high as 29.5 minutes, or 39.59 percent of the working time spent. However, the new workflow is just a model of process improvement planning. If it works according to the guidelines laid out, it can follow the same direction. Focusing on the service process is important, and promoting by providing plan can frame the service process and can clearly and continuously provide the service as well as to solve the problem, reduce the time and rerun the process. As a result, patients are able to follow the procedure correctly. Hospitals can provide faster patient services, and service more patients by reducing the process or managing new service processes. The quality of the treatment remains the same in term of saved, reliable and continuous to the patients

SUGGESTIONS

From research “The Improvement the Process of Service Using Lean Concept: A Case Study of Ranong Hospital”, there are four suggestions as following:

1. In this study, it was found that the limitation of the duration of the patient's visit was dependent on the individual patient and the severity of the illness. There are no definite timelines for the treatment of individual patients. In this study, the overall picture of all services is considered, and the time of service on an average basis is calculated so that the workflow is within the framework of the study. The future research which would like to focus on the lean systems for health services in effectively reducing their service timelines should study on the length of service provided by the patient's medical history of treatment.
2. For other agencies or hospitals that adopt lean systems, improving work processes or dividing the service should be conducted. Furthermore, patients should be periodically evaluated in order to bring the evaluation results to continuously improve the service process, and efficiently run the process as the lean concept is used to solve the problem.
3. The importance of implementing lean systems to improve processes, regardless of the workplace, should encourage and train all staffs to have understanding on a lean of the system in order to work in the same direction, and allow everyone to participate in planning and decision-making. The management will result in having a quality work process and more efficiency of organizations.
4. With the information technology system, it can be used to manage the documents and information of patients, and also faster transfer information to each department. In addition, it can reduce the process of document management and search, as well as decrease the time and cost of office paper. The importance of applying technology to work will result in agencies and organizations have more efficiency quality of working processes.



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The Effects of off-balance Sheet Financing Types and Directional Preference on Investors’ Perceived Credibility in Financial Reporting

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ABSTRACT

This research study was carried out as an experimental research. Its objectives were to study the impact of off-balance sheet financing types and investors’ directional preference on investors’ perceived credibility in financial reporting. This research is of 2 x 3 full factorial between subject design that manipulates (1) the type of off-balance sheet financing (operating lease vs. unconsolidated subsidiaries) and (2) the participant’s investment position (short, long and neutral). The subject groups involved in the study were 186 MBA students. The research findings showed that (1) given by the investors’ knowledge of creative accounting, the research provides evidence that long investors were biased from their directional goal for the firm’s positive performance as compared to prospective investor (2) complexity level of off-balance sheet types did not affect investors’ perceived credibility in financial reporting, and (3) the investors’ knowledge of creative accounting was inversely correlated to their perceived credibility of financial statements. The implication of the findings could serve as a caution for non-professional investors that investment preference could undermine their rationale and reduce their ability to assess credibility of manipulated financial reporting. The results also suggested that investors’ knowledge of creative accounting should be treated as a control variable in accounting research on investors’ perceived credibility of financial statements when they face with accounting manipulations.

Keywords: *Directional Preference, Financial Reporting, Off-balance Sheet Financing*

INTRODUCTION

Off-balance sheet financing is one kind of creative accounting that has long been tools employed by management to hide financial risks. Enron, which was found to create over 3,000 off-balance sheet special-purpose entities (SPEs), was one of the most notorious examples involved in such a dishonest practice (Klee & Butler, 2002). Following the collapse of Enron, investors’ trust in the publically available financial reports had eroded and the stock markets plunged due to accounting manipulation. Previous studies showed that audit quality and audit reputation moderate opportunistic behavior of management in manipulating accounting number. Kanagaretnam, Lim, & Lobo (2010) found significant relation between auditor reputation and accounting manipulation. In Thailand, Wajeetongratana (2015) also provided evidence that audit quality factor influence the reputation of the certified public accountants in Thailand by accuracy auditing, objectiveness auditing, and clearness auditing. However, although auditors knew that firms were concealing debts using these techniques, they hardly mentioned in their professional opinions as the action taken by the firms was viewed as not in violation of GAAP. The inability to detect hidden financial risk could misdirect investment and thus incurred great costs on investors. Thus, this research aimed to explore how mechanism of directional preference could induce or reduce investors’ perceived credibility in

financial reporting when dealing with off-balance sheet accounting. This study also concerned with the ability of non-professional investors to recognize and deal with off-balance sheet financing in both less and more complex structure. Examples of the conventional concealing methods are the unconsolidated subsidiaries and lease accounting; nevertheless, even the users of the financial statements can refer to the accounting footnote for verification, the investors sometimes met with limited disclosure, thus making the off-balance sheet arrangements even more incomprehensible to investors. The inability to detect hidden financial risk can misdirect investment and thus incur great costs on investors. Therefore, this study concerned with the ability of non-professional investors to assess credibility of financial reporting with both and non-transparency off-balance sheet financing. In addition, this research work investigated the effects of investment preference on investors' judgment when they had to assess credibility of financial.

LITERATURE & THEORY

Agency Theory

According to the agency theory, conflicts between manager and owner may be the cause of creative accounting practices (Tassadaq & Malik, 2015) because management takes decision to safe their interests instead of owners. Firms are motivated from various economic reasons to engage in off-balance sheet financing as these tools provide them with high debt rating, tax shelter, and impressive financial performance. Besides, off-balance sheet financing sometimes even resolves underinvestment problems arising from agency cost of debt (Shah & Thakor, 1987; John & John, 1991; Lim, Mann, & Mihov, 2003; Mills & Newberry, 2005; Zhang, 2006;). This study restricts analysis to two types of off-balance sheet techniques, i.e., operating lease and unconsolidated subsidiaries. Operating lease is regarded as a surrogate for transparent (less complex) off-balance sheet financing while unconsolidated subsidiaries as a surrogate for non-transparent (more complex) off-balance sheet financing.

Operating lease is the most common path by which firms use to avoid posting debt on the balance sheet and has been a loophole in the accounting standards that allow corporate managers to exploit for a very long time. Corporate managers could deceive investors and creditors by reporting leases as operating leases and pretending that the firms had no lease obligations (Ketz, 2003). Corporate managers use operating lease as a tool to hide debt off-balance sheet because of its legitimate advantages (Edman, 2011). When a company acquires an asset through debt financing, a liability present in its financial statements tells investors of the claims against the company's future revenue. However, if the asset is leased, no debt is posted on balance sheet even though the company has entered into lease contract and is committed to making lease payments in the future. Even under the proposed new lease standard, corporate managers can still structure the lease contract that they can circumvent the rules by exploiting the short term lease exemption. The lessee and the lessor can collude in signing a short term contract that, in fact, is intended to continue in the future but does not contain renewal option in the contract. Therefore, using operating lease as a tool for off-balance sheet financing can exist even after the implementation of the new accounting standard. Moreover, research works on operating lease issues could thus still benefit the standard setters and financial statement users.

Unconsolidated subsidiary is one of several accounting mechanisms that firms employ to hide liabilities. When a company has a significant control over the operation of another entity, it tends to structure the voting power or percentage of shareholding in ways that avoid consolidation and at the same time resort to the equity method of accounting. Under the equity method, firms will report the investment in an affiliated company as a single-line item in the balance sheet, net debts of the investee with its assets in the parent's investment account. Since assets are typically greater than liabilities, this net amount results in a balance on the left-hand side, thus excluding the investee's debts from analysis. Wiedman and Wier (1999) provided empirical evidence that disclosures related to unconsolidated subsidiaries were insufficient for users to form an accurate picture of consolidated leverage. Bauman (2003) reviewed footnote disclosures related to off-balance sheet activities concealed by the equity method of accounting and found that financial statement users could use footnote information to consolidate investee on a pro forma basis. At the present, available disclosures however are insufficient for investors to make accurate and useful analytical adjustment.

The different levels of complexity in transaction and disclosures of information related to the transactions between operating lease and unconsolidated subsidiaries allow for test of the usefulness of the current footnotes. Prior research suggested that investors relied on footnote information for off-balance sheet transactions. Davis-Friday, Folami, Liu, and Mittelstaedt (1999) suggested that investor value obligation information provided in footnote; however, it was not adequate to substitute for the obligation recognized on balance sheet. Bauman (2003) found that currently provided disclosures related to equity method accounting were not sufficient for investors to make accurate and useful analytical adjustment. Therefore, the usefulness of disclosure related to off-balance sheet transactions is of interest in this paper. Disclosure levels of different kinds of off-balance sheet accounts are diverse. It is anticipated that investor facing with more complex schemes (unconsolidated subsidiaries) tend to perceived higher credibility in financial reporting than are less complex schemes (operating lease). I thus posit the following hypothesis:

H1: Investor facing with unconsolidated subsidiaries is more likely to give credibility to financial reporting than are those facing with operating lease.

Motivated Reasoning Theory

According to motivated reasoning theory, motivated reasoning is divided into two major categories (Kunda, 1990). The first category is reasoning driven by accuracy goal whereby people are motivated to be accurate by manipulating the importance of the task. The second category is reasoning driven by directional goal, which is of interest in this paper. Directional goal has been shown to bias reasoning of decision makers in many psychological studies. A large body of research suggests that people tend to give higher weight to information that favors their preference outcome, exhibit more skepticism on information that contradicts their desired goal, and do not realize that their process is biased by their goals. According to the existing body of literature, directional preference would induce skepticism and scrutiny to information processing of decision makers when faced with preference-inconsistent situations but would reduce skepticism when faced with preference-consistent situations (Ditto & Lopez, 1992; Ditto, Scepansky, Munro, Apanovitch, & Lockhart, 1998; Ditto, Munro, Apanovitch, Scepansky, & Lockhart, 2003). In the investment context, investors are motivated to hold directional preference according to their investment positions (Hales, 2007; Han & Tan, 2010; Thayer, 2011).

Cognitive Dissonance Theory

Cognitive dissonance theory proposes that when people experience psychological discomfort (dissonance), they strive to reduce it through either changing behaviors and cognitions or adding new cognitive elements (Festinger, 1962). People faced with this predicament will try to search for information that supports their prior decision and tend to discredit information that opposes their chosen choice. Festinger (1962) suggested that dissonance arises after a choice has been made. In the current research study, participants were informed that an investment position (either short or long) had already been assigned to each of them; and then all participants received current and prospective financial results of the company. As the financial results were impressive, dissonance was created in some participants. Participants in short condition perceived the information as unfavorable because it casted doubt on their future profitability and thereby was faced with a dissonance situation. In contrast, participants in long condition perceived the information as favorable because it reinforced their future profitability. Taken together, I thus expected that participants in short condition would give lower credibility to a company's financial result than those in long condition because short investors were expected to discredit unfavorable information. I posited the following hypothesis:

H2: Investors holding each investment position are likely to perceived credibility in financial reporting differently.

METHODS

This research was of 2 x 3 full factorial between subject design that manipulated (1) the type of creative accountings (operating lease vs. unconsolidated subsidiaries) and (2) the participant's investment position (short, long and neutral). A sample of 186 MBA students were invited and randomly assigned to one of six groups. The experiment began with training about investment and compensation criteria. Then, all participants were presented with the same information about the firm, presented good financial performance, excepted for information related to off-balance sheet transaction and investment position which would vary. The participants then went over the company's financial information. Afterward, they were asked to assess the likelihood that they gained or lost from this investment, based on the available financial information. The participants then were asked to assess credibility of accounting numbers presented in the firm's financial statements, which was measured on a scale that varies from 1 (not at all credible) to 7 (very credible). The experiment ended with the participants completing their demographic profile and providing answers to the manipulation check.

For experimental manipulation, the first manipulation was investment position. The lower earning benchmark was assigned to short position participants and the higher benchmark to long position participants, the approach of which was similar to previous studies on the investment positions (Hale, 2007; Han & Tan, 2009; Thayer, 2011). In this research study, all participants were presented with good financial performance so that the preference-consistent behavior could be induced in those with long position and the preference-inconsistent behavior in those with short condition as the long position participants would prefer higher performance than their short position counterparts. The second manipulation was made on types of creative accountings. The participants faced two kinds of OBS techniques: unconsolidated subsidiaries and operating lease. The footnote disclosure and accounting policy related to each OBS transaction were presented following the company overview.

RESULTS

It was found that the investors' knowledge of creative accounting was negatively correlated with the investors' perceived credibility (Pearson's correlation = -0.191, $p = 0.02$). Thus, to control it, the participating subjects were divided into the highly knowledgeable and low knowledgeable groups using the mean knowledge level as the cut-off point (mean = 4.61) when performing the ANOVA test. H1 expected that Investor facing with unconsolidated subsidiaries were more likely to give credibility to financial reporting than those facing with operating lease. In Table 1, the overall ANOVA results nevertheless indicate that the OBS types is insignificant ($p = 0.56$). The finding is in contrast to the researcher's prediction in which investor facing with more complex OBS and those facing with less complex one assess the credibility of financial statements in a similar fashion. Thus, the results do not support H1.

Table 1. ANOVA results

ANOVA Results for High knowledge group					
Source of variation	SS	df	MS	F	p
Model	1148.75	6	191.45	112.46	0.00
OBS	0.55	1	0.55	0.32	0.56
Position	9.81	2	4.90	2.88	0.06
OBS * Position	1.93	2	0.96	0.56	0.56
Error	170.24	100	1.70		
Total	1319.00	106			

H2 expected that investors holding each investment position were likely to perceived credibility in financial reporting differently. In Table 1, the overall ANOVA results indicate that the investment position

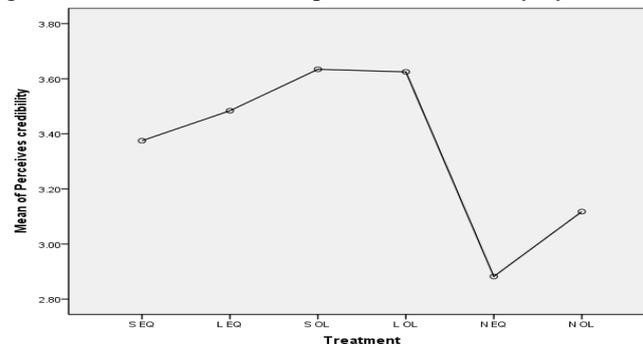
is marginally significant ($p = 0.06$). The finding is according to the researcher's prediction in which investor in different position do not assess the credibility of financial statements in the same way. Thus, the results support H2. To further test this finding difference, the researcher conducted a contrast analysis for specific comparison. The researcher speculated that a difference existed between investors with position versus without position.

Table 2. Planned contrasts

For High knowledge group (N=106) ^b				
Contrast ^a	Value of contrast	Std. error	t	p
1. Position – No position	3.01	1.30	2.31	0.02
2. Short – Neutral	1.29	0.70	1.84	0.06
3. Long – Neutral	1.71	0.72	2.38	0.01

To test this presumption, the researcher employed the planned comparisons with the following contrast weights: SEQ [1], LEQ [1], SOL [1], LOL [1], NEQ [-2], NOL [-2], where S, L, N, OL and EQ denote short, long, neutral, operating lease and equity method, respectively. In the high knowledge group, investors with position (long or short) statistically differed from those without position ($p=0.02$). Table 2 shows that, given high knowledge investors, the participants with position give higher credibility to the financial statement than those without position with a contrast value of 3.01. This suggests that the participants without position perform better than those with position. In Figure 1 the level of credibility perceived by the neutral group is markedly lower than those belonging to the short and long position groups. A plausible explanation is that investors with no stake in the company would adopt a more neutral stance than those taking either a short or long position because the former have no directional preference attributable to the compensation scheme tied to the firm's performance but instead receive a flat payment.

Figure 1: Means of investors' perceived credibility by condition



CONCLUSION AND FUTURE WORK

This study examines how Off-balance sheet financing types and investment preference affect investors' perceived credibility in manipulated financial reporting. Overall, significant results for perceived credibility were driven by highly knowledgeable participants. The result of the high knowledge group indicates that the long investors who favor positive firm's performance gave a higher credibility score to the manipulated financial statement than did the neutral investors. This is consistent with prior research in which investors have a tendency to give high credibility to information which is more aligned with their previously chosen investment position even though the credibility of the information is relatively low (Thayer, 2011). In addition, the result is supported by a recent study by Elliott, Rennekamp, and White (2015) who reported that current investors (long investors) view a firm's risk more optimistically than prospective investors (neutral investors). However, there is no evidence of motivated reasoning for investors with preference-inconsistency (i.e. short investors). Interestingly, the short investors were not

more skeptic nor gave a lower credibility rating to the financial statement in comparison with the neutral investors as having predicted by the researcher.

The results of this research work will increase an understanding among investors on how they can be biased by their investment positions because their choices of investment positions can produce directional preference that either induces or reduces their skepticism when they assess financial risk and information risk of the company. To accounting researchers, the implication of the findings is that investors' knowledge of creative accounting should be treated as a control variable in accounting research on investors' perceived credibility of financial statements when they face with accounting manipulations.

Future research should 1) seek to gauge investors' skepticism and incorporate it as a mediating variable to examine the influence of directional preference on their ability to assess credibility of financial information since this study did not measure investors' skepticism following their being presented with favorable (unfavorable) financial information for the long (short) investors, 2) investigate these effects in a negative performance setting to see the significance of the firm's poor performance since this research only used a positive performance setting, 3) endeavor to generalize the results through more experienced analysts or other groups of financial practitioners, and 4) attempt to identify mechanisms that can potentially lower the directional preference bias in the long and short investors, such as revenue recognition management and asset securitization.

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Desirable Properties of Accountants Scholaship of Establishments in Trat Province

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ABSTRACT

The study aimed to investigate the properties of the desirable characteristics of accountant in enterprises for approaching to ASEAN Economic Community in Trat province, and to study guidance for accountants to develop the desired properties of the enterprises in Trat province. A questionnaire was used as a tool to collect data in 5 aspects: 1) intellectual skill, 2) practical academic and functional skill, 3) personal attribute skill, 4) interpersonal interaction and communication skill and 5) organizational administration and business management skill.

The result of this study found that the majority of respondents agreed that the overall properties of the desirable characteristics of accountant were at a high level. When considering each side, it was found that the practical academic and functional skill were at the highest level which were able to deal with finance and accounting units: tax, cost accounting, accounting standards, auditing and managerial accounting, followed by the intellectual skill was able to analysis financial statement correctly. The interpersonal interaction and communication skills were able to work with others as a team work, and for the organizational administration and business management skills were able to implement the policy according to fairness. Finally, the personal attribute skill was able to coexist in a multicultural society and adapt to environment change.

Keyword: *Desirable properties, Accountants, Establishments*

INTRODUCTION

Federation of Accounting Professions officiates to supervise a professional accountant by following Accounting Act, B.E. 2000 about the laws of accounting and accountants in moralities and ethics. Accountants do not only follow the rules, but they also have to have professional skills in accounting. According to international standards for professional accountants, there are five skills for a professional accountant such as intellectual skills, technical and functional Skills, personal skills, interpersonal skills and communication and organizational and business management skills. Furthermore, accountants can analyze financial statement, control and manage risk including calculate and plan company's taxes. In each company, there are the different processes, as a result the need of accountants are not similar. A person who wants to be a profession accountant requires vocational certificate, high vocational certificate, bachelor's degree or master's degree. (Federation of Accounting Professions under the Royal Patronage of His Majesty the King: 2014)



Accounting is an activity for presenting the quantity data. It emphasizes to inform the knowledge and fact in finance to be useful for companies to make a decision in economic. The accurate and standard data system can be analyzed to compare and to plan the management of company. In addition, it can raise funds in financial market from both government and private sectors. A professional accountant is important to develop economic and society. The qualified worker should operation in appropriate profession (Suvanjudtha, et. al., 1991).

For the reasons above, authors interests to investigate the desirable characteristics of accountants to ASEAN Economic Community in enterprises in Trat province to be a professional accountant. The results of this study can be the basic knowledge and the guideline for accountants to improve their abilities, and they can apply their abilities for business benefits.

The objective of the study

To study the desirable properties of accountants to ASEAN Economic Community in enterprises in Trat province

Expected Benefits

1. To know the desirable properties of accountants to ASEAN Economic Community in enterprises in Trat province.
2. To be a guideline to improve the desirable properties of accountants to ASEAN Economic Community in enterprises in Trat province and related agencies.

LITERATURE & THEORY

Professional skills for a professional accountant

The objective of Federation of Accounting Professions is to encourage and improve accounting. They are also a member of International Federation of Accountants (IFAC). On October, 2003, IFAC Education Committee has approved International Education Standards for Professional Accountants (IESs). One of these IESs is about professional skills which aim to ensure that the person is ready for being a professional accountant of IFAC. Besides this international education standards can be a guideline to examine professional skills of accountants. The skill is one of abilities which a professional accountant must have to show their capacity. The abilities consist of knowledge, skill, professional values, moralities, and attitude. These abilities can be an indicator of potential which can apply in different environment.

The importance is to ensure that the education program in accounting has already included the improvement of knowledge, skill, professional values, moralities, and attitude. The abilities of a professional accountant consist of five skills as following:

1. Intellectual Skills

A person who needs to be a profession has to achieve the highest level of intellectual skill. This skill helps an accountant to solve problems and make a decision in complicated situation in the organization. Intellectual skills include the following skill.

- 1.1 To have abilities to determine, manage and understand the information from people, printing and electronic media.
- 1.2 To have abilities to ask a question, do a research, think logically and analyze
- 1.3 To have abilities to identify and solve problems

2. Technical and Functional Skills

Technical and functional skills include general and proper skills for a professional accountant. It contains five aspects below.

- 2.1 To have an expertise in number (Math and Statistic) and in information technology
- 2.2 Able to analyze a decision model and risk



- 2.3 Able to measure
- 2.4 Able to report
- 2.5 To have the knowledge of laws and rules

3. Personal Skills

Personal skills relates to attitude and behavior of a professional accountant. To improve these skills can help to learn and adjust personal characteristic.

- 3.1 The ability to manage yourself
- 3.2 To have an initiative, ability to convince and learn by yourself
- 3.3 The ability to choose and sort a limited resource and manage schedule to finish work
- 3.4 The ability to participate and adapt to change
- 3.5 To adapt professional values ethics and attitude to decision
- 3.6 To have a caution as a professional accountant

4. Interpersonal skill and Communication

Interpersonal skill and communication helps to operate with the other people in the organization in receive and deliver information. The components of skills interpersonal skill and communication includes as following.

- 4.1 A skill to solve the operation with other people in discussion conflict
- 4.2 A skill to operate in group
- 4.3 A skill to interacting with people of different cultures and opinions and to negotiate to find out the way of solving problems and determine the mutual agreement in professional situation
- 4.4 A skill to work in different cultures effectively
- 4.5 A skill to report and prevent your view efficiently through writing and speaking in formal and informal
- 4.6 A skill to listen and reading fluently included emphasize the importance of different culture and language

5. Organizational and Business Management Skills

In the past, the role of accountants was limited in collecting the data for the organization but not now. The management skills include:

- 5.1 Strategic planning, project management, personnel and resource management as well as making a decision
- 5.2 The ability to share tasks to motivate and develop personnel
- 5.3 Leadership
- 5.4 Professional judgment and making a decision

The appropriate skills help a professional accountant to efficiently apply knowledge. To improve these skills successfully, educational program and real experience have to be studied together. Most of professional skills must have ethics.

Qualifications of a professional accountant basing on International Education Standard (IES)

Federation of accounting profession under the royal patronage of his majesty the king determines the qualifications of a professional accountant which must follow International education standard (IES). IES is set by International Federation of Accountants. The qualifications of a professional accountant are as follow.

- 1. A professional accountant must graduate at least Bachelor’s degree of accounting or equal from University which has an admission system. There is an efficient management in the curriculum that helps students get an effective education. The number 2 of IES has three aspect of knowledge in the curriculum such as financial Accounting, other relevant knowledge and business knowledge of company.
 - 2. A professional accountant must have professional skills.
 - 2.1 Intelligence skills



- 2.2 Academic and functional skills
- 2.3 Personality Skills
- 2.4 Interpersonal skills and communication
- 2.5 Organizational and business management skills
- 3. Professional accountants must have good values and ethical attitudes towards the profession.
 - 3.1 Social responsibility
 - 3.2 Honesty in the profession
 - 3.3 Ability to keep the secret
 - 3.4 Independence
- 4. A professional accountant must have a practical experience enough to represent the profession in accounting included the good attitude toward the profession and is controlled by the responsible department. Moreover, there is the standard verification process.
- 5. A professional accountant must pass the assessment of professional competence.
- 6. A professional accountant must continue studying endlessly as a duty to improve and maintain the professional skills. There are the rules and regulations for accountants to develop their professional knowledge continuously. In the number 8 of IES, it mentions that abilities of a professional accountant must have skills in auditing, finance and advanced account reporting including information technology and important skills for auditing.

METHODS

Population in this study was 112 accountants from 7 accounting office in Mueang district in Trat province. (Department of Business Development, 2016) The questionnaire was applied for collecting the data which consists of personal information, desirable properties of accountants and recommendation. The reliable equal 0.832 Statistics used in the study were descriptive statistics such as frequency, percentage, and standard deviation.

RESULTS

1. Most of accountants in this study were females who were 31-35 years old. Their education was in undergraduate level, and they have experience in 1-2 year. Moreover, they have 2 times improved their professional skills. In accounting office, there are 50-60 customers as shown in the Table 1.

Table 1. General information of accounting and accounting office in Trat province

Information	Number	Percentage
1. Gender		
1.1 Male	14	12.50
1.2 Female	98	87.50
Total	112	100.00
2. Age		
2.1 Under 25 years old	19	16.96
2.2 25 - 30 years old	28	25.00
2.3 31 - 35 years old	31	27.68
2.4 36 - 40 years old	17	15.18
2.5 41 - 45 years old	11	9.82
2.6 Upper 45 years old	6	5.36
Total	112	100.00
3. Level of education		



3.1 Undergraduate	62	55.36
3.2 Bachelor’s degree	46	41.07
3.3 Postgraduate	4	3.57
Total	112	100.00
4. Experience in work		
4.1 lower 1 year	40	35.71
4.2 1 - 2 year	43	38.39
4.3 3 - 4 year	19	16.96
4.4 more than 5 year	10	8.94
Total	112	100.00
5. Number of improvement in professional		
5.1 never	9	8.04
5.2 1 time	18	16.07
5.3 2 time	46	41.07
5.4 3 time	31	27.68
5.5 more than 3 time	8	7.14
Total	112	100.00
6. Number of customer in accounting office		
6.1 lower than 50	26	23.21
6.2 50 - 60	42	37.50
6.3 61 - 70	12	10.71
6.4 more than 70	32	28.58
Total	112	100.00

2. The result based on the purpose shows the overall of the desirable properties of accountants that was great. The most qualification is academic and functional skills. The next qualifications are intellectual skills, interpersonal skills and communication, corporate management skills and business management. In addition, the moderate qualification is personality skills as revealed in Table 2.

Table 2. Average and standard deviation of opinions on the desirable properties of accountants to the ASEAN community

The desirable properties of accountants to the ASEAN community	\bar{x}	S.D.	Opinion level
1. Intellectual skills	3.94	1.00	Great
2. Academic and functional skills	4.52	0.03	Excellent
3. Personality skills	3.05	0.18	Moderate
4. Interpersonal skills and communication	3.59	0.11	Great
5. Organization and business management skills	3.52	0.05	Great
Overall	3.72	0.27	Great

2.1 The result of the desirable properties of accountants to the ASEAN community in intellectual aspect is great. The first intellectual aspect is knowledge in financial analysis effectively. The second intellectual aspect is knowledge and ability to work. The third intellectual aspect is ability to adapt technology to accounting. The fourth intellectual aspect is knowledge of finance and related knowledge. The final intellectual aspect is good knowledge of the language respectively as showed in Table 3 below.

Table 3. Average and standard deviation of opinions on the desirable properties of accountants to the ASEAN community of Intellectual skills



Intellectual skills	\bar{x}	S.D.	Opinion level
1. Knowledge of finance and related knowledge	3.60	1.22	Great
2. Knowledge and ability to work	3.88	1.01	Great
3. Ability to adapt technology to accounting	3.72	1.06	Great
4. Knowledge in financial analysis effectively	4.51	0.77	Excellent
5. Good knowledge of the language	3.41	1.15	Moderate
Overall	3.82	1.04	Great

2.2 The result of the desirable properties of accountants to the ASEAN community in academic and functional skills is excellent. The first aspect is the ability to financial accounting, such as taxation, cost accounting and audit and management accounting. Next, the second aspect is to check the work carefully and always in accordance with accounting principles to prevent damage to the business. The third aspect is to record transactions in the account correctly and comply with accounting standards. Then, it is knowledge of business law and practical. The last aspect is the ability to use accounting program.

Table 4. Average and standard deviation of opinions on the desirable properties of accountants to the ASEAN community of academic and functional skills

Academic and functional skills	\bar{x}	S.D.	Opinion level
1. Knowledge of business law and practical	4.47	0.74	Great
2. The ability to use accounting program	4.38	0.73	Great
3. The ability to financial accounting such as taxation, cost accounting and audit and management accounting	4.64	0.72	Excellent
4. To check the work carefully and always in accordance with accounting principles to prevent damage to the business	4.60	0.66	Excellent
5. Record transactions in the account correctly and comply with accounting standards	4.54	0.78	Excellent
Overall	4.53	0.72	Excellent

2.3 The result of the desirable properties of accountants to the ASEAN community in personality skills is moderate. Firstly, it's the ability to live with others in society and adapt to the changing environment. Helping and sacrificing for the community is the second aspect. The third is to be creative. Next, it's the ability to take advantage of professional knowledge, ethics and attitude to decision. Then, it is honesty and fairness. The last aspect is to have a responsibility for their duties and roles.

Table 5. Average and standard deviation of opinions on the desirable properties of accountants to the ASEAN community of personality skills

personality skills	\bar{x}	S.D.	Opinion level
1. The ability to take advantage of professional knowledge, ethics and attitude to decision	2.74	0.87	Moderate
2. Be creative	2.85	0.97	Moderate
3. To have a responsibility for their duties and roles	2.71	0.91	Moderate
4. Helping and sacrificing for the community.	3.58	1.32	Great
5. The ability to live with others in society and adapt to the changing environment	3.69	1.21	Great
6. Honesty and fairness	2.73	0.93	Moderate
Overall	3.05	1.03	Moderate



2.4 The result of the desirable properties of accountants to the ASEAN community in interpersonal skills and communication is great. The first aspect is to be teamwork and work in team. Secondly, it's to show their opinions through formal and informal speaking and writing effectively. Thirdly, it's to be able to work in different culture effectively. Then, it is to have responsibility for their own work and do not abandon responsibility for others. The last is to be able to negotiate for an acceptable conclusion or agreement.

Table 6. Average and standard deviation of opinions on the desirable properties of accountants to the ASEAN community of interpersonal skills and communication

Interpersonal skills and communication	\bar{x}	S.D.	Opinion level
1. To be able to work in different culture effectively	3.55	1.08	Great
2. To have responsibility for their own work and do not abandon responsibility for others	3.52	0.93	Great
3. To be able to negotiate for an acceptable conclusion or agreement	3.41	1.19	Moderate
4. To be teamwork and work in team	3.84	1.00	Great
5. To show their opinions through formal and informal speaking and writing effectively	3.66	0.88	Great
Overall	3.59	1.01	Great

2.5 The result of the desirable properties of accountants to the ASEAN community in organization and business management skills is great. The first is to have the ability to implement policies and practices fairly. Secondly, it's to have self-confidence and leadership and be accepted by others. Thirdly, it's to have the ability to plan your business strategy. The next is to have the ability to consider and make decisions as professional. Finally, it's to be fair, honest and work with caution.

Table 7. Average and standard deviation of opinions on the desirable properties of accountants to the ASEAN community of organization and business management skills

Organization and business management skills	\bar{x}	S.D.	Opinion level
1. To have the ability to implement policies and practices fairly	4.03	0.94	Great
2. To be fair, honest and work with caution	3.22	0.83	Moderate
3. To have the ability to consider and make decisions as professional	3.25	0.88	Moderate
4. To have the ability to plan your business strategy	3.29	0.98	Moderate
5. To have self-confidence and leadership and be accepted by others	3.83	0.88	Great
Overall	3.52	0.90	Great

CONCLUSION AND FUTURE WORK

Conclusion

For the study of the desirable properties of accountants to ASEAN Economic Community in enterprises in Trat province can discuss as follow;

1. The overall of the opinion of intellectual skills is great. The most aspect is having a good knowledge in financial analysis. This is in according with the research of Mongkhon Kittiwutikrai and Manatsada Chaisawaneeyakorn (2017) that studied characteristics of Graduate Accounting in Needs of Enterprises in Mukdahan Province. The intellectual was great. In addition, according to Lakkana Dumchu (2015) studied



the desirable properties of accountants in the intellectual that found the great level of the opinion. Accountants must have the ability to analyze data and abstract in order to understand.

2. The overall of the opinion of academic and functional skills is excellent. The most aspect is the ability to financial accounting such as taxation, cost accounting and audit and management accounting. It isn't in according with Sirima Boonkuson and Tanasak Kaykratok (2016) who studied the desirable properties of accountants in academic and functional skills. It found the great opinion because accountants can record accounts accurately and in accordance with accounting standards and reliable and able to use Microsoft Office to compute and presentations.

3. The overall of the opinion of personality skills is moderate. The most aspect is the ability to live with others in society and adapt to the changing environment. It isn't in according with the research of Sirima Boonkuson and Tanasak Kaykratok (2016) that investigated studied the desirable properties of accountants in personal skills. It found the great excellent. Accountants must be responsible for the work that is endorsed, tolerated, and intended to work.

4. The overall of the opinion of interpersonal skills and communication is great. The most aspect is to be teamwork and work in team. It is in according with Mongkhon Kittiwutikrai and Manatsada Chaisawaneeyakorn (2017) that studied characteristics of graduate accounting in needs of enterprises in Mukdahan province in interpersonal skills and communication. It revealed the great opinion as accountants have an interaction and have different opinions to promote and encourage more effective work. They can also negotiate for an acceptable conclusion or agreement and work as a team.

5. The overall of the opinion of organization and business management skills is great. The most aspect is to have the ability to implement policies and practices fairly. It related to the study of Mongkhon Kittiwutikrai and Manatsada Chaisawaneeyakorn (2017) that studied characteristics of graduate accounting in needs of enterprises in Mukdahan province in organization and business management skills. It showed the great opinion. Accountants have the ability to make decisions as an accounting professor. They also have the ability to apply the principles to work for more efficiency. Moreover, they have the ability to organize and assign tasks and assignments.

Future work

There should be the study of improvement in the desirable properties of accountants to ASEAN Economic Community in enterprises in other provinces or countries for assess the potential of Thai accountants and prepare to develop professional skills for the needs of the labor market.

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International Schools: A Fountainhead of Future International Business Managers

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ABSTRACT

This study explored some of the advantages and disadvantages of an ‘international school’ education in terms of generating key skills for a career as an international business (IB) manager. Building on extant literatures in education and IB, as well as some exploratory interviews, we generate several propositions positing the effects of an international school education on an IB career. Though much of the discourse focuses on the positive aspects in this regard, this study also discusses a number of potential disadvantages.

Keywords: *International Business, International Schools*

INTRODUCTION

In an increasingly competitive and interconnected world, the appetite for an ‘international school’ education has shown remarkable growth in recent times (Keller, 2015). Complementing these schools’ enviable ‘hard’ infrastructure (sporting facilities, diverse meal choices and the like) are their ‘softer’ but arguably more important characteristics. I refer in particular to the culturally diverse student, parent, board, and teacher bodies (McKenzie, 1998). Throw in a balanced curriculum – which increasingly culminates in an International Baccalaureate diploma – and all the ingredients appear to be in place to prepare students for managerial positions in an ever-globalizing marketplace (Resnik, 2008).

However, relatively few IB researchers have explored how an international school education impacts careers in international management. Working across national and cultural boundaries is challenging; expatriate failure rates, for instance, are estimated to be as high as 70 per cent (Chiu, Wu, Zhuang, & Hsu, 2009), with poor cultural adjustment on the part of the expatriate him/herself often being the chief cause (Abdul Malek, Budhwar, & Reiche, 2015). As such, scholarly effort in resolving such problems remains intense (Bader & Schuster, 2015). For example, much has been written about the importance of cultural intelligence during the expatriate selection process, with some authors going as far as placing it above technical aptitude (Leiba-O’Sullivan, 1999). While these are certainly admirable initiatives and ideas, my aim here is to build on these contributions by exploring the potential benefits of an international school education for an IB career.

The remainder of this paper comprises an additional four sections. Following a review of the literature on international schools and IB careers, I explain the methods used. After presenting the study’s key findings, I discuss the significance and meaning of these findings. The paper ends with a brief conclusion and an overview of the practical implications arising from the study.

LITERATURE REVIEW

International business careers



An ‘IB career’ is admittedly a rather vague term so it is important to establish its actual meaning insofar as this paper is concerned. Since we live in an increasingly interconnected world, I believe that the concept of an IB career should not be limited to just executives who cross national borders for work (i.e., expatriates), though of course this category of managers represents the very paragon of IB professionals. One can, to a lesser extent, pursue an IB career even without leaving one’s home country. A multinational enterprise (MNE) adopting a polycentric (or even a geocentric) approach to managing people can very well hire a host-country national (HCN) to supervise and oversee operations in that country. Thus an IB career is not strictly confined to expatriates; as globalizing forces ‘shrink’ the world, *international* business is to be found closer and closer to home.

Whether working at home or abroad, arguably the most important aspect of an IB career is the encountering of cultural diversity. Despite the interconnectedness alluded to above, the ‘global’ business landscape is, paradoxically, characterized by the continued importance of divergent *local* cultural contexts (Meyer, Mudambi, & Narula, 2011). These cultural differences have proven to be perhaps the dominant obstacle to for IB managers, as the literature on expatriate adjustment has revealed time and again (Okpara & Kabongo, 2011; Shaffer & Harrison, 1998; Tung, 1987; Wang, Feng, Freeman, Fan, & Zhu, 2014). Working across cultural borders involves confronting value and norms that diverge from, and sometimes even conflict with, one’s own.

Hofstede (1994) defines culture as “the collective programming of the mind which distinguishes the members of one category of people from another”. Thus it is to be expected that many managers whose work entails the frequent crossing of cultural boundaries will find it difficult to, as each of us has been ‘programmed’ in distinct ways by our culture. However, the extent to which managers struggle in cross-cultural management differs for various reasons. Researchers have highlighted, for example, the importance of personality traits (Peltokorpi & Froese, 2012), country-of-origin (Tungli & Peiperl, 2009), and compensation packages (Lauring & Selmer, 2009). While these are undoubtedly important factors, I believe the external environment, particularly one’s cultural background, merits closer consideration. Cross-cultural competence (CCC), which Gertsen (1990) defines as the “ability to function effectively in another culture”. Studies have demonstrated that CCC, and its close associate ‘cultural intelligence’, have a positive effect on adjustment and performance (Abdul, Malek, & Budhwar, 2013; Wang et al., 2014). In other words, IB managers who are able to interact and empathize with people from different cultural identities are more likely to function effectively at work (Elenkov & Manev, 2009). Thus, while CCC and success as an IB manager may be related to aspects of one’s personality or country of origin, we should be careful not to overlook the potential influence of one’s wider cultural background (Eid & Diener, 2001; Gunkel, Schlager, & Engle, 2014), which is the focus of this study. In particular, it is important to analyze the institutions that mold and shape one’s outlook and ‘soft skills’, such as one’s schooling background.

International schools

Although there is some uncertainty within the literature on how best to define international schools, Hill (2007) describes them as independent fee-charging institutions that cater specifically for students of many nationalities, and with (usually) English-language educational programs that differ from that of the host country. As reflected Hill’s description, these educational establishments are in many ways symbolic of our increasingly interconnected world. Indeed, their very existence is tied in with the growing interconnectedness we have witnessed over the last century or so (MacDonald, 2006). Accompanying the surge in cross-border diplomatic and business relations has been a desire among expatriate parents to ensure the educational needs of their offspring are not jeopardized (Hill, 2007; MacKenzie, 2009). Thus, one observes a plethora of international schools across the various global centers of business. In Asia alone, there are over 5,000 such schools (Machin, forthcoming). Increasingly, however, these schools are not the preserve of mobile expatriate children; a growing number of financially privileged host-country nationals are also eager to enroll their children in these institutions (Ng, 2012; Tanu, 2014).

What drives this seemingly incessant demand? Arguably the chief reason is the globally renowned educational experience it provides. In terms of curricula, most of these schools are structured on Western European or North



American formats, which are much sought-after by parents and employers (Nguyen & Nguyen, 2017). Teaching and learning methods are seen to be up-to-date, class sizes are usually smaller than in local public schools, and many are equipped with desirable facilities beyond the reach of ‘normal’ educational establishments such as air-conditioned classrooms and top-of-the-range sporting amenities (Tanu, 2014). But there exists an additional, more subtle set of motivating factors centered on culture, identity, and status. Based on western educational systems, these schools naturally embrace a liberal-humanist framework, which they use to appeal to students and to validate their existence (Tamatea, 2008). Many parents, particularly in Asia, view these schools as a means of attaining or reinforcing a certain elite status or prestige within society (Dunne & Edwards, 2010).

A term often associated with international schools is ‘third culture kids’ (TCKs), a concept introduced by sociologists in the 1960s to refer to children accompanying their parents to other countries (Useem, Donoghue, & Useem, 1963). Since then, of course, the phenomenon of an international upbringing has taken off, as reflected in the evolution of the original definition. Pollock and Van Reken (2001), for instance, define a TCK as a person who has spent a significant part of his or her developmental years outside the parents’ culture. The TCK frequently builds relationships to all of the cultures, while not having full ownership in any. Although elements from each culture are assimilated into the TCK’s life experience, their sense of belonging is in relationship to others of similar background (other TCKs).

An important point of departure in this definition from that of Useem et al.’s (1963) is the absence of the word ‘country/ies’. That is, one may be raised in one’s ‘home’ country by local parents and yet remain outside the predominant local culture. One way, of course, is through an international school education, where the educational curricula, population, and general atmosphere have a more ‘global’ feel, or certainly one that is not ‘locally’ oriented.

TCKs are frequently portrayed as the ultimate cultural acrobats, equipped with the flexibility to adapt more readily than others to cross-cultural encounters. In short, they are seen as having a particularly strong degree of cultural intelligence. While this may indeed be true for many TCKs, the definition above hints at some caution: not having full ownership in any culture; feeling a sense of belonging only (or at least primarily) to fellow TCKs. In a 2015 opinion piece in the South China Morning Post, historian and writer Jason Wordie picked up on this theme when he criticized many Hong Kong-based TCKs (or ‘expat brats’, as he called them) for existing in something of an exclusive bubble: disconnected from and largely ignorant of mainstream culture, unable to converse in Cantonese, and leveraging on parental connections to attain prestigious jobs upon returning to the island after attending university ‘back home’. In the same outlet, Zahid Mughal (2015), a TCK himself, concurred with much of Wordie’s observation, writing that his international schooling in Hong Kong equipped him and many others like him with only a superficial understanding of and interest in local political and cultural affairs. Rather than instilling cultural awareness and adaptability, his international school experience resulted in exclusion and isolation from the society he calls ‘home’. Turning to the scholarly literature, there is some support for these points: in Vietnam, found that while international schools are successful in strengthening connections with Western ideologies in local students, this often comes at the expense of enthusiasm to immerse themselves in local markets and contexts.

For some expatriate parents, this ‘risk’ of raising an ‘expat brat’ detached from the presiding culture of his/her host country that has led them to enroll their children in local schools, even with the option of an international school education available to them. Again, take Hong Kong, where Groves & O’Connor (2018) recently conducted a study of western expatriates who have opted for Cantonese-language local schools for their children. One of the key reasons for this was that, for several parents in their sample, there exists a subtle but important distinction between ‘global citizens’ and ‘TCKs’, who, as Wordie argues, may end up in an expat bubble. In other words, there is more perceived value in the former than the latter, and some parents appear unconvinced that an international school is the best place to cultivate it.

Clearly not everyone views international schools positively. In particular, how and to what extent they help or hinder students pursuing careers in international business (which, it would seem, should be among their main



objectives) is unclear.

METHODS

This paper represents the initial phase of an exploratory study and the methods adopted reflect this. Specifically, our data had been gathered through semi-structured interviews with executives actively engaged in the IB domain (either as expatriates or with MNEs in their home country) and who had spent at least five years of their childhood attending international schools. Though quantitative, survey-based methods allowed for larger sample sizes, the strength of interviews lied in their ability to generate depth and subtlety, which was what I aimed for here. The open-ended questions that had been utilized probe how these managers’ experience at these schools had impacted their approach to IB, particularly the issue of cross-cultural management. The interviews conducted hitherto had been tape-recorded and transcribed. These transcriptions had then been examined for relevant dimensions and concepts. The study was set in Malaysia, which provided an appropriate context for this study given its multicultural demographics and growing presence in global business.

FINDINGS

The profiles of the two respondents who had participated in the preliminary stage of this study are presented in Table 1 below.

Table 1.
Profile of initial respondents

Pseudonym	Age	Home country	Years in international school	Location of international schools
Anna	40s	Sweden	6	• Portugal
Charles	30s	Malaysia	13	• Malaysia

At this point in the investigation, there has been something of a mixed bag in terms of the findings. Anna was largely positive in her view of how her international school education had impacted her career in IB. She recounted how her years as a pupil at an international school in Portugal opened her eyes to a different way of life to that which she observed in her home country of Sweden. One area in particular about which she waxed lyrical was the linguistic opportunity it provided. Not only was she able to enhance her English (the medium of instruction at her school) but she also acquired an ability to speak Portuguese, which, she noted, has also benefited her at times when working with Lusophones.

Charles, on the other hand, felt that the international schools he attended in Malaysia did not sufficiently emphasize the usage of Malay, including among Malaysians. “I’m not sure if this still happens, but the kids at my school – and I’m talking about the Malaysian kids – had almost no interest in the Malay language. To this day, nearly all my classmates are barely able to string a sentence together in Malay, and they’re not in the slightest bothered about it.” As a result, Charles felt there was a gap between him and his Malaysian colleagues, the vast majority of whom attended state schools and were thus fluent speakers of Malay as well as enjoying a greater attachment to local humor and topics. Charles added that the elite status of international schools in the country means there was also something of a class divide between him and his subordinates, which added to management difficulties. On the plus side, however, he added that the exposure to an eclectic cultures as well as studying more



‘worldly’ history and events (at the cost, he confessed, to local affairs) that he enjoyed at school meant that he had been able to quickly find points of common interest when dealing with partners and clients from various parts of the world.

Another interesting theme that has emerged thus far concerns Anna’s struggles to adjust when returning to Sweden, which she has done twice in her career and only for brief periods. Like Charles, Anna alluded to a ‘global’ culture that connects international school pupils and alumni. While this has certain benefits, both Anna and Charles opined that it also distanced oneself from one’s ‘home’ country. “You grow up watching American and British shows, but you also interact every day with other kids from all over the world. In the end, you’re neither here nor there in a sense; you aren’t really ‘Swedish’ but you aren’t really ‘Portuguese’ either. You’re a bit of both and neither of them at the same time!”

DISCUSSION AND CONCLUSION

This paper represents the initial phase of a study investigating the ways in which an international school education impacts a career in IB. As such, it is based primarily on a review of the related literature as well as some preliminary interviews. The study indicates that there an international school education is, on the whole, advantageous from the perspective of developing future IB managers given its multicultural atmosphere as well as the opportunities it provides for networking and developing a ‘global’ mindset among pupils, which seems to persist into adulthood. Moreover, it cannot be denied that an international school education comes at a high price for parents, which is returned in the form of enviable facilities, smaller classroom sizes, and unique opportunities for children (e.g. class trips to foreign countries).

In sum, while there are certain privileges that international schools have in common with ‘national’ private (i.e. fee-paying) schools, they are set apart by their cosmopolitan nature, which in turn provides a somewhat inimitable space in which to cultivate and nurture the ‘global mindset’ widely coveted and commended in IB textbooks. However, there are also certain drawbacks that one should not overlook, such as what is in some cases of a very limited interaction with host-country nationals. In certain cases, international schools may be the preserve of expatriate children and the offspring of the very elite of local society, leaving the children with limited exposure to the more mainstream society of the country in which they actually reside. In other words, although *physically* in a particular country, there is a risk of existing within a ‘bubble of privilege’, leaving some expatriate parents in places like Hong Kong to actually forego an international school education for their children, opting instead for government schools – a phenomenon explored in a recent article by Julian Groves in the *South China Morning Post* (Groves, 2018).

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Antecedents and Consequences of Passion among Teachers: A Dualistic Model of Passion

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ABSTRACT

The present research purposes to investigate an antecedents and consequences of passion among teachers in private universities in Thailand based on Dualistic Model of Passion (DMP). Job demands and job resources (JD-R) considered as antecedent roles while job engagement and job satisfaction performed the roles as positive consequences and depression and burnout performed the roles as negative consequences. Job demands and job resources scale adapted by Bakker et al. (2004) and Xanthopoulou et al. (2007), Passion scales developed by Vallerand et al. 2003, job engagement and burnout scales developed by Schaufeli and Bakker (2004) and Schaufeli et al. (2002), job satisfaction adapted by Diener et al. (1985) and Houliort et al. (2013), and depression adapted by Radlof (1977) and Bakker et al. (2002). Structural Equation Modeling (SEM) employed to examine the relationship among the variables simultaneously followed by the development of the conceptual framework and the significant findings are discussed in detail.

Keywords: *Passion, Job Demands and Resources, Positive and Negative Consequences*

INTRODUCTION

A teacher is the most important person in social and educational development. According to the higher education commission, teacher must have a workload of not less than 35 hours a week including teaching tasks, research and other academic work, academic service obligations, the work of preserving arts and culture and other related tasks that are consistent with the mission of the higher education institution (The Civil Service Commission in Higher Education Institutes Act., 2015). It is important to develop the teacher as a person with the highest potential, and to build up knowledge, skills and abilities to achieve the proficiency of the profession and to keep up with the rapid changes in society. Unfortunately, it is obvious that a wide range of educational institutes have encouraged their teachers to excessively perform their tasks including front and back-office tasks. These tasks have been academically recognized as a primary cause of teachers’ burnout which could certainly lead to personally negative outcomes (Maslach & Schaufeli, 1993; Cordes, Dougherty, & Blum, 1997; Leiter & Maslach, 2003; Maslach, 2003; Schaufeli & Bakker, 2004). Therefore, the primary focus of this study was to investigate the causal effect of work-related factors including job demand and job resources on work engagement and job burnout and to test the moderating effect of dualistic factors of passion. As such, the researcher was interested to study factors predicting the fatigue of teachers. The results of the research were used as a guideline to policy formulation to prevent and reduce the problems.



LITERATURE & THEORY

Dualistic Model of Passion (DMP)

Dualistic model of passion (DMP) presented by Vallerand et al. (2003) to categorize the types of passion included harmonious passion and obsessive passion. Besides, Vallerand et al. (2003) demonstrated the assumption of DMP towards types of passion includes harmonious passion used to represent an autonomous internalization process, while obsessive passion employed to represent a controlled internalization process towards activity. Harmonious passion (HP) can be described the driving their activity by willingness or without contingencies attached to it, and the consequence of HP will be encouraged the positive outcomes during and after activity engagement. On the other hand, obsessive passion has differently assumption (Vallerand et al., 2003; Verner-Filion, Lafrenière & Vallerand, 2012). Obsessive passion (OP) can be explained the driving their activity by intrapersonal and interpersonal pressure or based on the contingencies attached to it, furthermore, the consequence of OP will be tended to negative outcomes during and after activity engagement (Vallerand et al., 2003; St-Louis & Vallerand, 2015). Consequently, DMP is the generalized concept which grounded by SDT to define the two forms of passion includes HP and OP to describe the behavior among participants towards activity that they love by willingness to do and pressuring to do respectively.

Job Demands and Job Resources Model

The job demands and resources or JD-R model is the concept employed to explain the specifically working condition because every job have to deal with specific risk factors, JD-R contained the two categories that can lead to a different outcomes of employees included strain and motivation factors respectively (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Job demands described to the cognitive, emotional and/or physical effort of skills that job required to stable when deal with the other things might not be sustained, for instance, the employee faced a bad physical environment, high work pressure, and interactions with clients with a negative emotional, hence, job demands can be turned to the strain factors when this situation required to high effort but employees might not be appropriately adjusted (Demerouti et al., 2001). Job resources explained to the psychological, physical, social, or firm perspectives of the job that enhanced the achieving work goals, reduce the job demands, and stimulate personal growth, development and learning (Demerouti et al., 2001; Bakker et al., 2004). Besides, Demerouti et al. (2001) implied the six main determinants included feedback, rewards, job control, participation, job security, and supervisor support.

Job Engagement

Job engagement is the prevalent issue in the human resource management area that presented by Kahn (1990). It is opposite to concept of job burnout that defined as the intrinsic motivation which referred to a persistent affective and cognitive, fulfilling and work-related state of mind in the positive direction, and also contained three opposite dimensions of job burnout included vigor, dedication, and absorption to explain this term (Schaufeli & Bakker, 2004). Vigor can be explained the level of persistence when face the trouble or willingness to invest the energy to effort in the task, dedication can be referred to the inspiration, pride, challenge, enthusiasm, and sense of significance towards a task, and absorption can be explained the situation the employee focused to work with the positively feeling (Bakker & Demerouti, 2007; Schaufeli et al., 2002).

Job Satisfaction

According to Locke (1969) had been defined the definition of job satisfaction based on Rand's theory of emotions that referred to the enjoyable emotion state resulting about the appraisal of one's job as facilitating the



achievement of one's job values.

Job Burnout

Job burnout had been categorized as the extraordinary type of stress syndrome which related to the occupational stress reaction among human service and their recipients to explain the disconnection between the employee and workplace through the importantly determinants called the multidimensional model of job burnout or multifaceted syndrome included emotional exhaustion, depersonalization (cynicism), and diminished personal accomplishment (inefficacy) (Schaufeli & Bakker, 2004). Emotional exhaustion can be referred to the feelings of employee towards strained and tired, depersonalization can be explained the isolation between employee and their job by uncaring, and diminished personal accomplishment referred to feelings of unskillfulness and lack to increase the productivity in their job (Leiter & Maslach, 2003). Furthermore, several scholars attempted to explain the association among the three determinants, for instance, Leiter and Maslach (2003) argued that emotional exhaustion seems as the essential point of burnout which affected another determinant.

Depression

Maslach and Schaufeli (1993) argued that depressive symptoms can be stimulated by the loss of social status, close friend, health or something significant to the individual environment in every perspective, while burnout can be triggered by the quality of the social environment in terms of work place.

RELATED WORKS

Job Demands – Resources and Job Engagement and Job Burnout

Hakanen, Bakker and Schaufeli (2006) examined the job burnout among the teachers and dentists in Finland based on cross sectional, the structural equational modeling had employed to describe this circumstances, the results found that job demands has a positive impact on job burnout and negative impact on job engagement significantly, while, job resources has a negative effect on job burnout and positive effect on job engagement significantly.

Harmonious and Obsessive passion and Job Engagement and Job Burnout

Trépanier et al. (2014) employed the structural equation modeling to explain job burnout among a nurses and teachers in Canada and Norway context, and found that the harmonious passion had a negative impact on burnout while obsessive passion had a positive impact, conversely, Mageau, and Vallerand (2007) found that the obsessive passion had a negative influence on activity engagement while harmonious passion had a positive influence on activity engagement.

Harmonious and Obsessive passion and Job Satisfaction and Depression

Houliort, Philippe, Vallerand and Ménard (2013) investigated the passion of 2,393 teachers for schools to describe the personal outcome in Canada context, the cross sectional had designed in this study, and the result of this research based on structural equation modelling found that the harmonious passion had a negative impact on depression, conversely, the obsessive passion had a positive impact on depression.

Job Demands – Resources and Harmonious and Obsessive Passion

Fernet et al. (2014) implied the impact of some determinants within the job demands and job resources in Canada context based on 246 novice teachers, the result found that the determinants of job demands can be



increased the degree of obsessive passion, while the determinants of job resources can be enhanced the degree of harmonious passion significantly, while Trépanier et al. (2014) indicated the job demands has a positive impact on harmonious passion but negative impact on obsessive passion based on 1,179 nurses and 745 teachers in Canada.

Job Demands – Resources and Satisfaction and Depression

Schaufeli and Taris (2014) implied the conceptual framework that job demands can be stimulated the degree of strain positively or contributed the negative outcomes, while job resources can be enhanced the degree of motivation or provided the positive outcomes.

Harmonious and Obsessive Passion as a Mediator Role

Fernet et al. (2014) and Mageau et al. (2005) confirmed the harmonious and obsessive passion mediated between job characteristics and determinants of burnout and affective and cognitive consequences, while Trépanier et al. (2014) indicated that only harmonious passion which mediated the relationship between job demands and resources and burnout and work engagement.

METHODS

Methods of Research Used

Investigating the antecedents and consequences of passion among teachers based on descriptive research was explained in terms of means and standard deviations and involved the calculation of a correlation coefficient to interpret the impact among the given variables directly and indirectly.

Respondents of the Study and Sampling Procedures

This investigation would pay attention to study the antecedents and consequences of passion among teachers in private universities in Thailand based on Dualistic Model of Passion (DMP). The potential population would be from a wide range of teachers in private higher educational institutes in Thailand. The Stratified sampling type was adopted from which the target population. It was divided into smaller portions and sample would be randomly drawn in according to specific characteristics in the target population. According to this sampling technique, the questionnaires would be distributed to employees within given private universities in Thailand.

Research Instruments

Job demands and job resources (JD-R) considered as antecedent roles while job engagement and job satisfaction performed the roles as positive consequences and depression and burnout performed the roles as negative consequences. Job demands and job resources scale adapted by Bakker et al. (2004) and Xanthopoulou et al. (2007), Passion scales developed by Vallerand et al. (2003), job engagement and burnout scales developed by Schaufeli and Bakker (2004) and Schaufeli et al. (2002), job satisfaction adapted by Diener et al. (1985) and Houliort et al. (2013), and depression adapted by Radlof (1977) and Bakker et al. (2002).

Statistical treatment of data

Structural Equation Modeling (SEM) was employed to examine the relationship among the variables, and simultaneously find out the significant before discussing in detail.



CONCEPTUAL FRAMEWORK

Roles and Variables

The conceptual framework of this investigation contained the roles and variables including (see figure1):

JD-R contained the two main latent variables included job demands (JDE) and job resources (JRE), the workload (work), emotional demand (emot), emotional dissonance (emod), and organizational change (orga), while job resources consist of autonomy, social support, supervisory coaching, and opportunities for professional development (Xanthopoulou et al., 2007). Furthermore, JD-R has been defined as exogenous variables in this framework.

DMP can be divided into two types of passion included obsessive passion (OBS) and harmonious passion (HAR), and fourteen items of questionnaire employed to represent the obsessive passion (obs1 to obs7) and harmonious passion (har1 to har3) (Vallerand et al., 2003). Besides, DMP has been defined as the endogenous and mediator variables in this framework.

Depression (DEP) can be classified as the group of job strain which contained four observe variables included somatic and retarded activity (soma), depressed affect (depr), and interpersonal (inter) (Bakker et al., 2002). Moreover, depression is defined as the endogenous and dependent variable in terms of negative consequence.

Burnout (BUR) can be defined as the group of job strain as well which consist of three observe variables included emotional exhaustion (exha), depersonalization or cynicism (cyni), and personal accomplishment or efficacy (proe) (Maslach & Schaufeli, 1993). Furthermore, burnout is identified as the endogenous and dependent variable within the group of negative consequences of this model.

Engagement (ENG) contained the three observe variables included vigor (vigo), dedication (dedi), and absorption (abso) (Schaufeli & Bakker, 2004; Schaufeli et al., 2002). This variable is defined as the endogenous and dependent variables within the group of job motivation.

Satisfaction (SAT) is defined as the endogenous and dependent variables within the group of job motivation as well, this factor consists of five items to explain the satisfaction (Diener et al., 1985)

Propositions

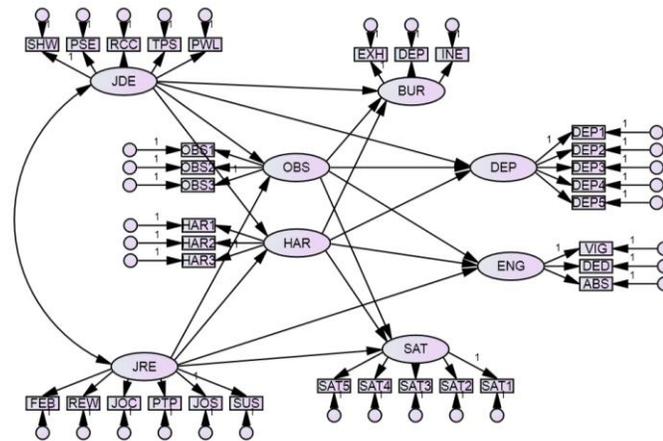
According to review of related literature and studies of previous scholars, hence, this investigation can be provided the propositions and relationship among the variables in terms of direct effect and indirect effect included following:

- P1: Job demand has a positive influence on (P1a) obsessive passion and negative on (P1b) harmonious passion.
- P2: Job resources have a positive influence on (P2a) harmonious passion and negative on (P2b) harmonious passion.
- P3: Harmonious passion has a negative impact on (P3a) burnout and (P3b) depression and has a positive impact on (P3c) engagement and (P3d) satisfaction.
- P4: Obsessive passion has a positive impact on (P4a) burnout and (P4b) depression, and has a negative impact on (P4c) engagement and (P4d) satisfaction.
- P5: Job demands have a positive influence on (H5a) burnout and (H5b) depression, and have a negative influence on (H5c) engagement and (H5d) satisfaction.
- H6: Job resources have a negative influence on (H6a) burnout and (H6b) depression, and have a positive influence on (H6c) engagement and (H6d) satisfaction.
- H7: There are an indirect influence of job demands and (H7a) burnout, (H7b) depression, (H7c)



- engagement, and (H7d) satisfaction by obsessive passion.
- H8: There are an indirect influence of job demands and (H8a) burnout, (H8b) depression, (H8c) engagement, and (H8d) satisfaction by harmonious passion.
- H9: There are an indirect influence of job resources and (H9a) burnout, (H9b) depression, (H9c) engagement, and (H9d) satisfaction by obsessive passion.
- H10: There are an indirect influence of job resources and (H10a) burnout, (H10b) depression, (H10c) engagement, and (H10d) satisfaction by obsessive passion.

Figure 1.
Conceptual framework



CONCLUSION AND FUTURE WORKS

While there is some ambiguity surrounding the concepts of passion and burnout, the brief review of the above papers attempts to explore all the relationships between these selected variables. This tentative model expects to provide the theoretical line of reasoning offered in the existing literature concerning the presence of a significant relationship between the given factors and most of the literature reviewed in this study was carried out on various research settings. Passion is expected to originate from work-related factors, such as job demand and job resources. However, the outcomes of this could lead to either negative ends (depression and burnout) or positive one’s work engagement and job satisfaction. For the future work, the empirical research needs to be done to confirm the results especially in the context of Thailand.

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Factors Enhancing the Effectiveness of Smart Hypermarket

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ABSTRACT

The influence of various factors on smart hypermarket, namely, innovation management, service quality, perceived value, awareness, satisfaction, and effectiveness is investigated in this work. Data collection focused primarily on expert in-depth interviews and general customer questionnaire in Bangkok Metropolitan and vicinity areas. The research deployed structural equation model and chi-square test statistics as the analysis tools. The approach established a conceptual framework to study the involvement of management innovation, set up variables to denoting related factors, and defined proper hypotheses on the relationships among these factors. One of the important outcomes revealed that service quality and innovation management have an indirect influence on enhancing effectiveness of smart hypermarket. Consequently, business entrepreneurs benefit from improvement of relevant activities that enhance maximal effectiveness of smart hypermarket for consumers. Future research should focus on the qualitative impacts among key factors and analysis of consumer psychology, whereby proper management innovation will be devised for the benefits of business entrepreneurs and consumers in this smart hypermarket of digital age.

Keywords: *Awareness, Effectiveness, Innovation Management, Perceived Value, Satisfaction, Service Quality*

INTRODUCTION

The digital age has brought about many economic and social technological innovations to global commerce and industry. These innovations help improve the standard of living and well-being of every citizen. The advent of hypermarket has brought about complex integration of commerce, technology, and service to furnish easy access to product data, purchase, and services. Since the consumers have many alternate selections from various manufacturers to decide on their purchase, business entrepreneurs must make all the provisions to serve the consumers well in every channel they can access. This inevitably calls for technology and innovation to enhance the supply chain so as to accommodate the consumers’ demands.

Meanwhile, the proliferation of information technology permits deeper consumer involvement in the business process, from marketing advertisement to payment, in conjunction with fierce competitions in relating business segments. Hypermarket entrepreneurs face a tall order to fulfill. One compelling issue is how the entrepreneurs cope with such rapid change, and prepare the transition to get themselves up to speed. This instigates an investigation on the role and influence of management innovation. The results of this study will entail better service quality, perceived value, awareness, and satisfaction, thereby enhancing the effectiveness of smart hypermarket in this digital age.

This paper is organized as follows. Section 2 recounted some related work; section 3 elucidates the



proposed framework, identifying the important factors and their association with the hypermarket; section 4 describes the experimental process and results. Some important points, final thoughts, and future work are discussed in the Discussion and Conclusion Section.

RELATED WORKS

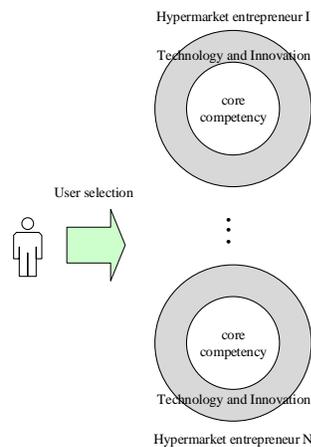
A common practice in innovation management, service quality, and effective operation research often represents the objective function in terms of dependent variables. Aujirapongpan, Vadhanasindhu, Chandrachai and Cooperat (2010) found that operation innovation could be classified into two types, namely, technological innovation and administrative innovation. Tsai, Huang, Jaw, and Chen, (2006) found a positive effect on the relationship between service quality and marketing which, in turn, was conducive toward business success. Voon (2006) showed that service quality influenced customer’s satisfaction and loyalty. Business had to maintain high service quality to keep their customer base running. Ciancutti and Steding (2001) contended that trust was an important attribute of the organization as it not only gave rise to competitive advantage, but also could not be imitated. Wangenheim and Bayon (2004) found that behavioral decision such as risk and referral traits potentially affected the consumer’s intention to purchase. Kozikowski (2012) studied customer’s interaction to service quality, referral to high quality, satisfaction, loyalty, perceived value, and trust, and confirmed his hypotheses that (1) service quality and perceived value had positive influences on recommendation, and (2) perceived value and trust had positive influences on loyalty. Kandampully & Suhartanto (2003) and Tanapol (2012) found that aligning satisfaction between seller and buyer would yield service satisfaction that led to a good long-range business planning. Shoki, Ariff, Fen and Ismail (2012) discovered three factors that enhanced purchase behavior of online customer, namely, variety of products (89%), convenience without commuting (80%), and available anywhere and anytime (72%). Hence, hypermarket entrepreneurs had to be well-prepared for such circumstances. Law (2004) studied purchase behavior and discovered that loyalty to branding would foster reapply intention. These a priori works will be further exploited in subsequent analysis.

PROPOSED FRAMEWORK

From the customers’ standpoint, they have abundant choices to select where, when, who to buy, and how much they want to pay. Hypermarket entrepreneurs must prepare their core competency to attract the customers in this fast-paced competitive digital age. Figure 1 depicts a conceptual model of the proposed framework.



Figure 1.
The proposed conceptual model



In this framework, each hypermarket entrepreneur should equip themselves with technology and innovation to enhance their core competency and business potential in order to compete in the digital age. This study will categorize the factors and their supporting variables that influence the accomplishment as follows:

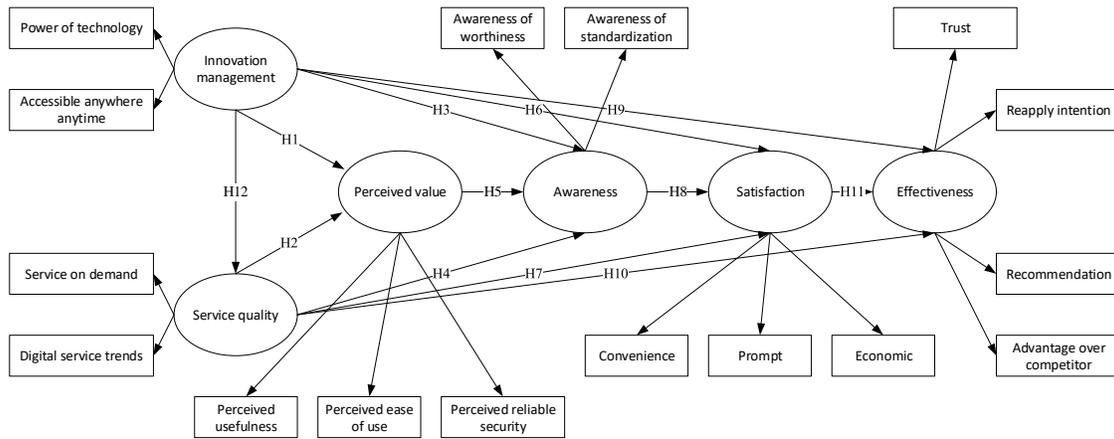
1. Innovation management: Power of Technology, Acceptable Anywhere Anytime.
2. Service quality: Service on Demand, Digital Service Trends.
3. Perceived value: Perceived Usefulness, Perceived Ease of Use, Perceived Reliable Security.
4. Awareness: Awareness of Worthiness, Awareness of Standardization.
5. Satisfaction: Convenience, Prompt, Economic.
6. Effectiveness: Trust, Reapply intention, Recommendation, Advantage over competitor.

In Analysis of the association of these factors is shown in Figure 2. The corresponding hypotheses are set as follows:

- (H1) denotes innovation management positive influence on perceived value,
- (H2) denotes service quality positive influence on perceived value,
- (H3) denotes innovation management positive influence on awareness,
- (H4) denotes service quality positive influence on awareness,
- (H5) denotes perceived value positive influence on awareness,
- (H6) denotes innovation management positive influence on satisfaction,
- (H7) denotes service quality positive influence on satisfaction,
- (H8) denotes awareness positive influence on satisfaction,
- (H9) denotes innovation management positive influence on effectiveness,
- (H10) denotes service quality positive influence on effectiveness,
- (H11) denotes satisfaction positive influence on effectiveness,
- (H12) denotes innovation management positive influence on service quality.



Figure 2.
The association of relating factors to hypermarket



RESULTS

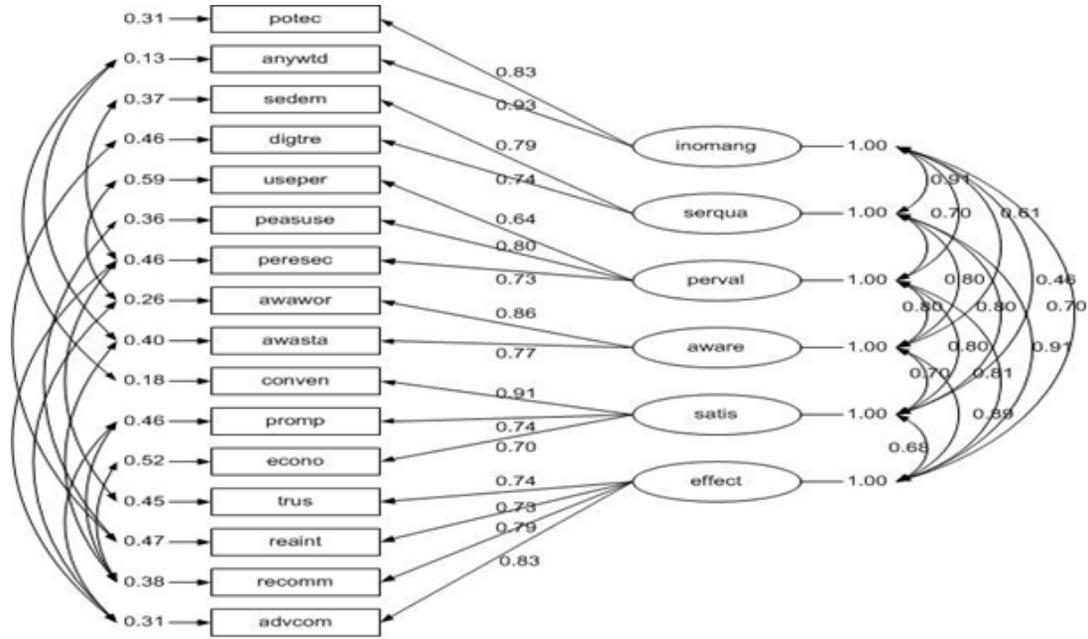
Data of the experiment were collected from questionnaire from 360 customers in several hypermarkets in Bangkok Metropolitan area. They were 27 Big C branches and 21 Tesco Lotus branches. The in-depth interviews on relevant participants were conducted with 5 experts, 5 entrepreneurs, and 7 selected customers. Data were analyzed using descriptive statistics. A number of parameters were inferred, namely, Root Mean Square Error of Approximation (RMSEA), Test of Close Fit, Normed Fit Index (NFI), Incremental Fit Index (IFI), Root Mean Squared Residuals (RMR), Standardized Root Mean Square Residual (SRMR), the chi-square (χ^2) likelihood ratio, and other pertinent statistics are depicted in Figure 3. Estimation results of dependent and independent variables are shown in Table 1.



Figure 3.

Analysis of confirmation factors from SEM using LISREL (n = 360)

$\chi^2 = 126.56$, $df = 72$ p-value = 0.00008, $\chi^2 / df = 1.75$, RMSEA = 0.046, P-Value for Test of Close Fit = 0.068, NFI = 0.99, IFI = 0.99, RMR = 0.014, SRMR = 0.034, CFI = 0.99, GFI = 0.96, AGFI = 0.92, CN = 292.70



Chi-Square=126.56, df=72, P-value=0.00008, RMSEA=0.046



Table 1.
Results of parameter estimation of indep and dep variables (n=360)

indep. variable \ dep. variable	R ²	Service quality (serqua)	Perceived value (perval)	Awareness (aware)	Satisfaction (satis)	Innovation management (inomang)
Service quality (serqua)	.89	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	.94*(16.94) n/a .94*(16.94)
Perceived value (perval)	.67	.63*(4.94) n/a .63*(4.94)	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	.93*(2.90) .04*(4.69) .97*(8.75)
Awareness (aware)	.99	.60*(4.18) .35*(3.00) .95*(6.95)	.40*(2.59) n/a .40*(2.59)	n/a n/a n/a	n/a n/a n/a	.14*(3.81) .47*(5.65) .61*(10.51)
Satisfaction (satis)	.91	.56*(1.98) .38*(2.19) .94*(2.83)	n/a .18*(5.44) .18*(5.44)	.94*(2.61) n/a .94*(2.61)	n/a n/a n/a	.90*(1.94) .05*(1.71) .95*(7.68)
Effectiveness (effect)	.90	.87*(6.12) .06*(0.67) .93*(6.94)	n/a .07*(0.57) .07*(0.57)	n/a .16*(0.63) .16*(0.63)	.06*(0.57) n/a .06*(0.57)	.08*(3.98) .62*(6.18) .70*(11.40)

where * denotes sig. = 0.05, () denotes the t-test score. If the value does not lie within -1.96 to 1.96, the result is statistically significant at 0.05 level. The results obtained can be summarized as follows:

1. Likelihood Ratio Chi-Square χ^2 in comparison with the Competing Models ≥ 0.05
2. Relative Chi-Square χ^2/df verification of model consistency ≤ 2.00
3. Root Mean Square Error of Approximation (RMSEA) of the model ≤ 0.05
4. P-Value for Test of Close Fit, $p \geq 0.05$
5. Normed Fit Index (NFI) ≥ 0.90
6. Incremental Fit Index (IFI) ≥ 0.90
7. Root Mean Squared Residuals (RMR) ≤ 0.05
8. Standardized Root Mean Square Residual (SRMR) ≤ 0.05
9. Comparative Fit Index (CFI) ≥ 0.90
10. Goodness of Fix Index (GFI) ≥ 0.90
11. Adjusted Goodness of Fix Index (AGFI) ≥ 0.90
12. Critical sample size N (CN) ≥ 200

The resulting distribution contains the followings: root mean square error of approximation (RMSEA) ≤ 0.05 , p-value for test of close fit ≥ 0.05 , and normal fit index (NFI) ≥ 0.90 . This means that all hypotheses are valid based on normal χ^2 .



CONCLUSION AND FUTURE WORK

The results confirmed that hypotheses on factors pertinent to enhancing the effectiveness of smart hypermarket in the digital age influenced directly to the business administration. Based on the above hypotheses, we can infer as follows:

1. Innovation management had a positive coefficient of 0.93 with perceived value at 0.05 significant level;
2. Innovation management had a positive coefficient of 0.14 with awareness at 0.05 significant level;
3. Service quality had a positive coefficient of 0.63 with perceived value at 0.05 significant level;
4. Service quality had a positive coefficient of 0.60 with awareness at 0.05 significant level;
5. Perceive value had a positive coefficient of 0.60 with awareness at 0.05 significant level;
6. Innovation management had no influence on satisfaction;
7. Service quality had a positive coefficient of 0.56 with satisfaction at 0.05 significant level;
8. Awareness had a positive coefficient of 0.94 with satisfaction at 0.05 significant level;
9. Innovation management had a positive coefficient of 0.08 with effectiveness at 0.05 significant level;
10. Service quality had a positive coefficient of 0.87 with effectiveness at 0.05 significant level;
11. Satisfaction had no influence on effectiveness;
12. Innovation management had a positive coefficient of 0.94 with effectiveness at 0.05 significant level.

There were only H6 and H11 having no influence on the relating factors.

Entrepreneurs must be attentive to exploit the results of this study on enhancing their hypermarket administration over the competitors. For instance, since convenience has higher influence on satisfaction than prompt or economy, they must spend more effort to improve convenience for customers. This will indirectly create customer satisfaction which could eventually turn into customer loyalty.

One of the important works the entrepreneurs should focus on is the qualitative impacts of these factors on consumers' psychology and behavior such that appropriate innovation management techniques can be introduced to enhance the effectiveness of hypermarket in the digital age.

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Cultural Community-Based Tourism: A Case Study of Ngao Community, Mueang District, Ranong Province, Thailand

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ABSTRACT

In the rural areas, cultural tourism programs (CTPs) provide opportunities for local communities to augment their income. These programs are intended to empower local people and reduce poverty, while villagers do not have to change their way of life. Local culture is not only appreciated as a tourism attraction, but also a resource upon which community-based tourism development can be built. The three pillars of sustainability, which are consist of the economic, social, and environmental pillars, are a powerful tool for defining the complete sustainability problem. If any pillar is weak then the system as a whole is unsustainable. This study aimed to study the community’s context and evaluate attraction site in Ngao Community, Mueang District, Ranong Province, Thailand as a cultural attraction for sustainable tourism. Data was collected from 3 government officials, 2 business people and 3 local people (8 people in total) and using in-depth interviews. It showed that the participation of community people plays the important role for development of cultural tourism management to become sustainable. The government also needs to continue supporting these initiatives at all levels, to coach how to start a CTPs Startup and to improve the existing ones.

Keywords: *Community-based tourism, Cultural tourism, Sustainability*

INTRODUCTION

Due to the fact that Thai’s government wants to boost confidence for tourists and promote tourism competitiveness in order to create a stable and healthy economy. Tourism becomes a service industry that plays a key role in boosting the country's economy and is extremely valuable. In addition to being the main source of income in the country, it is also the source of other related businesses and to distribute income to society. Sustainable tourism development is in line with current Thai environment and society (Lee & O’Neil, 2004). The three pillars of sustainability, which are consist of the economic, social, and environmental pillars, are a powerful tool for defining the complete sustainability problem. If any pillar is weak then the system as a whole is unsustainable. While cultural tourism programs (CTPs) are developed to provide opportunities for local communities, especially in the rural areas. They are intended to empower local people and reduce poverty, the mechanisms used for choosing the targeted ‘communities’ remain largely unexamined (Mgonja, Sirima, Backman & Backman, 2015). Culture is the social behaviors and norms found in human societies. Culture is considered a central concept in anthropology encompassing the range of phenomena that are transmitted through social learning in human societies. Culture is a way of life. It comprises of language, religion and specific lifestyles. Local culture is not only appreciated as a tourism attraction, but also a resource upon which



Community-Based Tourism development can be built. Tourism must be developed to be more valuable and meaningful than the current popular mainstream tourism. All sectors related to tourism development must have a "new awareness" which is called "development of sufficiency tourism" and the context of development to cover a wide range of dimensions, based on the growing complexity of Thai society and the world community (Tantivejaku, 2006). It is thus a community asset used for the tourist product, which creates the assumption that cultural authenticity is awaiting the tourist throughout the stay in the community.

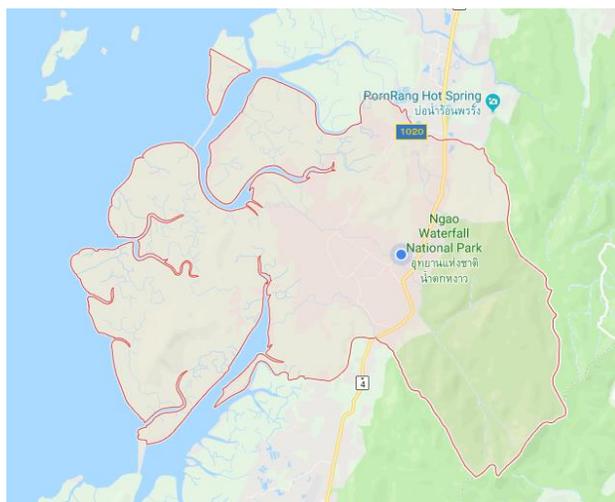
In the year 2017, the total contribution of Travel & Tourism to GDP was THB3,229.8bn (USD95.0bn), 21.2% of GDP in 2017, and is forecast to rise by 7.4% in 2018, and to rise by 5.6% per annum to THB5,957.1bn (USD175.2bn), 28.2% of GDP in 2028. Travel & Tourism directly supported 2,336,500 jobs (6.2% of total employment). This is expected to rise by 5.2% in 2018 and rise by 4.0% per annum to 3,628,000 jobs (9.4% of total employment) in 2028 (World Travel and Tourism Council, 2018). According to the tourism marketing database from the Ministry of Tourism and Sports, on the report of the number of visitor statistics and estimated revenue from tourism in Ranong Province shows that in the year 2016, the number of visitor was 742,126 tourists with estimated revenue of THB 3,726.70m (USD113.54m). In 2017, there were 775,220 tourists, with estimated revenue of THB3,977.80m (USD121.21m) (Ministry of Tourism and Sports, 2017). From this data, it illustrates the trend growth of the economy and the opportunity that tourism business will expand in the future to meet the needs of tourists and bring visitors' satisfaction on re-visiting intention.

Ranong is a southern coastal province located along the Andaman Sea or the Indian Ocean. It is divided into 5 districts, 30 sub-districts and 178 villages. The district or called in Thai “Amphoe” is subdivided into 5 districts, namely, Mueang, La-un, Kapoe, Kra Buri, and Suk Samran. Ranong is the least populated province, eighty percent of its area is covered by forests, and 67 percent is mountainous. There are many biodiversity of ecosystems and regions. Mangrove forest is very rich where has been declared a World Biosphere Reserve Zone by UNESCO. An ancient city with a long history belongs to both national and international identity where a source of tradition and historical attractions is. An outstanding potential resource is Natural hot mineral water with world class quality. In former years the major industry was tin mining, but most mines are now exhausted. White clay mining (for the production of porcelain) and fishing are now the main industries, along with rubber and cashew nuts (Provincial Development Strategy Group, n.d.). In the Mueang district there is an old community that has a distinctive cultural attraction named Ngao. It was settled from the migration of villagers from many places. There is included a group of Chinese Hokkien workers from Phuket who came to work in the mining industry, partially raising cattle on the hillside. They called wild cattle in Chinese Hokkien "Ngow," then villagers and later generations called “Ngao” and they called this village "Baan Ngao". Baan Ngao is a pleasant village where is surrounded by beautiful nature. As the growth of the mining business changed the villager's lives, therefore the commercial and business areas were rising. Soon Ngao village became a Tambon or sub-district and was subdivided into 5 villages. Occupations of the residents are fishermen, merchants and laborers (Ngao's Subdistrict Municipality, 2018).



Figure 1.

Ngao sub-district, Mueang District, Ranong Province, Thailand (source: <https://www.wikipedia.com>)



The objective of this study was to identify context and evaluate attraction site and to find out what are problems and obstacles of cultural tourism management by people in Ngao Community, Mueang District, Ranong Province, Thailand. So that the Ngao community can develop into a unique cultural attraction while improving the residents’ quality of life and strengthen the community to be a cultural attraction and lead to sustainable tourism development.

LITERATURE & THEORY

Tourism is the journey of a person from one place to another to rest or business contact with a different purpose (Pimolsomphong, 2007). Tourism is a service industry that plays a key role in promoting the country's economy and the created more values. In addition, to being the main source of income in the country, it is also the source of other related businesses and distributes income to society. Businesses in the service industry are different from the general consumer goods industry. The products and services offered directly to customers or the market are both tangible and intangible product. However tourism products are intangibility, inseparability and variability and cannot be maintained (Kotler, Bowen, & Makens, 2010) . Tourists were part of the locals’ everyday life to a certain extent makes it hard to decide whether they actually gained access to the back – the ‘real’ area – or whether their experiences were part of staged activities – a simple job performed weekly (Dolezal, & Claudia, 2011). Cohen (1988) argues that tourists are being deluded as to the authentic nature of their experiences, which are in fact staged events (Cohen, 1988). If this were true, would this assumption mean anything negative for either the guest or the tourist? It should not be forgotten that the fact of presenting the front and a staged life could even help to keep traditions alive while maintaining privacy for local people (Stanton, 1989).

Tourism Authority of Thailand (2002) has defined the cultural attractions is a place where the art and traditions of the ancestors have been created and passed on as inheritance. This type of tourism consists of traditions, life styles, cultural shows, indigenous products, clothing, languages, races, etc. (Tourism Authority of Thailand, 2002). Cultural Based Tourism (CBT) is a beneficial form of tourism, given it is planned carefully



and its implementation complies with the operational definition. Also, it leaves tourists with an extraordinary Thai experience, a precondition for mutual understanding and sensitization. It even stages activities more subtle than conventional tourism does, which mostly satisfies the authenticity seeking tourist (Maoz, 2006). Then the way CBT is organized can help strengthen culture and traditions (Telfer & Sharpley, 2008).

Sustainable Tourism is a large and well-managed tour group that can sustain unrivaled tourism resources. The tourism industry has been improving the quality of its products for a fair profit. Local community participation is rewarded appropriately. The tourists are visiting regularly enough whilst it has the slightest or no negative impact on the environment (Jittangwatana, 2007). Sustainable tourism management for the distribution of benefits and have positive impact on society, economy and environment. In marketing, all stakeholders have to work together to create value and realized that each attraction is different and unique. Finding a strong brand identity is the beginning of sustainable branding because the difference must be built from inside (Juthamas, 2015). Concepts for sustainable tourism development are a tourism that responds to the needs of tourists and their owners, with a focus on natural resources management and to be able to maintain the stability of the ecosystem as well as the culture and way of life of the community for the benefit of both present and future (World Tourism Organization, 1998). There are five main factors: the conservation of tourism resources, planning and management in tourism development, maintaining the quality of the environment in tourist attractions, to maintain the level of tourist satisfaction, and tourism management is distributed in all sectors (Ngamyinyong & Silanoi, 2017).

Sakarin (2017) was studied about community based tourism in sustainable dimension, case study: Baan Muanggluang Community Kaper District, Ranong Province. This research was aimed to study the guideline of sustainable tourism development context on a small community in Ranong Province in order to let community be able to solve problems by their own with efficiency about sustainable tourism development in the community. This can be defined as “the Community based tourism” which is local people in community do performance with solid work to find solution on how to make progress on tourism in the community. The finding found that participation is one of the key success factors in tourism development, but is practically hard to achieve especially in the context of developing countries such as Thailand due to several reasons (Sriupayo, 2017).

Chontinee (2017) was studied and found something interesting about the guideline in the cultural tourism route development in community of Ngao District, Amphur Muang, Ranong Province. Most tourists came to visit Ngao community for pay homage to the Tin Buddha image at Baan Ngao temple. At the end of Buddhist lent day festival (the 15th day of the waxing moon on the 11th lunar month,) tourist attended a ceremony for offering food to monks (Tak Bat Thewo) and listen to the sermon. For the facilities and infrastructures, there were adequate parking, electricity supply, shops, seating areas and security. However, there were not enough public toilets when many tourists came. Documents and guides that can provide tourist information about this area were less. Most of them were traveled by car because there are a few public bus lines that could access to this side and not well known by tourists (Yookong, 2017).

DISCUSSION METHODS

For the data collection, both primary and secondary data were used. In this research, the primary data was collected in-depth interviews, semi-structured method using, with open end questions and observed from the site inspection around Ngao Community, Mueang District, Ranong Province. The secondary data found from the press news, books and any related articles and journals on cultural and community bases tourism management.



The purpose was to study on perception of tourism providers only. Data were collected from 3 government officials, 2 business people and 3 local people (8 people in total). Key opponents were asked questions regarding their opinions of current situation of cultural tourism in Ngao Community, Ranong Province, Thailand.

RESULTS

Ngao has a unique tradition rich in natural resources both in water and on land. Due to the migration of villagers from many places during tin mining industry period and Ranong is Thai-Myanmar border, so there were many races of people who are living here and cause of cultural diversity. However, the outstanding culture is mixing between Thai, Chinese and Muslim. Cultures in Ngao Community are expressed in the form of language, dress and food. Here, Chinese words were spoken together with the Sothern’s dialect of the villagers because Ngao is the residence of the Chinese people since the pioneering era.

Figure 2.
Ubosot of Baan Ngao Temple, Ranong Province, Thailand



There are many tourist attractions in this area such as Ngao Waterfall National Park, Grass Mountain, Ngao Mangrove Forest Research Centre, Crocodiles farm. Wat Baan Ngao is also a major tourist attraction and is one of the famous temples of Ranong where has the largest tin Buddha in the world with the gesture of Subduing Mara. Because the temple is a setting of a local museum where displayed the collection of appliances that has been used by locals when there was tin mining industry and any items from the past to present era that has been found. Inside the temple area, people can feed many kinds of freshwater fish in a pond. Besides, there are more than 300 concrete steps ladder that can be climb up to the top of the mountain to see the panoramic landscape of Ranong province. So the temple has been developed as a cultural attraction.

Figure 3.
Atmosphere of Ngao Walking Street, Ranong Province, Thailand





At the market, there are varieties of traditional Ranong’s food and snacks were sold, for example Hajee (deep fried mixed vegetables with seafood), A-pong (coconut pancake), Yao-ye (mixed vegetables salad with tofu and seafood in Hokkien’s style), Lor-gor-york (papaya salad with shrimp paste) and so on. Ngao walking street was organized since 2016 by cohesion among local government sectors, business sectors and people in the community. They claimed that it was a kind of cultural flea market. The purpose of organizing this market was to increase numbers of tourists visiting the area by using the uniqueness of local’s food to attract tourists.

Figure 4.

Yao-ye (mixed vegetables salad with tofu and seafood in Hokkien’s style)



Figure 5.

Lor-gor-york (papaya salad with shrimp paste)





Table 1.
The SWOT analysis of Ngao Community, Mueang District, Ranong Province, Thailand as a tourist cultural attraction

Strengths	Weaknesses
<ul style="list-style-type: none"> - Location is not far from the central of the city. - Many famous tourist attractions nearby. - Utilities are well provided. - Many shops and restaurants are available. - Local foods and local products have good taste, good quality with the cheap price. 	<ul style="list-style-type: none"> - Public transportation is inadequate - Limited number of accommodation in the area provided for tourists - There are not enough local guides - Lack of marketing and publicity.
Opportunities	Threats
<ul style="list-style-type: none"> - Government’s project that support the tourism. - Increasing number of tourists visiting Ranong Province. 	<ul style="list-style-type: none"> - Long period of rainy season. - High competitiveness into many areas in the province.

From table 1, The SWOT analysis of Ngao Community, Mueang District, Ranong Province, Thailand as a tourist cultural attraction. Strengths of Ngao Community are its location is not far from the central of the city so that tourists could visit and there are many famous tourist attractions nearby such as the Porn Rung Hot Springs, Ngao Waterfall, Grass Mountain also there is a pier where tourist could connect to the islands. Due to Ngao is not far from the city, so there is no problem about utilities and internet network is covered this area. There are many shops and restaurant in the area, however, most shops are in small size and sometimes they couldn’t provide for high volume of tourists’ demand. Local foods and local products here also have good taste, good quality with the cheap price.

Weaknesses, though Ngao is close to Ranong town but public transportation is inadequate. There are 2 lines of local bus (Rot Song Taew) that passengers-side made of wood and they run daily schedule during daytime (approximately every 1 hour). There is a few of small resorts and homestay in the area so it is not possible to support for a big group of tourists if they want to stay. There are not enough local guides to provide the information in the area. Because Ngao is lack of marketing channel and publicity so some tourists are not recognized that where they should go to visit and see.

Opportunities, thanks to many of government’s projects that support the tourism in the country because they see that tourism business could create more jobs and generate income in the country. And now government tried to promote tourist attractions in Ranong through many media channels, it, therefore, is increasing number of tourists visiting Ranong Province.

Threats, due to Ranong has rainy season for about 8 months, so there are low number of tourists in those periods. As the government support local communities to start tourism route for in the selected villages, therefore, the number of competitiveness are high into many areas in the province.



CONCLUSION

The objective of this study was to identify context and evaluate attraction site and to find out what are problems and obstacles of cultural tourism management by people in Ngao Community, Mueang District, Ranong Province, Thailand analyzed by using SWOT strategy. The purpose was to study on perception of tourism providers. It shows that Ngao Community has potential to develop its location to become a cultural tourist destination. The participation of community people plays the important role for development of cultural tourism management to become sustainable. However, the government also needs to continue supporting these initiatives at all levels, to coach how to start a CTPs Startup and to improve the existing ones. So that the Ngao community can develop into a unique cultural attraction while improving the residents' quality of life and strengthen the community to be a cultural attraction and lead to sustainable tourism development.

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The Evaluation of International Freight Forwarders Selection Criteria for Shipper in Thailand

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ABSTRACT

The purposes of this research were to identify factors of freight forwarder quality’s services, and to study how shipper’s selection affects freight forwarder services. This research consisted of seven subordinate objectives including 1) to study freight forwarder selection criteria related to six dimensions of SERVQUAL evaluation; 2) to study customers’ satisfaction in overall price and service evaluated for freight forwarders selection criteria; 3)to explore the important level on six dimensions of SERVQUAL which are an analysis of services decision making; 4) to explore the level of importance on overall customer’s satisfaction; 5) to identify the relationship between perceived service under key services quality attributes of shippers and 7Ps evidence in marketing affect customer satisfaction; 6) to identify the relationship between expected service factors(7Ps) and W.O.M. affecting six dimensions of SERVQUAL; and 7) to study the differece of demographic of shipper perspectives.

The conceptual framework in this research was developed from SERQUAL, marketing mix for finding the results of selection criteria for international freight forwarders and relational performance on customer satisfaction as well as loyalty in Business to Business (B2B). The rapid increase amount of importing and exporting business in Thailand made IFFs industry grow up in 3PLs logistics market. This research focused on how to develop marketing strategies in competitive market.

Keywords: *Freight Forwarders, Selection Criteria, Decision Making, Customer Satisfaction, 3PLs*

INTRODUCTION

This paper aims to indicate the rapid expansion of Thailand’s economic becoming a large part exporting countries sectors on logistics activities, especially, Third Party Logistics (3PLs) which play an important role in supporting export and import activities. Consequently, freight forwarding industries in Thailand is the way of high competition in the market. The 3PLs managements are not only ways to cost saving, but also enhance competitive advantage provided variety of service’s functions.

Thus, this research examines to identify selection criteria and evaluation on final decision making of customer satisfaction among shipper in Thailand. The strong freight forwarding industry is imperative if the country is to capitalize on emerging opportunities as well as enhancing the efficiency of vulnerable industries. The increasing complexity of global trade practices comprising multi-modal transportation, cargo consolidation at regional hubs, distribution at destinations and multiple documentation have increased the importance of intermediaries providing logistics solution.

In addition, freight forwarders assist exporters in preparing price quotations by advising on freight costs, port charges, consular fees, costs of special documentation, insurance costs and their handling fees. Moreover, they also recommend the packing methods which reserve the necessary space on a vessel, aircraft, train, or truck. The cost for their services is a legitimate export cost that should be included in the price charged to the customer (Vishwash, 2007).



Table 1: Number of International trade Value (Import and Export value) 2010-2015.

Year	Export (Million Baht)	Import (Million Baht)
2011	6,707,988.27	6,982,719.15
2012	7,078,420.21	7,786,132.18
2013	6,909,741.17	7,657,345.59
2014	7,313,066.40	7,403,898.06
2015	7,227,160.85	6,906,078.41

Source: Thai Customs Department, 2016

Thai Customs Department, 2011-2015 has shown the record that Thailand has been increasing a number of import and export products quantity as well as shippers and consignees firms into international traders in the market, nowadays.

International trading process has many logistics activities and supply chain; therefore, it is not surprise if Thailand has been going to be a large number of IFFs firms in 3PLs market.

Statement of Problems:

As above introduction refers to transportation or 3PLs business has been increasing and enhancing competitive advantage. Therefore, decision making of their customer is very important to make more understanding as it can refer to measurement of customer satisfaction (Pizam, Neumann, & Reichel, 1978). In addition, among international trade companies, customer decision making on selecting freight forwarder company is very important due to the fact that the import-export processing has a complicated process, and needs connective performance (Murphy & Daley, 2001). The problem can occur at all time, so they need to have any firm who can provide high quality service, and perform as a working professional. Thus, this problem is how classified the best of Freight Forwarder Selection Criteria measure customer satisfaction and customer expectation among shippers perspective. As a result, if international freight forwarders fully understand the needs of shippers or customer satisfaction, they would be in better position market share and right position to satisfy the increasingly competitive market (TIFFA, 2010).

LITERATURE REVIEW

In this part, there are 6 sections on internal trade business and the factors are included which are: international freight forwarding industries, selection criteria, SERVQUAL 6 dimensions, customer satisfaction, expected service and perceived service. According to the basic concept of logistics collaboration and definitions of measurement relevant to orchids supply chain in Thailand, the logistics collaboration includes demand forecasting, inventory management, warehouse and storage, order processing as well as transportation management. There are several activities that stake holders can collaborate and develop in business from upstream to downstream. (Hotrawaisaya, 2014). Vishwash(2007) indicates the role of freight forwarder in the execution of export that a freight forwarder is a third party logistics provider. As a third party provider is a forwarder that dispatches shipments via asset-based carriers and books or otherwise arranges space for those shipments. Carrier types include waterborne vessels, airplanes, trucks or railroads. Freight forwarders typically arrange cargo movement to an international destination, and also refer to IFFs. They have the expertise that allows them to prepare and process the documentation and perform related activities pertaining to international shipments. Some of the typical information reviewed by a freight forwarder is the commercial invoice, shipper’s export declaration, bill of landing and other documents required by the carrier or country of export, import or transshipment. Kannan, Bose and Kannan (2011) study on an evaluation of ocean container carrier selection criteria in case of an Indian shipper’s perspective, and indicated that there were several criterion modes, such as freight charges, transit time, SERVQUAL, and customer satisfaction. SERVQUAL (Parasuraman et al., 1988) is the most popular service quality measurement. Basically, carrier selection studies shall be

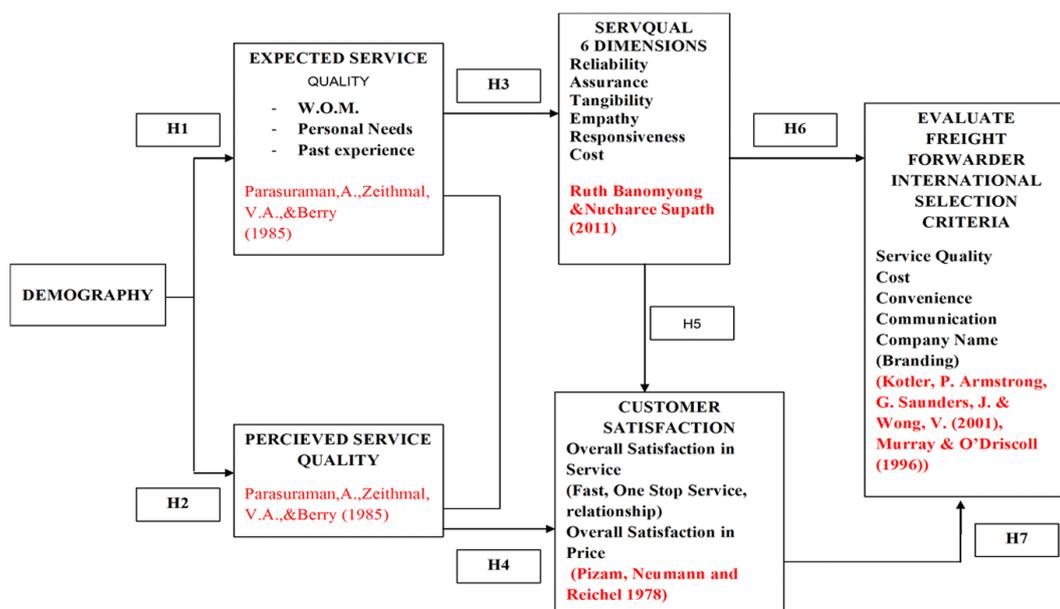


classified into three categories including viz., shipper-only studies, carrier versus shipper studies and carrier versus export & import shipper studies. Shipper-only studies are uni-dimensional studies which study the perceived importance of selection criteria only from shippers’ perspective. In addition, carrier versus shipper studies are bi-dimensional studies which study the perceptual difference of various criteria between carriers and shippers. Nyeck, Morales, Ladhari and Pons, (2002) state that the SERVQUAL is a measuring tool “remains the most completes attempt to conceptualize and measure service quality”, and also defined “main benefit to the SERVQUAL measuring tool is the ability of researchers to examine numerous services industries such as healthcare, banking, financial services, and education”. Focusing on transportation industry, SERVQUAL is measurement service quality is the result of the discrepancy between customer’s expectations on services and their perceptions actually received (Yousapronpaiboon, 2002). The theoretical foundations, in early 1980s to 1990s had several studied disaffirmation paradigm related to discrepancies between prior expectation and actual perceptions of performance service quality future more (Parasuraman, Zeithaml, & Berry, 1994; 1998).

METHODOLOGY

The methodology of this paper could be separated into 2 parts including: For the first part, the conceptual framework was developed as presented in the Figure 1 in order to determine whether international freight forwarders services attributes. The conceptual framework of this study was to identify how to measure in order to understand customers’ requirement and expectation of service quality and related firms whether they could implement and develop to CRM, as well as build loyalty of customer base on customer satisfaction in term of quality and price available. Moreover, it was developed to investigate whether 3PLs business could create the competitive advantage strategy by using the information from this research as the benefit.

Figure 1 : Conceptual Framework





Hypotheses are based on the theories discussion in related on this research articles.

(H1): Expected Service Quality is dependent on firm demographic.

(H2): Perceived Service Quality is dependent on firm demographic.

(H3): There is significant relationship between Expected Service Quality and SERVQUAL 6 dimensions.

(H4): There is significant relationship between Perceived Service Quality and Customer Satisfaction.

(H5): There is significant relationship between Customer Satisfaction and SERVQUAL 6 dimensions.

(H6): There is significant relationship between Evaluate Freight Forwarder International Selection Criteria and SERVQUAL 6 dimensions.

(H7): There is significant relationship between Evaluate Freight Forwarder International Selection Criteria and Customer Satisfaction.

The second part of methodology was collection tools for conducting survey by using a questionnaire which was developed base on relevant to the objectives and conceptual framework of this study by separating to 6 divided parts. The results of analysis from primary research by using questionnaires to be a tool of the data collection method was conducted on the total sample size in this study consisting of 400 shipper companies in Thailand including importer and exporter firms. In addition, the questionnaires were designed appropriately to respondents who had decision making power or authority to select 3PL provider services. The data analysis was presented in five sections including: demographic of the respondents on level of important and level of satisfaction, the results of statistical analysis for expected service quality and perceived service are dependent on demographic, regression analysis, the result of statistical analysis for expected service quality are dependent on SERVQUAL included between perceived service quality and customer satisfaction and regression analysis, the results of statistical analysis for evaluation freight forwarder international selection criteria are dependent on SERVQUAL and customer satisfaction.

CONCLUSION AND RECOMMENDATIONS

This study demonstrated the level of importance and level of satisfaction of the respondents. The results of statistic for expected service quality and perceived service and firm demographic. The analysis showed a relationship between expected service quality and SERVQUAL. Also, the analysis elucidated a relationship between perceived service quality and overall customer satisfaction.

Firm Demographic: This study found that all firm demographics, which are department of international trading, position level, number of employees in company, number of countries, are international trading and types of manufacturing are related to expected service quality. While only two characteristics which are department of international trading, and number of countries are international trading that are related to perceived service quality.

Expected Service Quality: This study found that the expected service quality concerned service, price, place, promotion, process, people, physical evidence and word or mouth had the relationship with all factors in SERVQUAL which are reliability, assurance, tangibility, empathy, responsiveness and cost.

Perceived Service Quality: The study found that perceived service quality concern service, price, place, promotion, process, people and physical evidence has no significant relationship with customer satisfaction.



SERVQUAL 6 dimensions and Customer Satisfaction: This study explored that SERVQUAL 6 dimensions that reliability, assurance, tangibility, empathy, responsiveness and cost had the relationship with customer satisfaction.

Evaluate Freight Forwarder International Selection Criteria: This study found that the evaluation demonstrated that the freight forwarder international selection criteria which were service quality, cost, convenience, communication and company name / loyalty has a relationship with SERVQUAL 6 dimensions which are reliability, assurance, tangibility, empathy, responsiveness and cost. While only 2 factors which are convenience and communication had the relationship with customer satisfaction which are overall customer satisfaction in service and overall customer satisfaction in price.

RECOMMENDATION

For the international freight forwarders company, the international freight forwarder company should provide the best service (over standard in SERVQUAL) and should provide the quickly response or set up KPI in any matter related matter and solves all customers’ problems also attempt to build customer loyalty among shippers or build good relationships with customer and international freight forwarders should enhance distribute channel for customer convenience purpose.

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Relationship of Marketing Activities and Sustainable Coffee Product of Community Enterprises in Ranong Province

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ABSTRACT

The purpose of this research article was to study marketing factors that affected purchasing decision of coffee product of community enterprises in Ranong province. This study was a quantitative research which utilized a questionnaire as a research instrument. The sample consisted of 400 people who purchased coffee product of community enterprise in Ranong province. The data was analyzed by employing a statistical package and multiple regression analysis. The outcome of this study was the marketing activities guidelines designed to help community and community enterprise products to be more recognizable by customers, and eventually become one important part that urged competitive advantage and sustainability.

Keyword: *Marketing activities, coffee product, community enterprise, Ranong*

INTRODUCTION

The community enterprise is initially arose from the concept of the "Philosophy of Sufficiency Economy" of the King Bhumibol Adulyadej Rama IX of Thailand which such concept were developed steadily and systematically, and finally resulted in the creation of a new economy that was based on a reality of the community. His Majesty the King Rama IX stated that the strong community was like the piles of the building blocks, the solid community made the country survives. In the past, the domestic economy was like a building that constructed with narrow bases and if the bases were not strong enough, the building fell down. Thus, the community enterprise is the key to a solid foundation for the country by stimulating the economy at the grassroots level could strengthen and diversify livelihood opportunities in order to create jobs, generate revenues, reduce public costs of the country and allow people to become more self-reliant. (Tanaisri, 2011).

Ranong is located in the Southern part of Thailand, and is considered as one of an emerging city since it has abundant water resources, famous natural mineral water, strategic location to transport goods abroad, and a peaceful society. The above mentioned reasons make Ranong a new outstanding city.

Furthermore, Ranong is one of the most coffee-farming provinces, and is also one of the world’s coffee planting areas. Farmers have grown 80 percent of Robusta coffee in the country (another 20 percent are Arabica coffee grown in the highlands of northern Thailand). The southern peninsula is geographically and tropically suitable for growing the Robusta coffee because of the equator vicinity so that the coffee plant grows well. Ranong is geographically similar to South America and Africa. The area covers the border part of Burma to the din and the rainforest which counts several hundred thousand of Acres. Most of the coffee farmers are Isan people migrating to work in the coffee plantations in the south while the Southern people become a capitalist. (Future Urban Development, Rangsit University, 2016)

The study of related research found that coffee community enterprise in Ranong has been able to sell coffee about ten tons per year. It is sold as raw material for the factory to be processed into ready-to-drink coffee and feed it into the city with both domestic and foreign markets. However, when there is a lot of demand, the competition become more intense while the world economic has continually slumped. Also, the farmers lack of knowledge and understanding in marketing planning. The mentioned causes have forced the coffee community enterprises to meet new challenges and in order to draw consumers’ attention; they



need to adjust their own marketing plan. This research focuses on the marketing factors that are appealing to coffee consumers in Ranong in order to promote the community products to be able to survive sustainably and to increase the capability and competitiveness in the domestic market and the world market.

RESEARCH METHODOLOGY

Objective

To study relationship of marketing factors and purchasing decision of coffee product of community enterprises in Ranong province

Population and Sampling Procedures

The studied population was general customers whose ages are more than 15 years old who used to purchase coffee product of community enterprises in Ranong province for the retail purpose only.

Since the population was unable to identify in exact number, the researchers then utilized the formula of W.G. Cochran and set the confidence level at 95 and the statistical significance level of 0.05. The number of sample got from the formula was 385 samples. However, to prevent incomplete questionnaire, the researchers added 4percent of the sample size for this reason which equaled to 15 respondents. In total, sample size in this study was 400 people. Then, the researcher utilized a convenience sampling method.

Research Instruments

A questionnaire was used as a research instrument for this study. The researchers applied undisguised-structured questionnaire in order to achieve the objectives of this study. The questionnaire comprised by three main sections included questions that identify individual information, questions about the marketing factors and questions about the coffee purchasing behavior. The first section concentrated on generating a demographic profile of the respondents. The second section focused about the marketing factors. The third section determined customer’s opinions towards coffee purchasing decision.

Data Collection

The data were distributed and collected using the questionnaire. By the time of distributing the questionnaire, the researchers prepared a brief explanation of the study to the researcher team. The questionnaire was hand-delivered by the researchers and the teams and waited until the respondents answered all the questions. In order to minimize possible bias, it was communicated to participants that their opinions were voluntary and anonymous and they were encouraged to state their own personal opinion as truthfully as possible while the data would strictly use in academic purposes only. As a result, 400 completed questionnaires were retained and used for subsequent data analysis.

Data Analysis and Interpretation

The authors determined the class interval in order to apply for an interpretation using the following formula

$$\begin{aligned} \text{Class interval} &= \frac{\text{Highest Value} - \text{Lowest Value}}{\text{Number of classes}} \\ &= \frac{5-1}{5} \\ &= 0.8 \end{aligned}$$

Class interval	Interpretation
4.21 - 5.00	highest level of opinion
3.41 - 4.20	high level of opinion
2.61 – 3.40	moderate level of opinion



1.81 – 2.60

low level of opinion

1.00 – 1.80

lowest level of opinion

FINDINGS

After the data obtained from 400 general customers whose ages are more than 15 years old who used to purchase coffee product of community enterprises in Ranong province, Thailand. To examine the research objectives, the survey results showed about marketing factors that affected purchasing decision of coffee product of community enterprises in Ranong province, Thailand.

Data were collected the opinions of respondents towards marketing mix of coffee product of community enterprises in Ranong province in Thailand. The researchers applied rating scale method; the Likert’s scale and then used mean and standard deviation to measure opinion of customers. The details of four dimensions of marketing factors were described in summary as following

Table 1: Summary of Marketing Mix Factors

Marketing Mix Factors	Mean	S.D.	Level of opinion
Product	4.38	0.54	Highest
Price	3.11	0.96	Moderate
Place	3.46	0.74	High
Integrated Marketing Communication	3.24	0.44	Moderate
Average Score	3.58	0.85	High

In conclusion, as shown in Table 1, the overall opinion of general customers towards all four marketing mix factors was at the high level. When considered in detail; the product dimension had the highest level of importance and the place had the high level of importance while 2 marketing dimensions which were the price and the integrated marketing communication factors had the moderate level of importance.

The researchers then tested for multiple regression analysis which table 2 illustrated that the four variables of marketing mix had positive relationship to the purchasing decision of coffee product of community enterprises in Ranong province. When combining the best variables of this set it could be inferred that marketing mix factors had positive effect to the purchasing decision of customers at 76.58 percent at the statistical significance level of 0.05. The degree of importance of each factor could be listed as follows; product ($\beta=0.485$), place ($\beta=0.285$), integrated marketing communication ($\beta=0.264$), and price ($\beta=0.225$).

Table 2: Multiple Regression Analysis

X	B	β	T	sig
Constant	1.569		4.855	0.000
Product (X1)	0.369	0.485	3.598	0.001
Price (X2)	0.245	0.225	4.852	0.000
Place (X3)	0.108	0.285	0.890	0.000



Integrated Marketing Communication (X4)	0.228	0.264	3.589	0.000
$R^2 = 0.589$ $Adjusted\ R^2 = 0.7658$ $P < 0.05$ $F = 86.956$				

DISCUSSION AND CONCLUSION

The findings of this study demonstrated that overall marketing mix factors had positive effect to the purchasing decision of coffee product of community enterprises in Ranong province. The highest importance marketing factor was the product dimension price. It complied with the study of Wassana Suwanvijit and Sompong Pramsaad (2015) who studied about the model of upgrading local southern coffee by geographical indications and noted that robusta-based coffee processing by agricultural groups and community enterprise in Chumphon and Krabi province has a potential to be registered as geographical indication coffee. Each geographical locations of coffee farming are unique, linked with coffee quality and well-known as promising tourist destinations. Furthermore, the results of this study was agreed to the study of Ratirath Na Songkhla and Panida Ninaroon (2016) who found that marketing mix factors had positive effect to the purchasing decision of organic rice and chemical-free vegetables from community enterprise in Nakhonpathom Province.

SUGGESTIONS

In summary, the researchers would like to purpose the marketing activities for coffee product of community enterprises in Ranong province as follows;

1. Reinforce the strengths; product of community enterprises in Ranong province should strengthen their strong points. For example, according to the study, the highest score was the product itself. Thus, the community enterprise should consistently concern about the quality of coffee. Coffee community enterprise should focus on developing processing techniques to ensure the quality of raw material. The team members should also continue learning about new technology of coffee agricultures not only in the production process but also the management in organization.
2. Improve the weaknesses; on the other hand, the entrepreneurs should focus on improving their weak points. For example, according to the study, the least score was the price factor. Thus, coffee community enterprises should study about the spray dry system in order to reduce costs. Moreover, the enterprises should concern about the integrated marketing communication; both online and offline platform in order to increase customer awareness, purchase and re-purchase rate.

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Dip-Slide Technique to Monitor the Water Quality of Cooling Tower in Air Conditioning System to the Building

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ABSTRACT

Current population in Thailand and the tropical countries spend most of the time doing activities (e.g., work, study and even rest) in buildings with air conditioning. There are two main tools including a) Operation of Air Handling Unit and b) Cooling Tower each of equipment which has their own system but relates to cold water with the temperature in range of 8-15 Celcius. Consequently, the disease from cold water can be disseminated into the air-condition system. The large air-conditioning system of the Cooling Tower contains a bacterium called "Legionella" or "Legionare" which causes respiratory disease. If it is serious disease patient may be fatal.

This research aimed to study the utilization of dip-slides technique applied for water quality analysis in cooling water system. The centralized air-conditioning system with case study comparing with laboratory techniques to represent the simply practice in controlling and the laboratory method could be same result; the controlled value. The relation of cold water system and the creation of Pneumonia as part of building syndrome were studied in this research. It is one of the tools to benefit of the management for building management to meet the requirements of the government. The objectives could be divided into 3 points including 1) to study how the Legionella can be existed in the cooling water system, 2) to take the sample by “dip-slides” Techniques as the simple method to compare with laboratory technique, and 3) to provide more factors related to the controlled value for cooling tower for preventing the Legionella exist.

The population to study the sample source in cold water from the centralized air conditioning system, which is the variable are the amount of microorganisms contained. There are two types of testing tools including dip slides and laboratory tests. A simple principle to describe the dip-slides technique is to collect water samples from the test source rinse the water pass through and close immediately cylinder. Dip slides are recommended to monitor common bacterial activity. The test consists of sterile media on plastic containers dipped in liquid to be passed through the liquid. Most dip slides consist of 1 - 2 agars attached to a plastic sheet that resembles jelly. Dip slides are packed in a vacuum tube. Bacteria that are present in the liquid will grow and form a biofilm. The chart for the bacterial count is used to identify the number of bacteria in the test site, ranging from 1,000 to 100,000 CFU per milliliter. If the value exceeds 100,000 CFU to 1,000,000*, it is considered dangerous to respiratory system and forced to close the area and treat the water quickly with face mask working condition. In the same water to test hypothesis Microbial testing by Dipslides technique and by laboratory method. ISO11732 practice practice: 1998 to compare results.



Bacteria and water quality control for central air conditioners. Public buildings can be operated. At present, facility management can use the dip-slides technique to monitor initial water quality and manage buildings using a combination of engineering, science and management that can be used as a baseline assessment and test results.

Keywords: *Dipslides, Legionella, Cooling Tower,*

INTRODUCTION

Current population in Thailand and the tropical countries spend most of the time doing activities in buildings with air conditioning, including work, study and even rest. The hot weather is comfort enhancement. In particular, air conditioning in public buildings is mostly centralized air conditioning. Cold water can be used as a source of cooling to various parts of the building.

a) Operation of Air Handling Unit

The primary principle of air conditioning is the water that has been reduced. Cooling Chiller, which exchange water and heat system, high temperature from the system to the cold and deliver to the Air Handling Unit (AHU) are installed in different areas in the building. Typically, one floor in the building may have more than one set of AHU in the structure of AHU. It looks like a filter panel, and it consists of motors for air generators through the pipelines, where the cold water flows inside the pipeline. The cold air will be blow while lower than outside temperature. Typically, the temperature is 15-21 degrees, then the cool air has passed through the air pipeline distribute via ducting system to the diffuser as an “Supply” in air-con engineering.

When cold airs are sent along the airing duct, the other part is sucked back. In air-con engineering, it is called “Return” By the same fan, it acts as a conduit for higher temperatures through the use of heat sources in areas such as computers, body heat, sports or other activities that cause heat to the surrounding air. The higher temperature is sent to the delivery room and measured. To make the fan rotate faster or slower, the technology called “VSD, the variable speed drive” is used to control the motor speed. According to the difference in temperature in Return air temperature and the water in the pipeline system, it can create the film and the capture of biofilm which is the source and growth of germs, bacteria and viruses in the cold water system. This also causes problems in the delivery process, such as reduction of water flow rates or water has not moved for a long time.

b) Operation of Cooling Tower

When cold water has drawn from the cooling tower to keep the water in cold temperature, Heat Exchangers exchange the heat from cold water will rise to warm water. They will be sent back to the Cooling Tower for injection in upward movement direction of air from the exhaust fan. As a result, warm water transfers heat to the air, and some water will become vapor. This vaporization absorbs heat from the remaining water. It lets the remaining water cool down to cold water, as well as sends to the machine and condenser again. During the warm water is injected into the fray, there will be loss of water from the wind. Drift Losses and Evaporation Losses occur when the Cooling Tower system loses a lot of water. Consequently, the concentration of minerals in the water will be higher. This increase the chance to make more slag, blow down water and make up to reduce the concentration of water in the water.

The large air conditioning system of the Cooling Tower contains a bacterium called "Legionella" or "Legionnaire" which causes respiratory disease. If it is serious disease, patient may be fatal.



OBJECTIVES

1. To study how the Legionella can be existed in the cooling water system
2. To take the sample by “Dip slides” Techniques as the simple method to compare with laboratory technique
3. To provide more factors related to the controlled value for cooling tower for preventing the Legionella exist.

METHODOLOGY

The researcher has studied the basic information by reviewing the literature and research theories, legal information and related research.

The pathogenesis of biofilm and algae will result in reduced heat exchange efficiency and the need to rinse. Cold air tower micro organisms that occur are algae, algae or other plants that naturally occur due to the light and air. Especially, algae will make photosynthesis then release oxygen as a catalyst for more corrosion. And now the germs that the Department of Health announced are a warning for the cooling tower. Legionella *, which is Legionare disease in the lower respiratory tract. In addition, bacteria or microbes, or even algae and moss that occur when some of the dead will fall off and drift into the circulating water pipe. The water circulation and heat transfer are impeded molding. It is caused by the bacteria from the water in the system and the water. Make up as well as the sunshine conditions for the growth of bacteria.



Figure 1. The typical body of Legionella from microscope which infection to reparatory system (Health & Safety Office, 2011)

POPULATION AND TOOLS

The population to study the sample source in cold water from the centralized air-conditioning system is the variables which the amount of microorganisms were contained. There were two types of testing tools including dip slides and laboratory tests. A simple principle to describe the dip-slides technique was used to collect water samples from the test source rinse the water pass through and close immediately cylinder. Finally, the vacuum cylinder shows how much bacteria dissolved in the water containment, in this case is the Cooling Tower.

In order to explain in detailed, the dip-slides technique is a test of the accumulation of microorganisms in liquids. The use of technique is an easy way to measure and observe the behavior of microorganisms. In a liquid-based system, dip slides are often used to detect the presence of Biofilm bacteria in indoor cooling



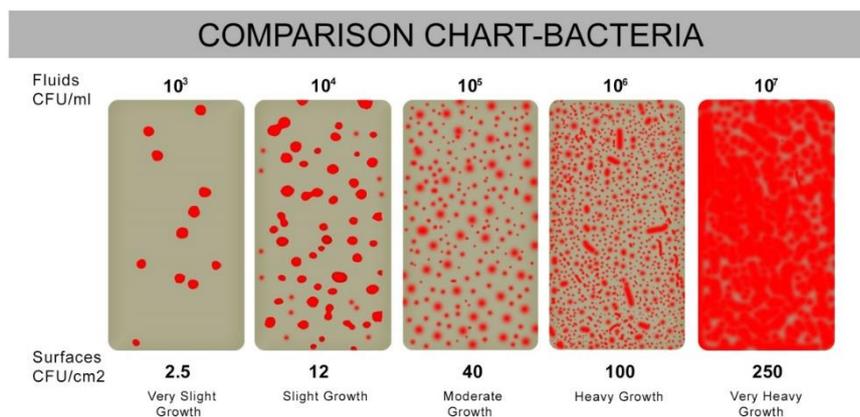
systems. Dip slides are recommended to monitor common bacterial activity. The test consists of sterile media on plastic containers dipped in liquid to be passed through the liquid. Most dip slides consist of 1-2 agars attached to a plastic sheet that resembles jelly. Dip slides are then packed in a vacuum tube as clearly illustrated in the figure 3.



Figure 2. Cylinder for Dip slides Technique (Carlroth, International, n.d.)

In building science, dip slides cylinder will have temperature controlled at 30 Celsius for 48 hours after being dipped in the test water source. After dipping into water, the dip slides are kept under scientific conditions. The test may be conducted in different intervals to increase accuracy. Clear water can also contain bacteria which is can be easily tested. Some water systems are recommended to have weekly tests. For many tests, the temperature control should be control in same range every time. Bacteria that are presented in the liquid will grow and form a biofilm. The chart for the bacterial count is used to identify the number of bacteria in the test site, ranging from 1,000 to 100,000 CFU per milliliter. If the value exceeds 100,000 CFU to 1,000,000*, it is considered dangerous to respiratory system and forced to close the area and treat the water quickly with face mask working condition (Thermo Fisher Scientific Inc., 2017).

Figure 4. Chart to comparing the numbers of bacteria (Dip-slides, n.d.)





As a result of the sampling, it was found that the amount of Legionella was not found in the cooling tower. In addition, the values that should be monitored are the values in Figure 7, which consist of Calcium content in water, water hardness, water magnesium, electricity, chloride, silica, zinc and nitrite. Health and Environmental staff in the building played a major role to take care to any hazardous related to working place. Currently they have been called, HSE (Health Safety and Environment) or SHE (Safety Health and Environment) where were no different meaning in practice.

CONCLUSION

Bacteria and water quality control for central air conditioners in public buildings can be operated. At present, facility management can use the dip slides technique to monitor initial water quality and manage buildings using a combination of engineering, science and management that can be used as a baseline assessment and test results.

ISO11731: 1998 test method can be used again with the corresponding test results. In addition, quality control of raw water entering to the system can prevent slag in the pipe. It requires energy to deliver water to the various stages of the building, and also to maintain good air quality for building users. It is found that this research can continue to operate. The change factor is that the water for a period of time for the Cooling Tower is not used. It is likely that the amount of microorganisms. Used machines all the time

FUTURE WORKS AND SUGGESTION

Sampling of cooling tower and chiller water can be sensitive information to each of the building where the building owner could decline to test and provide the result to the building user. It could be a health insurance to claim in case the Legionella or Legionnaire has passed to the ducting system and to diffuser in working space. To prevent with lower cost, the weekly test of the cooling tower should be conducted during 3 months a time to confirm with laboratory method. The red spot density can represent numbers of the bacteria then cleaning duration to the cooling tower and water treatment to the chiller should be considers upon the results. There shall be more statistics about value in each month of the year under humidity (RH%) record and temperature for both ambient and water itself.

The action after finding the value higher than controlled values are to flood the water in the pipeline, and retest the value once again unless the softening plant or electromagnetic plant to be install along the way of pipeline to feed into machine is part of the choice.

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Evaluation of Thai National Fonts: Using the Empirical Approach

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ABSTRACT

In this paper, the thirteen Thai national fonts were assessed through the short exposure technique and the preference rating. These empirical methods investigated whether type forms affected human vision and recognition. The research procedures started by evaluating confusing letter pairs, and followed by recruiting participants voluntarily online. 403 participants were randomly selected by using the stratified sampling method. Next, the participants were divided into two groups to prevent the order effect. The confusing letter pairs were presented on the computer screen approximately at 50 MS. The participants were asked to name the letters they saw on the screen. After this procedure, the correction rates were compared between the groups. The result from the short exposure technique found that there was no high significance between the fonts. The data from the preference rating also showed a similar trend. Therefore, the results may support the familiarity hypothesis supported by Zuzana Licko (1990), which explains that type forms is less important than the familiarity.

Keywords: *Legibility, Font, Typography*



INTRODUCTION

Psychologists have conducted legibility research since the late 19th Century (e.g. Catell, 1886). In general, the empirical methodology is used to identify factors that affect reading. One of the leading researchers in the field is Miles A. Tinker (1963) who researched this area since the early of the 60s. His research methods are still used by researchers such as Beier (2009) and Chahine (2012). Therefore, the research in the field is still growing based on Tinker’s methods.

In Thailand, there are also few studies on the subject, but the field is mainly dominated by typographers. Hence, the empirical approach is disregarded in the design process. Similarly, today there is little communication between designers and psychologists in the field of type design. This lack leads to a gap of knowledge that needs to be fulfilled by using the empirical approach to assess the quality of Thai fonts.

As a case study, the evaluation of the thirteen national fonts is addressed the need to identify factors that affect reading experience. Although TH Sarabun PSK is the main font that is used in government document since 2010, there is no real evaluation in term of legibility. For this reason, this research aimed to use two empirical methods, preference rating and short exposure technique based on Tinker's methods to assess the quality of the Thai national fonts.

LITERATURE & THEORY

What are the factors that affect legibility of type has been the main discussion among researchers and type designers until today. Whether visibility (i.e., an ability to see the font clearly) or familiarity of a certain type styles influences reading process is an open question. Zuzana Licko (1990) is one of many designers who proposed that familiarity of styles is more important than letter shapes. She addresses that “We read best what we read most.” This suggestion means that even though letterforms are complex, they can be non-problematically read by the person who is familiar with the style and the sentence. Beier (2012) also gives an example of Blackletter used in Germany during the Second World War. In 1941, Nazi declared that Blackletter has an association with Jewish root; therefore, it was replaced with Roman letters. This action leads to confusion among Germans who, during the time, were familiar with Blackletters than Roman letters. However, nowadays, when Roman letters are frequently used in Germany, there is no problem in reading. Therefore, Licko concludes that familiarity can be changed. Hence, reading process may be adapted depending on the familiarity. This hypothesis is coherent with the exposure effect in psychology (Lidwell et al., 2010) which explains a phenomenon that people has a tendency to like something that familiar to them. However, some researchers including Lund [1999] opposes this proposition because it is too obscure. Although Lund does not support Licko’s statement, he does not either agrees with Tinker’s proposition that font design can be assessed through the empirical approach. Lund suggests that tacit knowledge of designers is more important than the results from research in the field of legibility. However, Beier (2009) addresses that there is a gap of knowledge because designers tend to disregard any suggestion from academic research which may improve font quality. In her research, she determines to find whether familiarity or visibility are the factor that influence the legibility of typeface; in addition, she also adopted empirical approach to test her fonts. Beier also bases her methods on Larson’s work (2003) which explains how human can recognize words. There are three models including word shape model, serial letter recognition model and parallel letter recognition. It is believed that the third model is the most plausible model among the three since the brain process is complex and not in order as in word shape model and serial recognition model. In 2012, Chahine also extends the field of legibility research by using Arabic letters as stimuli in her research. In the field of Arabic letters, it is also found that the prime effect occurs in letter identification task (Carreiras et al., 2012).



This finding may indirectly support the familiarity. In other Non-Latin letters, such as Japanese Polk and others (1997; 2009) also find that people tend to recognize word quicker than individual letters. From this finding, Polk and others proposes that people may learn letter shapes by surrounding contexts.

METHODS

403 participants were recruited in this research. All of them have no eye problem. The age ranged from 18 to 22. Participants were asked to rate their preference in a questionnaire. Next, each participant was asked to sit in front of a computer screen. When the participant got ready, a letter randomly appeared approximately 50 MS and vanished. Then the participant was asked to name the letter. The correction rate was measure between the thirteen fonts.

RESULTS

From the questionnaire, regarding visibility, TH Sarabun New had an average score of 4.34 and a standard deviation of 0.40. TH Chakra Petch had an average score of 4.04 and a standard deviation of 0.50. TH Charm AU had an average score of 3.88 and a standard deviation of 0.61. TH Chamornman had an average score of 3.79 and a standard deviation of 0.65. TH Krub had an average score of 4.30, and the standard deviation was at 0.49. TH Srisakdi had an average of 3.63 and a standard deviation of 0.65. TH Niramit AS had an average score of 4.13 and a standard deviation of 0.58. TH Kodchasal had an average score of 4.06 and a standard deviation of 0.60. TH K2D had an average score of 4.79 and a standard deviation of 0.54. TH Koho's average was 3.84, and the standard deviation was 0.64. TH Fahkwang had an average score of 3.94 and a standard deviation of 0.62. TH Mali had an average score of 4.04, and a standard deviation of 0.63 as well as TH Baijam had an average score of 4.08 and a standard deviation of 0.48.

In term of familiarity, TH Sarabun New had an average of 4.26 and a standard deviation of 0.46. TH Chakra Petch had an average of 3.75 and a standard deviation of 0.59. Charm of AU had an average of 3.74, and a standard deviation was 0.59. TH Chamornman had an average of 3.57, and the standard deviation was 0.70. TH Krub had an average of 4.06 and the standard deviation was 0.62. TH Srisakdi had an average of 3.63 and the standard deviation was 0.65. TH Niramit AS had an average of 4.00 and a standard deviation of 0.58. TH Kodchasal had an average of 3.74 and a standard deviation of 0.65. TH K2D had an average of 3.92 and a standard deviation of 0.61. TH Koho had an average of 3.57 and a standard deviation of 0.68. TH Fahkwang had an average of 3.79 and a standard deviation of 0.68. TH Mali had an average of 3.88 and a standard deviation of 0.75 as well as TH Baijam had an average of 3.86 and a standard deviation of 0.56.

In term of beauty, TH Sarabun New had an average of 3.81 and a standard deviation of 0.61. TH Chakra Petch had an average of 3.59 and a standard deviation of 0.57. TH Charm of AU had an average of 4.01 and a standard deviation of 0.54. TH Chamornman had an average of 3.87 and a standard deviation of 0.64. The Krub's mean was 3.72, and a deviation was 0.65. TH Srisakdi had an average of 3.84 and a standard deviation of 0.66. TH Niramit AS had an average of 3.79 and a standard deviation of 0.65. TH Kodchasal had an average of 3.63 and a standard deviation of 0.68. TH K2D had an average of 3.73 and a standard deviation of 0.72. TH Koho had an average of 3.54 and a standard deviation of 0.71. TH Fahkwang had an average of 3.37 and a standard deviation of 0.79. TH Mali had an average of 3.70 and a standard deviation of 0.71. TH Baijam had an average of 3.67 and a standard deviation of 0.64.

In term of modernization, TH Sarabun New had an average of 3.49 and a standard deviation of 0.72. TH Chakra Petch had an average of 3.43 and a standard deviation of 0.67. TH Charm of AU had an average response



of 3.21 and a standard deviation of 0.7. TH Chamornman had an average response of 3.26 and a standard deviation of 0.79. TH Krub had an average response of 3.60 and a standard deviation of 0.67. TH Srisakdi had an average response of 3.24 and a standard deviation was 0.78. TH Niramit AS had an average response of 3.63 and a standard deviation of 0.72. TH Kodchasal had an average response of 3.46 and a standard deviation of 0.72. TH K2D had an average response of 3.69 and a standard deviation was 0.69. TH Koho had an average response of 3.46 and a standard deviation of 0.73. TH Fahkwang's mean was 3.37 and a standard deviation of 0.79. TH Mali had an average response of 3.64 and a standard deviation of 0.72. Besides, TH Baijam's mean was 3.71 and a standard deviation was 0.66.

In term of Eye comfort, TH Sarabun New had an average of 4.04 and a standard deviation was 0.66. TH Chakra Petch had an average of 3.49, and a standard deviation was 0.71. TH Charm of AU had an average of 3.17 and a standard deviation of 0.73. TH Chamornman had an average of 3.28, and a standard deviation was 0.78. TH Krub had an average of 3.92, and a standard deviation was 0.61. TH Srisakdi had an average of 3.10 and a standard deviation of 0.73. TH Niramit had an average of 3.86 and a standard deviation of 0.63. TH Kodchasal's average was 3.63 and a standard deviation was 0.75. TH K2D had an average of 3.83, and a standard deviation was 0.72. TH Koho had an average of 3.33 and a standard deviation was 0.79. TH Fahkwang had an average of 3.56 and a standard deviation was 0.57. TH Mali had an average of 3.61 and the standard deviation was 0.72. TH Baijam had an average of 3.71, and a standard deviation was 0.66.

In term of reading speed, TH Sarabun New had an average of 4.08, and a standard deviation was 0.61. TH Chakra Petch had an average score of 3.69 and a standard deviation was 0.64. TH Charm of AU had an average of 3.30, and a standard deviation was 0.67. TH Chamornman had an average of 3.27, and a standard deviation was 0.68. TH Krub had an average of 3.93, and a standard deviation was 0.66. TH Srisakdi had an average of 3.21, and a standard deviation was 0.70. TH Niramit had an average of 3.81, and a standard deviation was 0.65. TH Kodchasal had an average of 3.76, and a standard deviation was 0.67. TH K2D had an average of 3.90, and a standard deviation was 0.54. TH Koho had an average at 3.47, and a standard deviation was 0.69. TH Fahkwang had an average of 3.51, and a standard deviation was 0.73. TH Mali had an average of 3.54, and a standard deviation was 0.72. TH Baijam had an average of 3.73, and a standard deviation was 0.58.

In term of formality, TH Sarabun had an average of 4.11 and a standard deviation of 0.53. TH Chakra Petch had an average of 3.65 and a standard deviation of 0.72. TH Charm of AU had an average of 3.27 and a standard deviation of 0.75. TH Chamornman's mean was 3.28, and a standard deviation was 0.74. TH Krub had an average of 3.82, and a standard deviation was 0.72. TH Srisakdi had an average of 3.16, and a standard deviation was 0.79. TH Niramit had an average of 3.78, and a standard deviation was 0.65. TH Kodchasal had an average of 3.34, and a standard deviation was 0.82. TH K2D had an average of 3.72, and a standard deviation was 0.71. TH Koho had an average of 3.32, and a standard deviation was 0.82. TH Fahkwang had an average of 3.29, and a standard deviation was 0.74. TH Mali had an average of 3.36, and a standard deviation was 0.75. TH Baijam had an average of 2.23 and a standard deviation was 0.81.

In term of preference, TH Sarabun had an average of 3.65 and a standard deviation of 0.70. TH Chakra Petch had an average of 3.26 and a standard deviation of 0.81. TH Charm of AU had an average of 3.53 and a standard deviation of 0.83. TH Chamornman's mean was 3.36, and a standard deviation was 0.86. TH Krub had an average of 3.55, and a standard deviation was 0.79. TH Srisakdi had an average of 3.32, and a standard deviation was 0.84. TH Niramit had an average of 3.46 and a standard deviation of 0.79. TH Kodchasal had an average of 3.42 and a standard deviation of 0.85. TH K2D had an average of 3.42 and a standard deviation of 0.70. TH Koho had an average of 3.25, and a standard deviation was 0.79. TH Fahkwang had an average of 3.21, and a standard deviation was 0.66. TH Mali had an average of 3.47 and a standard deviation was 0.83. TH Baijam had an average of 3.55, and a standard deviation was 0.64.



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In short exposure test, there is no significant difference between fonts. The correction rates in the letter identification between the groups are almost the same.

CONCLUSION AND FUTURE WORK

In this study, the result from both the questionnaire and the short exposure test found no significant difference between the groups; therefore, the data may support the familiarity principle suggested by Licko (1990) which states that “we read best what we read most.” Familiarity may be the key factor in the letter identification. For the future works, the research could be extended by using other legibility tests including continuous reading and visibility threshold to verify the result whether the familiarity of style is the main factor in reading.

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**Recontextualization as Adaptation Technique
to Recreate the Bleak Ending for Agatha Christie’s *And Then There Were None***

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ABSTRACT

Agatha Christie is arguably the world’s most successful female writer. Her novel *And Then There Were None* is the best-selling crime novel of all time. Ten strangers lured to an island mansion and killed one by one until there are none is the plot that fascinates readers who vote Christie’s work as the most popular novel. However, when Christie adapted the novel into a play, she changed the miserable ending to a happy one with two characters surviving and falling in love with each other. This practice-as-research project explores how recontextulization can be used as adaptation approach to recreate the bleak ending of the original for a play staged for Thai audience. To restore the novel’s ending, the last character survival needed to be driven to suicide. The adaptor employed the concept of Karma in Buddhist belief, which corresponded to the theme of justice and guilt in the novel, as a base to rework the plot and the characterization. Christie’s foreshadowing nursery rhyme “Ten Little Indians” was replaced by a newly-composed poem based on Thai traditional game “Mon Sonpa” to offer a sense of familiarity and mystery to the Thai spectators. The game and the poem are also used as a reminder of a dead child for the last survivor driving her to hang herself like in the novel. The recontextualizing technique offered not only a chance for the adaptor to recreate the bleak ending for the play, but also additional mystery based on Buddhist belief.

Keywords: *Adaptation, Agatha Christie, Recontextualization*

INTRODUCTION

In 1943, Agatha Christie’s best-selling book of all time, *And Then There Were None* (ATTWN), was staged in the UK. This was the first time Christie adapted her own work for stage after many adaptations by other playwrights who did not satisfy her. Having consideration of the war time context of the production, Christie agreed with the producer’s suggestion to change the bleak ending of the novel to happy ending to offer an escape from reality for the audience’s satisfaction (Green, 2015). Reviewing the play from contemporary perspective, the happy ending seems to ruin the spirit of the original version which is mysterious and cynical. Therefore, to translate the play for my students’ degree project in 2016, I aimed to restore the bleakness of the play.

The plot of ATTWN was about ten strangers that were lured to an island mansion off the coast of Devon by the mysterious host. After supper, a gramophone record is played. A voice of unidentified person accused each of them of the murder they have committed but escaped justice. The guests were trapped on the island, and were killed one by one in a way that seemingly corresponds to the nursery rhyme, Ten Little Indians. The last survivor finally hanged herself like the ending of the rhyme.

Adapting ATTWN for the stage had some major challenges, such as how to reveal the murderer’s secret and how to drive the last survivor to commit suicide. Ten murders in one play with no such survivor was an intricate and baffling novel plot that Christie needed to use an epilogue to explain the killer’s perfect murder plan. In the novel, the killer pretended to be killed, and secretly continued his plan. He finally set up a psychological trick driving his last victim to commit suicide before taking his own life, and leaving a letter



to explain everything. In Christie’s stage version, the killer revealed his plan to the last survivor, Vera. Then he was killed by Lombard, who pretended that he was previously shot dead. Vera and Lombard fell in love with each other, and happily lived together like other popular theatres of the time. To restore the original ending, it is possible to follow Christie’s stage version that the killer himself reveal his murder plan. The major challenge is to find the replacement for the killer’s psychological trap that can convincingly drive the last victim to commit suicide.

LITERATURE AND THEORY

Adaptation as an academic field may have established itself later than translation studies; however, the nature of the two branches are closely related, as Krebs (2012) points out that they “discuss the phenomena of constructing cultures through acts of rewriting, and concern the collaborative nature of such acts as well as the subsequent and necessary critique of notions of authorship.” Krebs (2014) also proposes that translation and adaptation “are an integral and intrinsic part of our global local political and cultural experiences, activities and agendas”. Therefore, instead of separating adaptation studies and translation studies or focusing on similarities between both translational and adaptation process, products and methodologies would be more constructive and productive way forward (Krebs, 2012). With the references, Krebs’ proposition is agreed in this project, and a translational concept is employed as a framework for adaptation.

My adaptation approach is derived from a translational concept which initially proposed in early 19th century by German philosopher Friedrich Schleiermacher, and revived by Lawrence Venuti in his book *The Translator’s Invisibility* (1995). Schleiermacher (1813) separates two translational strategies explaining that in any translation which a translator has to make a decision either to “leave the author in peace, as much as possible, and moves the reader towards him; or to leave the reader in peace, as much as possible, and moves the author towards him.” Venuti calls the first method as foreignisation and the second one as domestication. In this project, domesticating approach is employed to recreate the bleak ending of *ATTWN* for Thai audiences.

It is observed that there are some similarities between Christie’s theme of guilt and justice and Buddhist concept of Karma which can be used as a base to create a convincingly dark ending for the Thais. In the novel’s epilogue, the killer explains his psychological assumption about his last victim:

I set the stage in her bedroom.
It was an interesting psychological experiment. Would the consciousness of her own guilt, the state of nervous tension consequent on having just shot a man, be sufficient, together with the hypnotic suggestion of the surroundings, to cause her to take her own life? I thought it would.
(Christie, 2015)

Having been watching Vera shoot Lombard to dead, the killer went in Vera’s bedroom setting up a rope with a noose, hanging from the ceiling, and a chair under it. Extremely exhausted with tension of witnessing nine deaths, Vera saw the noose and thought about a boy whom she intentionally let drowning in the past. Vera finally hanged herself.

From Buddhist perspective, Vera’s automaton suicide can be seen as a result of Karma. The word ‘karma’ means ‘action’. The law of karma states that every intentional act brings about a certain result over a period of time. The karmic consequence is inevitable. Bad karma will lead to an unpleasant human situation in this life, after life like in hell or in the future life, and good karma will bring a pleasant result. There are various stories told among Buddhists about people’s suffering before their death due to evil karma committed in the past. Pre-death mental illness can be seen as being haunted by karma.

In this project, the Buddhist belief is used to restore the bleak ending of *ATTWN* for Thai audiences by retelling the story in a Thai-Buddhist context. My adaptation of *ATTWN* corresponds to a definition stated by



Sanders (2006) that adaptation is “reinterpretation of established texts in new generic contexts or perhaps with relocations of an ‘original’ or source text’s cultural and/or temporal setting.” Therefore, this work applies the term recontextualization rather than domestication to avoid connotative meaning of the term as suggested by Venuti (1995) that domestication is “an ethnocentric reduction of the foreign text.”

Recontextualizing Agatha Christie’s *And Then There Were None*

To recontextualize is to recreate the story in a new cultural and temporal setting. This is a complicated process involving analyzing and interpreting the source text, and then replacing dramatic elements of the original version with their equivalences from the target context. The adaptor; thus, functions like an original playwright for the target audiences. The main points of adapting *ATTWN* based on Thai-Buddhist beliefs are as follows:

1. *Reworking the character’s background*

The setting of the play was changed from an island off the coast of Devon to an island off Ranong, a province in the south of Thailand. The play was set in 2500BE, a turning of Thai century. Most of Christie’s characterization was maintained. The important changed was in the character of Vera Claythorne, the last survivor. Vera was a teacher who came to the island for a secretarial job during her school holidays. Vera’s secret guilt was that she used to trick her student, a boy named Cyril (or Peter in the play), to swim out into the sea and get drowned so that her lover, the boy’s uncle, could inherit a fortune from the boy’s father. In the play, Christie changed Vera’s background that the boy’s death was really an accident. Therefore, she deserved to survive and fell in love with Lombard, the other character whom Christie made innocent in the stage version. Vera’s guilt was retained in this Thai adaptation. Some insertions were made to remind Vera of her past karma, which would drive her to commit suicide in the end. The ten Indian statuettes in Christie’s play were replaced by ten children statuettes playing “Mon Sonpa,” a Thai traditional game which Vera’s dead student loved to play. Therefore, Vera was stunned when she first saw the statuettes in the island house. Later, in the climax scene, she revealed to Lombard that the statuettes reminded her of the dead boy. The “Mon Sonpa” game was also used as a motif and as a supernatural force driving Vera to her death.

2. *Recreating the motif*

Nursery rhymes were used as motifs in many of Christie’s works, “Three Blind Mice” in her short story with the same title, for instance. In *ATTWN*, the “Ten Little Indians” rhyme was employed, with the ending of the poem becoming the novel’s title. In the novel, a framed copy of the rhyme was in each of the guest bedroom. After a few deaths, the character learned that the murderer planned to kill each of them matching with the little Indians rhyme. There were also ten little Indian figures on the dining table, and after each death, one of them mysteriously vanished. The nursery rhyme and the figures served well in Christie’s play that began with a lovely house decoration scene, and then the following scenes gradually turned to scary foreshadowing. There was no equivalence of the Ten Little Indians rhyme in Thai; therefore, it was newly composed.

To make the rhyme familiar for Thai audiences, it was written in reference to the Mon Sonpa game (Mon hides a cloth). In order to play this game, a group of children sit in circle. One player acts as Mon, and the other players sing the “Sonpa” song. While the other players sing, the Mon walks around the circle carrying a piece of cloth. The Mon drops the cloth behind one of the players, who needs to pick up the cloth as catching the Mon before he/she can sit at his/her place. The new rhyme alluded to the Sonpa song offering a familiar sense for Thai audiences. Therefore, the Thai rhyme performed similar functions with the original.



In addition, it provided extra pressure on Vera which was not the case in Christie’s work. As the rhyme was recited many times throughout the play since the character worried about their lives, Vera became mentally affected by the rhyme. She was obsessed with it so strongly that at the end, she hanged herself following its last line: “one little Indian boy left all alone; He went and hanged himself and then there were none.” With the connection between the Mon Sonpa game and the dead boy, Vera perceived that the rhyme was not only a death warning, but also a reminder of her guilt. In a sense, the new rhyme was the past karma which kept haunting Vera until the end of her life.

3. Restoring the bleak ending

Christie’s novel and play script had the elements on both supporting and resisting the restoration of the dark finale. The ending of this recontextualized version was created with the combination of the original ending and the ending of Christie’s stage version, plus new supernatural and psychological elements based on Thai context. In the novel, Vera’s suicide was triggered by the murderer’s plan. When it succeeded, he then took his life leaving a letter explaining everything. This denouement was not suitable for stage performance because the spectators should observe the event unfold rather than listened to a policeman reading the killer’s note. Christie’s stage version provides a solution for this: after covertly observing a fight between Vera and Lombard ending in the former shot the latter (supposedly dead), the murderer disclosed himself explaining his plan and motivation to his last victim. This form of denouement was maintained. However, the final result which Lombard revived and shot the killer to dead was removed. The climax scene in the Thai adaptation was a revelation of the murderer following by the fight between him and Vera. The latter finally grasped Lombard’s gun and shot him.

There was an amendment of the killer’s words before he died. In Christie’s play, he was saying “I must have my hanging — my hanging” as he obsessively tried to kill Vera. In the Thai adaptation, knowing that he was lost, the killer’s last words to Vera could be literally translated as “even though you can escape, you will never escape your karma. It will vindictively follow you until you die.” This change was done to plant fear for karma in the character’s mind. The Mon Sonpa game was used again to drive the character to the state of surrender her life.

Exhausted from all the tension, Vera sat down and closed her eyes. The ending of the recontextualized *ATTWN* read:

A boy’s giggle can be heard from distance and follows by the boy’s voice singing the Mon Sonpa song. Vera sat up and looked around. A shadow moves past the window. Vera makes a quick turn.

Vera: [calling the dead boy’s name] Ekalak?

The boy’s giggle can be heard again. Vera is scared. The shadow moves past the window again.

Vera: Ekalak... I’m sorry...

She saw the rope with a noose [leaving by the killer]. She picks it up and slowly walks upstairs.

The stage lights dim

Suddenly, Vera’s body can be seen hanging at the upstage window.

The stage lights quickly fade to black.

From Thai perspective, this happening may be perceived in two ways. From the psychological explanation, Vera’s guilt would have tormented her to extreme depression that she had hallucination. From supernatural view, the dead boy’s spirit had followed Vera waiting for payback. Both were convincing interpretation for Thai audiences.

4. Renaming the title

The ending of the Thai *ATTWN* corresponded to a Buddhist saying that you may escape the law, but you cannot escape your karma. This concept was the theme for this Thai adaptation. There was a change in Christie’s dialogue to highlight the theme. In the scene when the guests discussed the death of the butler’s wife who died from heart failure, Miss Brent said that her death was caused by her guilty conscience: “Call it, if you prefer, An Act of God” (Christie). In the Thai adaptation, Miss Brent’s line was changed to: “Call it whatever you prefer, it’s still a karma...the karma which vindictively follows the one who commits it.”

The title of Christie’s novel and play came from the last line of the Ten Little Indians rhyme. As the rhyme was removed from this Thai version, the play was then given the Thai title as *Kum Payabart* (Vindictive Karma).

CONCLUSION

One aspect of smart culture is to learn, and to share their knowledge with other cultures. This is for every culture to take the full advantage of the information flowing around in this age of communications technology. Theatre adaptation as a cross-cultural process promotes smart culture by channeling arts from one culture to another. In this project, adaptation functions in two levels. First, adaptation offers the full dramatic power of the original by merging Agatha Christie’s novel with her stage version restoring the bleak ending for contemporary audiences. Secondly, adaptation offers creative interpretation based on the target-culture perspective. This adaptation was performed in November 2016 as a degree project of students from the Department of Performing Arts, Suan Sunandha Rajabhat University.

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Cross-disciplinary Research in the South: Weaving a Tapestry of Theatre, History, and Art

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ABSTRACT

This paper is a case study of cross-disciplinary research outside “immediate” discipline/specialty—theatre conducted in May 2018 by the cooperation of Denise Harrison, an English/Pan African Studies professor and also a quilt artist. This research was a five-day research trip to Gee’s Bend (currently called Boykin), Selma, and Montgomery, Alabama.

This paper examines this trip’s cross-disciplinary and experiential values; I will specifically investigate how this type of experiential and cross-disciplinary research serves as a multifaceted scholarly and educational synergy integrating theatre, history, performance, activism, art, and culture in order to bring new perspectives and ideas onto the research and teaching platform. The critical points in my presentation include (1) The importance of cross-disciplinary studies, (2) History (including the period of the civil rights movement) of Gee’s Bend and their quilts, (3) Elyzabeth Gregory Wilder’s play entitled *Gee’s Bend* (premiered at the Alabama Shakespeare Festival in 2007) and her dramaturgical integration of history of Gee’s Bend, (4) Other key cultural relativisms and places during the trip that informed me of the depth and scope of history of the United States and the examination of how they can serve as “performative” sites; and (5) In what way researchers and educators can apply cross-disciplinary research (in this case experiential) to further scholarship and teaching.

Keywords: *Cross-disciplinary research, Gee’s Bend, Quilts*

In May 2018, with Denise Harrison, an English/Pan African Studies professor and also a quilt artist, I (a scholar and teacher of theatre) made a 5-day research trip to Gee’s Bend (currently called Boykin), Selma, and Montgomery, Alabama. This paper examines cross-disciplinary and experiential ramifications discovered in this trip; I will specifically investigate how this type of experiential research serves as a multifaceted scholarly and educational synergy integrating theatre, history, performance, activism, art, and culture in order to bring new perspectives and ideas onto research and teaching platforms.

The Importance of cross-disciplinary studies

The difficulty of placing “theatre” in one single category (or department) itself attests to relevance of exercising cross-disciplinary practices in research and teaching. Theatre is, by nature, interdisciplinary and cross-disciplinary. It is a study of communication, art, history, music, dance, culture, literature, and more. Until the 1960s and 1970s, “theatre” was not considered a single, (separate) academic unit as evidenced in its “home” departments, such as a speech department, communications department, and English department. Even today, many institutions consider (rightly so) “theatre” as an academic unit with multiple disciplines.

I have been adopting an interdisciplinary and cross-disciplinary approach to my specialty, theatre, over 35 years. I obtained a B.A. and M.A. in English and theatre. My Ph.D. was in theatre history and criticism with Women’s Studies as my minor. My academic background has led me to research, investigation, publication, and teaching in cross-disciplines, allowing me to push the traditional academic boundaries.



This research trip to Alabama is an extension of my ongoing exploration and research which use a cross-disciplinary approach. The trip to Alabama has provided an opportunity to understand how a research trip, in its entirety, serves as an organic and living site of cross-disciplinary research on humans and their past (history) and present.

Recently, more scholars and educators champion cross-disciplinary and interdisciplinary research and education, point to its value and efficacy in education and literacy. Examining cross-disciplinary conversations among teachers, Ashley Boyd, a scholar and professor of English Education, states that in “the current social context in the United States” which is “one of the growing political turmoil and racial unrest,” educators need to bring controversial yet important topics as racism, racially-motivated crimes, police brutality, sexism and classicism into the educational arena (Boyd & Glazier, 2017).

Pil Hansen, a scholar of cross-disciplinary research, argues that “performing arts scholars draw theories and methods from a broad range of disciplines to investigate and (re)interpret subsections of their shared meta-subject” (Hansen, 2017). In addition, Augusto Boal (1995) states that theatre “allows” a human to “observe” himself/herself “in action and activity.” Hansen’s view of performing arts as a site of multidisciplinary investigation and Boal’s observation of activist theatre underscore the dynamics of actions, history, lives, theories, and practices in theatre of everyday life.

Gee’s Bend: Brief History of Gee’s Bend

Gee’s Bend, currently named Boykin, is located in north of Camden, across the Alabama River. The name “Gee’s Bend” is derived from the first plantation owner and the shape of the river (which is curved inward). In 1816, Joseph Gee, a landowner from North Carolina, established a cotton plantation. He had seventeen slaves. In 1845 the plantation was sold to Mark H. Pettway and that is why so many the residents of Gee’s Bend have this surname. After the emancipation, many freed slaves stayed on the plantation as sharecroppers. In 1900, a white planter named Adrian Vande Graaff purchased his first four thousand acres, re-implementing the antebellum structure/system in the post-emancipation period.

In the 1930s, a merchant named E. O. Reinz gave credit to the families of Gee’s Bend. However, when he died, his estate foreclosed on his debtors who took any movable properties away (Beardsly, 2002). In the 1930s and 1940s, much of the land of this area was sold to the federal government. The Farm Security Administration (a New Deal Agency) set up Gee’s Bend Farms, Inc., a pilot project of the cooperative-based program, to help sustain the inhabitants of the area (Stevens, 2007). Nevertheless, the federal governmental subsidies did not sustain the livelihood of the residents. Today, the population of Gee’s Bend is around 100, and most of them are seniors.

Gee’s Bend and the Civil Rights Movement

Gee’s Bend is also an important marker of the Civil Rights movement. During the 1960s, whites in the South, including the residents and legislatures of Alabama, continued to try to block the participation of blacks in the legislation process. In 1962, Wilcox County officials terminated ferry service across the Alabama River. People in Gee’s Bend had no other choices except to drive two hours to get to Camden, the county seat. The registration itself had been already difficult due to the nation-wide disfranchisement (Stevens, 2007). In many places in the South, protest marches for desegregation and equal rights in voter registration in Selma, Alabama, which is located northwest of Gee’s Bend, were prepared..

In February 1965, three weeks before the Bloody Sunday in Selma (the first attempt of peaceful protest walks in March 1965), Martin Luther King Jr. visited Gee’s Bend. He encouraged them to go to Camden, though difficult without the ferry transportation, to register to vote. Consequently, some of Gee’s Bend residents shared



cars and mules, and some of them walked to go to Camden. On a side note, Gee’s Bend’s mules are now remembered in association with Martin Luther King Jr.; after Dr. King’s assassination in April 1968, two mules from Gee’s Bend pulled the farm wagon bearing his casket through the streets of Atlanta.

Gee’s Bend Quilts

In spite of its history of the antebellum, emancipation, and the civil rights movement, today, Gee’s Bend is known for only one thing (i.e., quilts). Gee’s Bend Quilts have been the residents’ historical (as well as artistic) documentation of their sustainability in the past and present. Women in Gee’s Bend have created quilts from used fabrics (i.e., old jeans, shirts, sacks, and fabric samples). Dating from the 1920s to the present, women have produced hundreds of quilt masterpieces in bold and improvised geometries. The public began to pay attention to their works when some of their quilts were exhibited at the Museum of Fine Arts Houston in 2002, followed by other museums including the Indianapolis Museum of Art, the Philadelphia Museum of Art, the Tacoma Art Museum, and the Whitney Museum of American Art. The exhibitions attracted artists, historians, scholars, and journalists, inspiring many to (re)discover folk arts in the South and to (re)interpret their works in the historical context.

Exhibiting the quilts has created a number of critical questions. For instance, one may ask whether the quilts that were created and used for survival in a museum encourage the viewers to stereotype and fetishize the quilters and their products (quilts). Christine Tate (2003) points to the very question in her review that “Does hanging these quilts on bare white walls fetishize them beyond recovery?” and “Can/should the agency of the quilters themselves be reflected in such a milieu?” These questions about the danger of objectifying “the others” need to be addressed when the viewer/object relationship is established in an exhibition and theatre sites. Postcolonial and feminist theories are added to research and examination of the Gee’s Bend quilts, making this research (of the history and quilts) more theoretically inclined, and consequently raising it to another level of interdisciplinarity.

Elyzabeth Gregory Wilder *Gee’s Bend*

In addition to the quilts, my interdisciplinary and cross-disciplinary project with collaborator Denise Harrison (Pan African Studies) was also inspired by Elyzabeth Gregory Wilder’s *Gee’s Bend* (premiered at the Alabama Shakespeare Festival in 2008). Wilder’s play captures 70 years of the life of Sadie Pettway from a young girl to a wife, to a mother, and then to an activist.

The play consists of three parts. The first part takes place in 1939. Sadie Pettway was a teenager living with her mother, her sister Nella, and her father (never appears in the play). Like her mother, she was a good quilter. She also loved reading—the only reading material available to her was old newspaper used for plastering walls.

The second part takes place in 1965. Sadie was in her early 40s and was married with children. Sadie attended the lecture given by Dr. King who visited Gee’s Bend. In history, Dr. King preached at Pleasant Grove, Baptist Church and told the congregation that their presence gave him new courage and new determination” (Arnett, Wardlaw, Livingston, & Beardsley, 2002). In the play with her sister, Nella, Sadie went to Camden to register to vote. There, she again saw Dr. King who drank water from the whites-only fountain. She tried to do the same thing, only to be stopped by her husband Macon.

Three weeks after this incident, Sadie went to Selma to join the march (this is the first attempt to march from Selma to Alabama, and it is now remembered as Bloody Sunday). Attacked by the police and blinded by tear gas, Sadie came back to her house in Gee’s Bend. Macon was infuriated, and locked her out of their house. While sleeping in the porch for three nights, Sadie decided to go back to Selma to join another march. However, knowing that her husband’s illness was getting worse, she ultimately decided to stay in Gee’s Bend. After Macon’s death, Sadie continued to create quilts and started to sell some of her quilts.



The third part takes place in 2002. The Gee’s Bend quilts were exhibited in a museum, and Sadie and Nella traveled there to see their quilts. Some months after, Sadie’s daughter left Gee’s Bend. Instead of selling her house, Sadie bought her daughter’s house to preserve “the past” and continued to live in Gee’s Bend.

The play tells the history of Gee’s Bend, focusing on women and their survival and activism. The play also illuminates resiliency and creativity as manifesting Sadie’s activism as well as her quilts. It also reminds us of how easily we, as the outsiders, are drawn to objects, artifacts, and pieces of art which are displayed in a museum, rather than to real people.

The play is filled with music that signifies the spiritual aspect of Gee’s Bend community. In her interview with me, Wilder said, “Gee’s Bend is a deeply spiritual community and music is seen as an extension of prayer.” “I added music to the play as she listened to the community singing while staying in Gee’s Bend” (Wilder, personal communication, September 20, 2018). Reading and examining the characters and events in the play allowed me to understand the role of literature and drama as historical materials; in other words, I could see how Wilder’s play served as a “history material” to know, through theatre, about the civil rights movement, which is one of the important topics in my multicultural theatre and theatre history classes.

Cross-disciplinary conversations allow people to connect separate dots to see an object, a person, and an event more organically. Sadie’s lines from Elyzabeth Gregory Wilder’s *Gee’s Bend* explain how their individual and communal lives (i.e., birth, life, and death) are sewn into the quilts and how one single artwork (like a quilt) serves as an invaluable historical document.

“You say Gee’s Bend ain’t give you nothing, you look up at them quilts. It’s the cotton from that land holding these quilts together. Our blood and our tears melted into the seams. Them quilts could tell stories these people’ll never know. They don’t know the babies born in the love that’s been made. Little pieces of our lives sewn up in those quilts. Little pieces of our history. We made them, cause had nothing else” (Wilder, 2008).

A Trip as Cross-disciplinary Research and Research Tool

Traveling is one of the most engaged methods of learning that constantly requires an adaptation of cross-disciplinary and interdisciplinary subjects and approaches. Although the objective was to explore and understand the history of Gee’s Bend by focusing on art (quilt), theatre (Elyzabeth Gregory Wilder’s *Gee’s Bend*), and music (Wilder’s *Gee’s Bend*), travelling provides one with rich social, political, and cultural histories of multiple places that go beyond the original parameters of research (in the case of our trip, Gee’s Bend). Patricia L. Mokhtarian, a scholar of civil and environmental engineering and transportation, states, travel can be driven by an individual’s desire to do “something extraordinary,” different from the routine of everyday life (Mokhtarian, Salomon, & Singer, 2015). I argue that “embracing the past and present” can be added to this category. The following are highlights from my trip that inspired me to re-examine what I have previously learned from written materials (e.g., books and articles).

I understood more about the “ferry” which was once terminated for the purpose of disfranchisement by actually taking a ferry from Camden (the service resumed in 2006) to cross the Alabama River. By conversing with four quilt-makers in Gee’s Bend, I began to see the Gee’s Bend as actual people, rather than just the “name” in a book. They are living “vessels” of history; these women were small children in 1965 and none of them attended the speech that Dr. King gave in Gee’s Bend. However, all of them knew someone who attended the lecture. During the visit, I learned that quilt making is the integral part of lives of the older generation of women, while they are facing the danger of “extinction” of their community simply due to the fact that young people have left the place.

Our next destination after Gee’s Bend was Selma, Northwest of Gee’s Bend. Visiting Selma provided me with the opportunity to know details of the marches in Selma in 1965. In Selma, we visited the cultural center and also crossed the icon of the civil rights movement, the Edmund Pettus Bridge. We drove to Montgomery,



passing various sites where the marchers in 1965 stopped to rest on their way to Montgomery. This actual travel, though done by a modern, comfortable van, allowed me to see the role of their walk (to Montgomery) as the political and performative event as well as the historical marker.

The highlight of our visit in Montgomery was the Equal Justice Initiative Museum and Memorial. The Museum’s exhibitions are highly interactive using various media including holograms and videos. Over the specially devised phone, one can listen to listen to the inmate (e.g., those who were projected on the screen) who explains the circumstance of his or her incarceration. The museum encourages its patron to “experience”—of course with necessary limits—rather than passively viewing the exhibits.

The Memorial, which opened in April 2018, was the first memorial to commemorate victims of enslavement and other violence including lynching. The memorial structure on the center of the site is constructed of over 800 steel monuments, one for each county where a lynching took place. The names of the lynching victims are engraved on the columns (EJI, n.d.). This living, commemorative, and historical memorial can be seen as the “site-specific” theatre.

CONCLUSION

As Ashley Boyd reiterates, teachers need to embrace “a type of collaboration characterized by dialogue that pushes the boundaries of social norms and goes beyond surface-level solution” (Boyd & Glazier, 2017). I believe that our collaboration has pushed and will continue to challenge our respective boundaries of academic norms and limitations.

Discovering a cross-section between history and art through a specific subject (i.e., the Gee’s Bend quilts in this case) is a result of this research/research trip. As Géraldine Chouard (2008) argues in her comparative analysis on Gee’s Bend’s photography and quilts, “in the same way that photography in the 1930s” informs its viewers of “a certain type of order to be established,” the Gee’s Bend quilts “allowed the values of this community to come to the fore and to find their own aesthetic order in the midst of political, economic and social disorder.”

This analysis of my research trip has informed me of the value of “crossing” disciplines in order to conduct more inclusive, integrating, and citizenship-focused research and education, and apply it to scholarship and teaching. The goal Denise and I have at this point is to present our research (i.e., Denise will be making quilts) at a national conference. I also plan to use this research trip in my teaching. For example, what I learned from the trip, including interviews we conducted in Gee’s Bend, can be used as dramaturgical material shared with my students when we study Wilder’s play.

The trip also allowed me to see the Museum and Memorial of the Equal Justice Initiative as an example of site-specific “documentary” theatre. This will serve as an excellent case of “theatre” in everyday life. The research trip allowed me to revisit critical theories to question and challenge what one often takes for granted or what one tends to neglect, including the power relationship between the privileged and the process of objectification that operates in an exhibition as in the case of the nation-wide Gee’s Bend quilts exhibitions in museums.



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The Power of Lighting to Well-Being

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ABSTRACT

In the theatrical performance world, the lighting designer controls and supports the mood of the performance moment by moment using a composition of intensity, colors and angles of light provided by specialized lighting equipment. However, outside of the theater in the real world, the lighting choices are taken for granted from the day a building’s construction is complete to the day of its renovation. As a result, older buildings have outdated lighting equipment that does not support contemporary human needs. Previous research has proved that lighting intensity, color temperature and wavelength have the connection with human melatonin concentration, secretion and suppression in nocturnal circadian rhythm. This article aims to demonstrate how lighting intensity, color temperature and wavelength affect melatonin concentration which is connected human well-being. The importance of lighting design in our daily lives and well-being should no longer be dismissed.

Keywords: *Lighting, Intensity, Color Temperature, Wavelength, Melatonin, Well-being*

INTRODUCTION

Thomas Alva Edison’s invention of the first commercially practical incandescent light in 1879 had an immeasurable impact on how we conduct our lives. No longer restricted by the availability of natural light, the electric light promised a 24-hour lifestyle both indoors and outdoors. No longer were human beings bound by an ordinary body cycle that woke-up with the rising sun, and slept during the dark of night. Unlimited lighting was empowering to our productivity, but what about to our well-being? It is important that we examine and track how many hours we are exposed to sunlight daily, what happens when we do not have that exposure, and what artificial lighting source would prove to be the best alternate source of sunlight for our well-being. While more research is required to determine the optimum alternate lighting source and its impact on our well-being, this paper examines previous research and presents an argument to support the need for creating artificial lighting that serves as an alternative for natural sunlight.

MELATONIN WITH ORDINARY LIFE CYCLE

Recent studies have increasingly shown the relationship between light exposure in all its different qualities with melatonin secretion and sleep cycles. According to Dr. Mark Hyman (2014), melatonin “is a key factor in determining not only how soundly we are able to sleep, but how ‘awake’ we are at peak times of the day and in the long run, whether our health improves or deteriorates.” Melatonin is a hormone known to support the sleep-wake cycle and has certain interactions with our immune system. According to Dr. Ananya Mandal (2018), “Some diseases have been shown to be associated with low levels of melatonin. These include coronary heart disease, multiple sclerosis, epilepsy, and postmenopausal osteoporosis.” Some medical researchers have argued that melatonin helps its act against cancer such as breast cancer, non-small-cell lung cancer, or live cancer (Mandal, 2018). Melatonin is controlled by daily sleep cycle. During night time, the body creates melatonin for



humans to sleep well. However, with our modern lifestyle, our circadian cycle has been disrupted. With a disrupted or unnatural sleep cycle, will our choice of artificial lighting help us cope? One simple example is that the human body does not function well after long hours of international flight. With abrupt and random lighting changes within the 14 hours of a typical international flight, the human body does not work in a routine way nor does the brain function in a conventional way. Technology has allowed humans to defy nature’s rhythms to our detriment. Can we use the same technology to support and reinforce nature’s rhythms rather than subvert them? To create artificial lighting conditions for optimal melatonin production, the following lighting elements need to be discussed.

- Color Temperature (measured in K)
- Intensity (measured in lx)
- Wavelength (measured in nm)

MELATONIN WITH COLOR TEMPERATURE

Color Temperature is the measurement of black-body radiation on the Kelvin scale (K). Low color temperature shows warm color tones to human eyes. For example, candlelight has a very warm tone with a color temperature of about 1800K. Higher color temperatures shows cool color tones to human eyes. Bright daylight measures about 5500K. Please refer to the color temperature table to see the correlation between light sources and temperatures.

Temperature	Source
1700 K	Match flame, low pressure sodium lamps (LPS/SOX)
1850 K	Candle flame, sunset/sunrise
2400 K	Standard incandescent lamps
2550 K	Soft white incandescent lamps
2700 K	"Soft white" compact fluorescent and LED lamps
3000 K	Warm white compact fluorescent and LED lamps
3200 K	Studio lamps, photofloods, etc.
3350 K	Studio "CP" light
5000 K	Horizon daylight
5000 K	Tubular fluorescent lamps or cool white/daylight compact fluorescent lamps (CFL)
5500 – 6000 K	Vertical daylight, electronic flash
6200 K	Xenon short-arc lamp ^[3]
6500 K	Daylight, overcast
6500 – 9500 K	LCD or CRT screen



Color	15,000 – 27,000 K	Clear blue poleward sky
	<i>These temperatures are merely characteristic; there may be considerable variation</i>	

temperature table (Wikipedia, n.d.)

When lighting designers choose lamps for a space, the color temperature is an important element to consider. Depending on the purpose of the space, the designers choose different color temperatures for the lamps. Warehouse spaces, hospitals and airports use high color temperature greater than 5000K which provides clear, high-quality visibility. Fluorescent and LED lamps produce higher color temperatures than incandescent lamps.

In 2014, Isamu Akasaki, Hiroshi Amano and Shuji Nakamura earned the Nobel Prize in Physics that rewarded “an invention of greatest benefit to mankind; using blue LEDs, white light can be created in a new way. With the advent of LED lamps, now have more long-lasting and more efficient alternatives to older light sources” (Akasaki, Amano, & Nakamura). With this new innovation in blue color LEDs, white light could now be created by mixing red, green and blue LEDs. This innovation, now allows white tones created with LEDs to have different color temperatures. In previous years, most LED lights had high color temperatures with low Color Rendering Index (CRI). Low CRI is how the light source accurately rendered the colors of an object. With a low CRI, the human eye could not register the red fabric colors clearly under low-priced LED lighting. This is because low-priced LED lighting contains so much of the blue spectrum in the high color temperature, it blushes red.

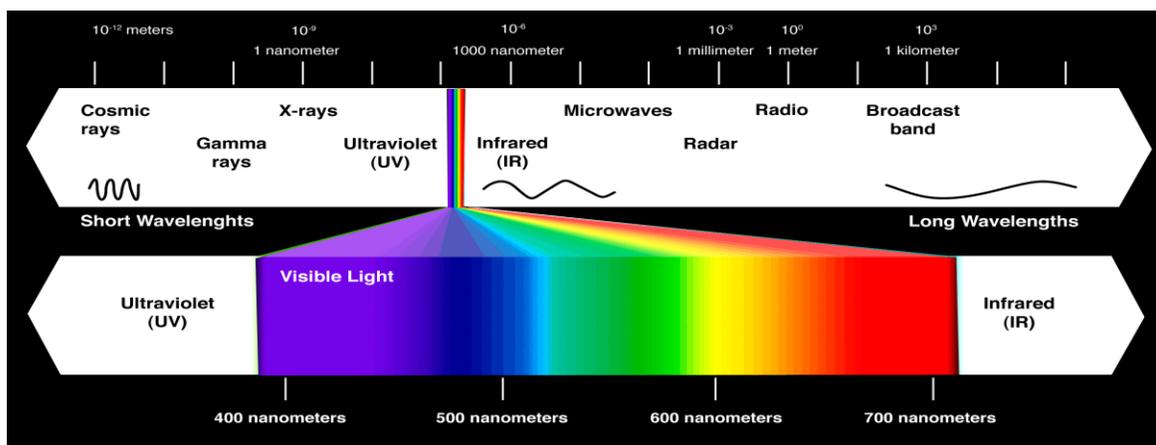
Research from Sejong University at South Korea held how different color temperatures of LED affect the production of melatonin. The study attempted to link melatonin production variations with changes in color temperature of light (LEDs with light temperatures of 3000K and 6000K at 400lx) under certain intensities by focusing on the light’s wavelength. Through the research, melatonin measurements under different color temperatures were tested. Results indicated an increase in melatonin secretion in the 3300K light environment compared with exposure in the 6000K light environment (Kim, Kim, Youm, & Choi, 2013). The lower color temperature with warm tone lighting conditions supports melatonin production.

Research from Kyushu University and Lighting Research & Development Center at Japan studied 12 healthy males exposed to different lighting sources under various color temperatures. The research showed a relationship between exposure to various color temperatures of light and melatonin concentration levels. Comparison showed significant increments after the light exposures of 2300K, 3000K, and dim. Melatonin concentrations under 5000K light exposure were significantly lower than those under dim light (Kozaki, Koga, Toda, Noguchi, & Yasu, 2008).

Recommended lamp color temperatures for regular office use is the 3500K range. Depending on customers’ request, Studio office requires high color temperature to see the clear visibility for workers. A traditional incandescent lamp has a warm color temperature; however, the office lighting has always required white tone and bluish lighting conditions.



MELATONIN WITH COLOR SPECTRUM



Electromagnetic-Spectrum (Immunolight, n.d.)

The color spectrum is visible light read by the human eye.

Human eyes can read the electromagnetic frequency wavelengths from about 390 nanometers to 700 nanometers. The visible light is seen as a rainbow. A rainbow is a meteorological phenomenon which is caused by reflection, refraction and dispersion of light in water droplets resulting in a spectrum of light appearing in the sky (Wikipedia, n.d.). This natural lighting affects the circadian rhythm in 24-hour cycles. It is now well accepted that the circadian system is maximally sensitive to short-wavelength (blue) light (peak sensitivity close to 460nm) as measured by acute melatonin suppression or phase shifting of the dim light melatonin onset [11].

At Kongju National University, the Smart Natural Space Research Center at South Korea researched the connection between short-wavelength light and melatonin producing. When a body produces melatonin, a deep body temperature drops. From the research, when going to sleep after 6 p.m., exposure to long-wavelength (warm) lighting results in the deep body temperature dropping more than during exposure to short-wavelength light (Kim, Yu, & Kim, 2017). The cool tone of blue lighting in short-wavelength light has been used most in individual devices. Due to the clearness of vision perceived by human eyes, short-wavelength light is often selected rather than long-wavelength light. However, the research showed that melatonin suppression was higher from short-wavelength light exposure than from long-wavelength light. Most personal devices do not allow us to choose a different spectrum. Exposure to short-wavelength light affects well-being.

MELATONIN WITH LIGHTING INTENSITY

This research also proved that light-induced melatonin suppression is dependent on light intensity (Kozaki, Koga, Toda, Noguchi, & Yasu, 2008). Melatonin suppression shows a significant difference between under 100lx, which is a fairly dim indoor lighting setting and 1000lx which is a bright indoor lighting setting. 1000lx with high color temperature lighting condition is typical for a working place at an airport, warehouse and hospital. Lighting intensities greater than or equal to about 2500lx produce maximal suppression comparable to near daytime values and as little as 100lx has shown to produce measurable suppression (Hebert, Martin, Lee, & Eastman, 2002). Lighting intensities less than 100lx is not recommended lighting conditions for nighttime workers.



Lighting intensity is mainly focused on the visibility. Depending on the purpose of the building or room, indoor lighting is selected for its visibility. However, residential houses have the choice of creating their own lighting conditions. Modern people work under high color temperatures with high intensity lighting conditions. When they go home, they create their own preference of lighting conditions and could be choose a dim lighting circumstance. The impact of the modern lifestyle under factory lighting may result in people choosing comfort and softness in their home lighting. Nevertheless, the dim lighting may not be right choice. Therefore, lighting for indoors needs to be examined carefully with intensity and color temperature taken into consideration to support human health.

CONCLUSION AND FUTURE WORK

In modern period, most people have several personal devices such as a phone, computer and tablet devices. About 20 years ago, we did not expect that most people would use multiple personal devices on daily base. The new technology brought different expectation as to how we communicate and how we are living. Instead of meeting in personal, we tend to text or email when we have personal and even official conversation. The life style has become private and subjective. The lighting industry has changed in last decade from incandescent lamp to LED world. While changing to a new technology, the lighting has focused on what a space needs rather than what human need for quality of life. Just as we have our own personal devices, lighting could also offer personal choices to support quality of life. Research has proven that lighting intensity, color temperature and wavelength are associated with melatonin. And now we need to think about how we could put that to use for personal choices, not only for our spaces. For future work, the research of personal lighting devices that support melatonin concentration will be beneficial.

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Sustainability in the Performing Arts

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ABSTRACT

Are old ways sustainable? This article aims to explore the dynamics between the traditional modes of what constitutes performance and the need for increasing resources in a dynamic and digital world.

The performance art disciplines of musicianship, acting and dance have been taught for centuries by utilizing the traditional resources of instruction, instruments, and studio space. The paper examines the sustainability of traditional learning formats in the digital age and how the studio practice techniques challenge and offer resources for the 21st Century Performance Artist. While modes of presenting performance work have changed, the basic fundamental structure of practice and preparation remain the foundation of training.

Examining the current practices of performing arts training, as well as trends and data from research drivers, which examine the quality of life generated by performance arts, the presentation will argue that Performance Artists presume sustainable of careers.

Keywords: *Sustainability, Performance, Arts, Training*

Sustainability in the Performing Arts

Recently, I attended a conference where a presenter confessed that the skills he learned in college twenty years earlier were now obsolete. Having majored and worked in communications and marketing, his training and education in the 1990s had not prepared him for the digital age. Consequently, he was in the ongoing process of job training. In addition, while he credited a university liberal arts education as providing him the foundations in which to apply himself to the job market, it was not the core skills he learned, but the knowledge of *how to* learn which ultimately allowed career mobility. His situation was not unique; his story can be applied to several vocations as technology advances and changes how we connect to industry. Harkening back on a time when there was not the internet, or digital literacy, or (please insert the latest technologies here) is becoming difficult. In today’s job market, techniques and technologies quickly become obsolete.

Admittedly, many lucrative professions are relatively new and benefit from innovations in data driven technology. Careers in information technology, human resources, and blogging are all recent occupations. Educators must possess keen abilities to prepare students for the careers of the future, many of which are currently and admittedly yet to be discovered. In researching the sustainability of a career, one must not only consider the core skills developed, but also account for how sustainable the actual training and education received for the longevity of the projected career. Academic and vocational training follows industry; new curriculum created from necessity often takes years to develop into an academic plan of study. Currently, for example, craft beer making is having an academic renaissance component in the United States. As universities realize the market trend towards entrepreneurial breweries and microbreweries, both of which have gained popularity in the past decade. The drive to create a sustainable industry by offering education and training in not only beer making, but also market analysis, environmental impact, and advertising all revolve around a developing industry in search of an educated work force. By all accounts, these programs are sustainable.



The United Nations World Commission on Environment and Development (1985) defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Sustainability, which is regarded as the ability to maintain at a certain rate or level, is a trending topic relatively new to higher education and borrowed from the private sector world of business. Business sustainability is often defined as managing the bottom line, whereas companies forecast their financial, social and environmental risks, opportunities and obligations. These three impacts are sometimes referred to as profits, people and planet (The Financial Times, 2018). Sustainable industries avoid the depletion of natural resources in order to succor the global environment. These hallmarks of sustainability, maintenance and environmental support are under constant analysis by industry and organizations. While this definition of sustainability presumes that resources need to be maintained and are fixed or restricted, the same definition can play an important role in the advocating for performing arts training as a sustainable commodity that has positive impact on future generations.

While modes of presenting performance work have changed, the basic fundamental structure of practice and preparation remain the foundation of training. The performing arts contribute to a sustainable future by providing social cohesion, economic vitality, cultural education and health as well as personal development. Through sustainable studio practice techniques, performing arts training provides critical resources, which develop and maintain relevance for the future of societal and cultural identities. As with the business model, arts training profits people and the planet. The sustainability of training offers resources for the 21st Century performance artist.

The Passion and a Plank Theory of Performance Training

In the arena of performing arts, sustainable methodologies identify as resources that have been consistent for hundreds of years. In the world of studio based practice, the sustainability factor is exceptionally high as the raw materials needed to train actors, dancers and musicians. A studio and a teacher have not intrinsically changed. Technology has greatly advanced the art forms contributing to the presentation and production of the performing arts. Conversely, not much has fundamentally changed in how the forms are practiced in studios. Dancers need access to a dance studio, actors need a rehearsal space, and musicians need a studio and the instrument of choice. Practice and repetition are completed in the same space, which can be sustained with basic maintenance. For this perspective, performance arts training is relatively economical. In other words, all that is needed is the persistence and dedication to practice (the passion) and a space to do it in (the plank). This simple theory of passion and a plank, which has driven the sustainability of performing arts, has recently been tested with the introduction of technology. Online education and digital caption allow the instructor and student to be in different time zones, but the training remains essentially the same. Practice, practice, practice. Repetition at the core of performing arts requires sustainable practice skills to advance to higher technical levels in any art form. While the disciplines of acting, music and dance have been appreciated since ancient times, the formal training of these forms in higher education is relatively new. Once again, the academy follows sustainable trends. Musical theatre and entertainment enjoyed for centuries is a relatively young academic discipline. University unified training of musical theatre artists only began in the late Twentieth century. The Musical Theatre program at Cincinnati Conservatory of Music (CCM) claims to be the oldest in the United States, having only been established in 1968. The proliferation of Musical Theatre programs in higher education illustrates the level of sustainability, as the demanding major is now available in over 90 college programs in the United States and gaining popularity worldwide. Music, dance and acting programs have all proven sustainable in higher education as each has allowed the next generation of artists to benefit without depleting resources. While the resources to produce musical theatre (e.g., a rehearsal hall, dance studio and a piano) are often finite, the training methodologies used are very sustainable.

The combination of passion and a plank, hard work and the space to do it in, are at the heart of performance training. The simple and untechnical approach of human contact and mentoring artists is at the



core of theatre training. Additionally, this makes the performance arts increasingly necessary in our ultra-digital and high-resolution media world. No technology, however adaptable, can compete with the human contact of a master artist training in a studio. The need for human connection is becoming more fragile and thus the need for sustainability.

Sustainability of Training Opportunities and Needs

Performance training often explores the human condition and the recreation of truthful behavior including intimacy. One area of performance training which has seen a need for reinforcements and thus creates a sustainable training program is in the creation of intimacy for the stage. Maintaining the illusion of violence has been a standard of theatrical training for decades with approaches to theatrical combat and stage fighting to provide safe and standard practices while maintaining the recreation of behaviors. In recent years, actor training has evolved and developed the need to recreate moments of intimacy for the stage. This is more evident in the digital age as the lack of physical interactions have created setbacks among younger actors in recreating intimate and truthful moments in a safe and sustainable way.

According to Psychology Today, the fear of intimacy and avoidance of closeness in relationships is the norm for about 17% of adults in Western cultures (Shorey, 2015).

Compounded with a lack of intimacy in social contexts, there also exists the need to advocate for social skills in training young people in the art of interaction as the computerized classroom focuses on a single contact and detracts from socialized behavior. As everyone focused on a screen and often a tiny one, a central criticism of computer led learning is the lack of socialization and interaction it provides. This has led school districts to develop programs in order to instill socialization in public schools. In early education, the need to socialize young students often completes with, or is as important as the need for academics. The lack of socialized interactions necessitates educators to create experiences where children can react and develop skills to teach tolerance and empathy. The need for training has developed into a new approach to performance training. Performing arts serve as a strong platform for social interaction. With the lack of confrontation afforded by physical contact, young artists are finding greater need to be coached in the ways of socialized interactions. Thus, the sustainability of performance training is aided by the way of a new career in the arts; that of the intimacy director.

Recommended and trained intimacy directors operate in a specific code of ethics with a high artistic standard, while operating their rehearsals in a professional, respectful, appropriate and amiable atmosphere. If current trends continue, the sustainability of training intimacy directors is likely to rise as socialized behaviors are becoming increasingly recognized due to the fact that acquired skills needed to improve theatrical interactions that convey deeper emotional conditions. All which contribute to academic learning and performance (Garibaldi & Josias, 2015). Intimacy Directors International (IDI) is a nonprofit organization that represents like-minded artists. The organization’s website provides a description of the work of an Intimacy director:

Intimacy for the Stage is choreographing of Moments of Intimacy in performance. The focus is on subtle and specific details in movement and intention, for the purpose of telling the story of the scene. This is not just "making out" or sex scenes, but can also encompass moments of intimacy found among dear friends, between parents and children, and can also cover scenes of sexual violence. Intimacy for the Stage has been enthusiastically received as a practice that empowers actors to respect their own boundaries while improving the quality and clarity of scenes of intimacy (Intimacy Directors International, n.d.).

In an environment where actors unaccustomed to physical contact are challenged by the creation of undisclosed moments, the use of an intimacy director allows the continuum of training. Just as the dialect coach, movement coach, stage combat or fight director and choreographer who assist in the recreation and execution of performance behaviors, the creation and development of intimacy recreated on stage becomes



part of the sustainable practices employed in arts training. This recreation may serve purpose beyond the rehearsal studio and into classrooms and boardrooms as an effective way to communicate. Imagine how the authenticity of recreating physical touch, emotional intimacy and character role-play could influence group meetings or conferences. Such interactions recognize the cultural value of the arts to transform communities, and to tackle social issues while identifying the struggle to keep relevant and valued. Although the arts have delivered this spectrum of entertainment, inspiration, and transformative value for as long as humankind has existed, they have faced a roller coaster of recognition and marginalization in our country since even before our founding. We are now; however, at a moment where there seems to be an increased recognition of the broad value of the arts (Lynch, 2015).

Sustainability of the Organizational and Artistic Mission

To be sustainable, arts organizations ensure their mission whether it is sustainable and recognized as impacting society. Impact drives arts sustainability. The public does not buy tickets or donate money to an orchestra so that it will be financially strong; they attend because they are inspired by music and recognize the impact in their community. A performing arts training program must operate on a sustainable mission that promotes cultural education and the personal development of young artists as the impact of individual artistic growth provides inspiration. The recognition of artistic excellence is a foundation of an enlightened society. Training to inspire, rather than gain financial success, should be the purpose of artistic sustainability. It is only after the mission which is clarified that the organization can work on financial, organizational and programmatic sustainability.

Musician and archeologist Scott Chamberlain writes extensively about the balance between financial sustainability and the role organizational structure plays in arts management.

Ah, “sustainable.” It is a buzzword of the moment, showing up in discussions ranging from the environment to manufacturing, agriculture...even the arts. Of course, everyone wants to be sustainable, thinking that they, their product, or their service will stand the test of time and last forever. Sustainability is, and must be, comprehensive especially for a nonprofit, which is not solely about turning a profit. ...

For many people, “sustainability” simply means *financial* stability, as if we were thinking in terms of a for-profit enterprise, which the arts are not. To define sustainability without using more holistic criteria that can better ensure arts organizations thrive, is far too narrow.

Arts organizations need to ensure their programmatic sustainability. It is only after the mission is made strong that the organization can work on financial, organizational, and programmatic sustainability. These areas are critical, but they must be put in service of making the mission strong. Otherwise, there is no reason to do any of it (Chamberlain, 2015).

A sustainable nonprofit organization has the ability to carry out activities that achieve its mission while also developing and ensuring the organization’s relevance in the future. In the world of higher education, mission is crucial in maintaining sustainability. Once the mission is secure, an arts organization can drill down into the measurements of programmatic sustainability. This ability to develop, mature, and modify training programs as needs, which are realized over time, helps arts maintain relevance and move forward. In other words, no money in the world can keep an uninspired program sustainable.

Sustainability as no longer Optional

Ian David Moss, founder of Createquity, identifies the intrinsic need for sustainability in performing arts in his article entitled Everything We Know About Whether and How the Arts Improves Lives (Moss, 2016). Moss’s research on the educational, health, economic, and other positive effects of performing arts and culture provides support to the benefits of sustainable training programs in the arts and the arts in society. The informative reports investigate how the arts and arts training improve lives in four key areas including



social cohesion, economic vitality, physical and mental health and education and personal development. While economic vitality is often recognized as the primary sustainability model in most for-profit sectors, the impact of the arts on education and personal development are equally impressive, and equally invite investigation. Moss’s report covers a broad cross section of art forms to find general effects of art on the population. The study presents significant variations between disciplines, between different modes of artistic participation and between participants. The report maintains that music is the most-studied intervention, and supports the most scholarly evidence regarding the benefits music brings to our quality of life. The report further identifies key values associated with all arts and arts training including:

- Participatory arts activities help to maintain the health and life quality of older adults.
- Arts therapies contribute to positive clinical outcomes for patients, such as reductions in anxiety, stress and pain.
- Arts participation in early childhood promotes social and emotional development.
- Student participation in structured arts activities enhances cognitive abilities and social skills that support learning, memory, problem solving, and communication.

The last point is exceptionally revealing as it identifies that performing arts training reinforces itself in the pursuit of techniques through memorization, which not only provides mastery of aesthetic practice but also supports cognitive development and socialization in young artists. In an age where social skills are taught in school along with formal curricular subjects, this is a valued commodity and adds to a sustainable society.

Sustainability as a Cultural Identity

In addition to the sustainability of technique, performance arts training affords another benefit equally more impactful as it is continued to break global boundaries through technology and the digital age. Cultural literacy, another unique position central to performing arts training is the ability to embed cultural representation into performance training practices. This allows the dance community to not only study traditional western Eurocentric dance forms (e.g., classical ballet) and European ballroom dance, but also to open the training menu to include culturally authentic practices (e.g., Irish Step dancing, Ukrainian folk dance, Balinese Kecak dance and the cultural and tribal dances of Sub-Saharan Africa). Global awareness and the need for authenticity not only allow cultural meeting points between master teachers who address the need for both cultural literacy and sharing of traditions, but also create a support for students to find similarities within the challenges of learning something stylistically diverse. In addition, there is great joy in sharing cultural traditions with others via performance work.

Recently, Kent State University’s School of Theatre and Dance benefitted from two cultural pairings in different performance disciplines. Through the Dance division and Professor Jeffrey Marc Rockland, students of Kent State have developed a sharing pattern of working with Thai dancers associated with Suan Sunandha Rajabhat University. The dancers share traditional American dance (i.e., Western dance styles) as they learn traditions specific to Thai dance culture. This intersection provides transference of cultural and aesthetic mastery of the disciplines and an appreciation for the otherness of different dance cultures. During the school’s summer program at Porthouse Theatre and with the leadership of Professor Jakyung Seo, students from South Korean universities have spent each of the last four years in residence at Kent State to learn traditional American Musical Theatre dance, and to share a traditional Korean cultural dance and song. The impact of both American and South Korean students singing in both English and Korean, during the same period in history when leaders from both nations are in summit served as a powerful representation of cultural sustainability. The union promotes a message of oneness and collaboration. These messages of goodwill and social development continue long after the performance ends as the experiences gained from each group are shared with other students back home.



Performing arts generates a cultural sustainability as the traditional methods are codified, taught, presented, and represented in small and profound intersections every time dancers, actors or singers work together. Performance arts allows a two-fold cultural sustainability. The continuance and insurance of an art form which has traditionally been preserved through practice and the appreciation and transformative awareness of exposure to traditional performance genres that are best experienced live and in community with performers. Anyone who has ever travelled abroad to be treated to a performance by local folk dancers or musicians can testify to the appreciation of a gained cultural identity through performing arts.

While performance art practices have endured centuries, no discipline or technique can assume a cultural permanence as each is transmitted from teacher to novice, and is only one generation away from extinction. To assume sustainability of any art form, it is simply because it naturally continues and defeats the purpose of advocating for arts funding, innovation and inclusivity. Social Inclusion, Cultural Education and personal development all benefit as the performing arts contribute to a sustainable future. Through sustainable studio based practice techniques, performing arts training provides critical resources, which develop and maintain relevance for the future of societal and cultural identities. A love of the arts and a passion for the people, who provide training and continue the traditions of technique and skill, promotes sustainability. For too long, many arts groups focused on financial sustainability as the sole criterion to access an organization’s health. The education and personal development of young artist does carry expense, but provides immeasurable benefits. The data presented that arts and culture make communities stronger, promote healthier lifestyles, create a more engaged citizen, and generally make the world a better place which serves as proof of programmatic sustainability.

For all these beliefs, sustainability of the performing arts training affects our future lives, and with advocacy, it will continue long after the new careers of tomorrow become obsolete.

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The Importance of Personal Narrative for Sustainable Education in the Performing Arts
Khaye Feygl – Bird of Life

Suan Sunandha Rajabhat University International Conference

Submitted by Jeffrey Marc Rockland, MFA in Dance

Associate Professor and Founding Artistic Director of East Meets West

Kent State University

October 1, 2018

Synopsis – the story of a Jewish dancer/choreographer who after forty years in the profession finds his Jewish voice by creating a dance work that is a gift for his mother’s 80th birthday, and pays homage to his great grandmother, murdered by the Nazis in Poland.

The notion of a bird of life brings to mind many images. In Thailand, when one wishes to perform an act of “merit,” one may choose to purchase a caged bird, and then let that bird go free. Having a little pond behind the home, I share with my Thai wife and children in Hudson Ohio that I am fortunate to be able to observe how birds come and go at various seasons. In fact, these birds regularly remind me of how their lives are in synch with the seasons and their environment. My mother, a successful Jewish artist and author, who showed me how culture connects to humanity before it does to tradition, has always had a special relationship with birds in her art work. Is it just a coincidence that her *bubbie* (Yiddish for Grandmother), my “great-bubbie,” was named Khaye Feygl, which means bird of life? A bird has a chance to fly away just as the birds in my backyard fly away when my dogs come charging and barking. But my great-bubbie did not get that chance to fly away when the German soldiers came to her village and killed all the Jews. Perhaps the only way that my great-bubbie can “fly away” is through the art and dance carried forward in her memory. Perhaps that is why there are so many birds in my mother’s art work, and why it is my duty to create dances that might for a moment feel like flight as homage to one who did not get her chance.

As I near the sixth decade of my life and the forth decade as a dance professional, I find myself wanting to connect to a higher purpose in my creative efforts. As an educator, I am drawn to explore and expose both the dancers I work with and the audiences who view my work, to thought provoking works that strive for social justice and cultural sensitivity. While I still enjoy creating work with the key intention of beauty and entertainment, I am now intrigued with work driven by a personal narrative, or an exploration of life as a journey. After all, it is our personal journey that leads us to grow as artists.

As a child of four, living in Madrid Spain in 1964, I was chosen by David Lean to Play Sasha in the MGM classic, *Dr. Zhivago*. We were a Jewish family living in Franco Spain and I was playing the part of a Russian child caught up in their revolution. As a Jew of Polish and Russian descent now living in America, there has always been a missing part of my sense of identity, a connection to roots. Other than playing the part of a Russian boy in an MGM classic, I lacked any personal connection to Russia or Poland and only the vague awareness that members of my family that did not escape before WWII were murdered there. Having recently returned from a European (i.e., Spain and Paris) vacation followed by a teaching engagement in Punxsutawney, Pennsylvania, I bring back multiple stories of towns, cities and indeed nations where the historical presence of Jews is now sparsely represented by museums, memorials, or the odd plaque.

As a child growing up in Spain, I remember sharing Friday night Sabbath dinners at home and Passover Seders held by Air Force base at Torrejon. At that time, I was not aware of antisemitism. Having lived there from age 3-7 and experiencing a world framed by my father’s employment with the American Embassy, I dare say that I was sheltered from what may have been apparent to adults. When we moved to Princeton New Jersey



and throughout my life since, I have been keenly aware that a portion of the population has negative attitudes toward Jews, something I have since been reminded of throughout my life.

My dancing life began with Israeli and International folk dance at the age of 10. This form of physical expression connected family and my identity as a Jew. It wasn't until I was 17 that I found theatrical jazz dance and then ballet. Classes in ballet partnering soon led me into a career as a professional ballet dancer, spending 19 years of my life with winter seasons of the Christmas classic, *The Nutcracker*. During this time, I welcomed opportunities to dance Mazurka or Czardas sections of classic ballets, such as *Cinderella*, *Sleeping Beauty* and *Coppelia*. Dancing these roles brought back my joy for folk dance and a connection to my Slavic roots, which I knew so little about. Only recently, I have become impassioned, and driven by a sense of urgency to make dance statements that educate my audience and the students I work with toward an appreciation of authentic cultural experience.

Two years ago, when my then 6th grade daughter shared that a student at her school, made a joke about gas chambers after finding out she was Jewish, I was saddened to realize her life would include hurtful moments and comments as mine had. That winter, I embarked on my first choreographed work with Jewish thematic material, but I backed away from making the connection clear to the audience. After my daughter's experience, I felt compelled to create a ballet that helped bridge the familiarity gap for the community we are part of, which has very few Jews. This was my initial idea and then the concept grew until I was planning a work that would be structured around the poems of several different ethnic minority writers. The first poet that I was introduced to was Mathew Lippman, through his book *Salami Jew* (Lippman, 2014).

As I read the poems in this book, I thought that perhaps my initial goal and direction would miss its mark because my audience would not be able to relate to the topics, humor, or imagery. I spoke with Mathew about my dilemma and he directed me toward poems he wrote that dealt with more common mid-life struggles and themes that would be more accessible to my audience. Exploring Lippman's other poems, I found a trio of poems that worked well together. There was no longer a Jewish theme to any of these poems. However, I was collaborating with another Jewish artist (poet), and we were creating a piece that told a Jewish person's story. It so happened that this piece also involved collaboration with a composer in Thailand and a visual artist in Tucson, Arizona. The title was *Peripheral Moments*. It was my first "kind-of-Jewish" choreography after close to 40 years as a dance professional.

The following year, I experienced a new choreographic work by Bill T. Jones titled *Analogy/Dora: Tramontane*, and later the same year, I saw a performance of *Irina's Vow*, directed by Kent State Professor Amy Fritsche. Both works told stories of people who lived through the Holocaust. Seeing these works being choreographed and directed by non-Jews and realizing that the audiences were both emotionally moved and educated, I felt an urge to return to my initial goal of finding my Jewish voice as a choreographer. Next, two things happened that made it impossible for me to walk away from this quest. First, I learned of my daughter having the opportunity for a summer study experience in Poland, the country that my bubbie escaped from; leaving other relatives who could not escape, and were apparently herded into the village synagogue and which was then burnt to the ground with everyone inside. Poland, a country that housed some of the worst concentration camps, was home to 3.5 million Jews before WWII and has approximately 60,000 Jewish citizens today. While there were some Polish heroes who tried to save Jews, this is the same country where violent pogroms were initiated by Poles and resulted in murdering more Jews after the war ended and the Germans were defeated. The same country that now makes it a crime to refer to concentration camps in Poland as Polish concentration camps, and is trying to rewrite history to erase the part Poles played in the murder of its former Jewish population.



Sometimes, we see a play, ballet, or movie, which creates a shift in how we perceive our purpose as an artist. For me, Bill T. Jones’ dance/theatre piece, *Analogy/Dora: Tramontane* had such an impact. Jones is not Jewish, but through his partner of more than 15 years, Bjorn Amelan, he “adopted” a Jewish mother, Dora Amelan. *Analogy/Dora: Tramontane* chronicles events which took Dora as a child from Belgium where she was separated from her parents (who were murdered by invading German soldiers) to Vichy France where she joined the Ouvre de Secour Aux Enfants, an underground Jewish children’s aid society, and ended up helping save the lives of approximately 500 children, whose parents were also taken away and murdered in concentration camps.

When I saw this work performed by the Bill T. Jones – Arnie Zane Company at the Cleveland Playhouse, I was fortunate to take part in a Question and Answer session with the choreographer and artistic staff including dancers and Bjorn Amelan, Jones’ partner and Dora’s son, who also designed the moving sets for this work of dance-theatre. I was so profoundly moved by the story and the fact that a non-Jewish choreographer, whom I have great respect for, choose to create a work telling the story of a courageous Holocaust survivor. The work exposes the different ways people perceive and respond to injustice. During the question and answer session, I was most curious as to how being a performer in the work impacted what was a mostly non-Jewish cast. My curiosity was motivated by my experiences both as a parent raising Thai-Jewish children in a mostly homogeneously white-Christian community and as a dancer having strived to keep connected to my faith despite the demands of my profession. I thought, “if a non-Jewish choreographer can create such a successful work about his mother-in-law’s courageous journey, I could venture to create a work about my mother and her experience as a child of Jewish immigrants in New York during this same period of time.”

During the post-performance Q & A panel, the moderator posed the question, “does thinking about it, studying it, talking about it, make it more likely that someone would stand up against injustice.” Then the panel which included Bill T. Jones, his Associate Artistic Director, and several dancers, were asked if their delving into this material impacted them (Jones, 2016). When asked this, originally Bill T. Jones responded, “that’s probably more of a question for them” motioning to the audience. But the question asked, is one that I asked myself, and later asked the *Khaye Feygl* cast via an anonymous poll was: “Did their interaction with the piece, learning, rehearsing and performing, changed their perspective?” One of the dancers in that panel explained that while he sees an individual’s life and cultural upbringing as responsible for shaping one’s character over time, performing or watching such a piece does become part of one’s experience gained perspective. He also shared how the work required the dancers to become intimately involved with the thoughts and actions of a woman who was courageous and stood up against injustice.

In deciding to write this paper and choosing to choreograph *Khaye Feygl*, I was driven to ask myself: “would I have the courage to expose my Jewish identity so publicly?”, “what did I hope to accomplish?” and “how would I know if I was successful?” As a child, I was taught that all Jews are responsible to perform *tikun olam*, meaning acts which heal the world. The question was how could I create a work that would do my mother justice while sharing a uniquely Jewish experience, accessible to my students and audience? My answers and motivation developed over the course of creating and rehearsing, and continue to evolve and be expressed as I share this work with others. But first, allow me to describe the journey.

As I began to interview my mother regarding her mother, my Polish bubbe, and the plight of our Polish ancestors, I realized that her upcoming 80th birthday provided me with both an opportunity and a deadline. As the interviews progressed, I knew that the title of the piece would actually be the name of my mother's Bubbe, Khaye Feygl. My mother, Mae Rockland-Tupa, a professional artist who has made American Judaica her life’s work and has pieces in the permanent displays of both the New York and the Berlin Jewish museums, became both my subject and my collaborating partner in a work that explores faith, identity, intermarriage and a personal Holocaust tragedy. Inspired by my mother and step-father’s artwork, Bill T. Jones’ ballet and the autobiography



Painted in Words, by artist and Holocaust survivor Samuel Bak, I began the task of recording interviews and building a cohesive story line that would capture this uniquely Jewish story and make it accessible to a predominantly non-Jewish audience (Bak, 2001). Along the way, I was introduced by my mother to the music of Wolf Krakowski, more specifically his rendition of the Yiddish folk song, *Tsen Brider* (Krakowski, 1996).

Tsen Brider dates back to before the holocaust, but there was a version of this song created as a Jewish requiem by Martin Rosenburg in the Sachsenhausen concentration camp just before he and all of his singers were put to death (Jacobson, 2000). The version Krakowski sings is a rockabilly rendition complete with wailing guitars. The history and irony of this song that pokes fun at death is a metaphor of our struggle as artists to make the world a better place.

The ballet represents moments from 1943-1980 and takes place in the Bronx, NY, Glencoe, MN and Brookline, MA. Using sets, projections and an original score that incorporates interviews, some of my own musical compositions and music by Wolf Krakowski, this 17-minute ballet is a story of love that goes beyond religion and is supported by art. It tells the story of a second marriage between a Catholic from Minnesota and a Jew from the South Bronx who meet in Brookline Massachusetts, where they are both artists.

We live at a time when America is going in two directions. We have signs that in some cases diversity, inclusivity and cultural sensitivity are values increasing their place in the American way of life. On the other hand, we have Nazis and the KKK marching in Virginia and acts of hate happening again all over the world. In *Khaye Feygl*, the audience learns how two people from different backgrounds discover each other and build a life that neither of them expected. Choreographing *Khaye Feygl* is an attempt to educate and dispel ignorance. In my small way, this is my *tikkun olam* effort. Decades of assimilation and intermarriage have blended with the results of the Holocaust in creating many environments where the presence of Jews is a memory of a time gone by. While it is a welcome change that Jews are accepted into society most places in the world, there is the bittersweet reality reflected in the often-heard comment: “what the Nazi’s began with the Holocaust continues on through assimilation.” *Khaye Feygl* tells a personal story of my mother, her mother and her bubbie. While reflective of the past, there is also a glimmer of hope that art and creative expression are helping to keep Judaism alive.

How did a ballet titled *Khaye Feygl* (Yiddish for Bird of Life) end up utilizing *Tsen Brider* (a Yiddish folk song that pokes fun at death) for the final scene, a wedding where everyone in the wedding party except the betrothed dies? How did creating this ballet become a catharsis for my need to connect to roots that were made unavailable due to events of the Second World War that cut down our family tree and left us without an “old country” to visit with anything but terror, sadness and dread? At first, I was inspired by plans for my daughter to teach Theatre and English to middle school children in Poland, the homeland where much of my family met their demise. A further sense of purpose came about from my desire to choreograph a work in honor of my mother’s 80th birthday. Then I discovered that my great-bubbie (my mother’s grandmother) came from a village, not far from where my daughter would be teaching.

My intention in creating the ballet was to allow both Kent State student dancers and audience members from Northern Ohio to become familiar with a unique story of a Jewish family and changes which took place over 40 years. Topics, such as the Holocaust, intermarriage and the power of art to transcend tragedy are explored in a narrative driven work set to interviews I conducted with my mother and step-father. History is something one must experience in a visceral way in order for it to shape one’s character as certain experiences do. When we hear about a hate crime in the news, we can so easily turn the page, click on another topic or otherwise divert ourselves from the horrid details. However, when we are forced to live through an experience within a theatrical experience, a film or a dance work, it becomes part of the culture that defines us. In my polling students, I was not surprised to learn that some students felt that the Holocaust was talked about too much. I was also pleased to



learn that more than half of those who participated felt a greater appreciation for and deeper understanding of Jewish culture after their experience learning, rehearsing and performing this work. There are those who deny the Holocaust ever happened and others who look away when confronted with today’s examples of human suffering. When I recall how dancers responded to learning about my family’s personal tragedy and taking part in a dramatic ballet that used personal narrative as the framework, I know that this form of artistic story telling is something that I must continue. While Khaye Feygl never made it out of Poland, examples of needlework that she created were saved and inspired my mother’s artistic passion. A generation later there is a ballet that is named after her and with this, the hope that the bird of life visits us often, reminding us of where we come from and giving us the courage to continue.

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Biography

As Soloist with Atlanta Ballet, Universal Ballet and Les Grands Ballets Canadiens, Rockland danced established repertoire of Balanchine, Bournonville, Feld, Fokine, Najinska, Petipa and Tudor and had new works created for him by choreographers including: Anastos, Bahr, Barnett, Kudelka, McFall, Munroe, Pazik and Taylor Corbitt among others. As Ballet Master for Les Ballets Jazz de Montreal, Rockland was asked to give master classes in cities all over the world. This led to his establishing connections in Asia that many years later have helped build Kent's East Meets West Program. Before coming to Kent State University where Rockland is currently Associate Professor, he was Associate Professor and Director of UNC Dance Theatre within in the department of theatre and dance at the University of Northern Colorado. While in Colorado, Rockland directed this university’s ballet program and was Founding Executive Artistic Director of Colorado Dance Theatre and The Greeley Conservatory of Dance. Working with business partners, Rockland renovated a 10,000-square foot building (now The Conservatory Building) as a center for the arts in Greeley’s historic downtown.



The 80th Anniversary of Suan Sunandha Rajabhat University

“International Conference on Innovation, Smart Culture and Well-Being” (ICISW2018)

8th November 2018, Suan Sunandha Rajabhat University, Bangkok, Thailand



Today, in addition to enjoying his teaching at Kent State, Rockland is a guest teacher for several professional schools including Joffrey Ballet's New York Intensive. This past summer he had guest teaching and choreography engagements with City Ballet of Cleveland, the Mid-States Regional Dance America Conference, Forest Dance and Highlands Ballet.



The Creation of Knew Nah Mah'costume

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ABSTRACT

This article aimed to study the ways of creating Thai performing arts costume for Kaew Nah Mah in the chapter of Kaew Nah Mah's entering the palace edited by Komsorn Thanamethee. The methodology used consisted of documents, picture, video, interviewing and observation.

The findings were that Kaew Nah Mah, the main actress had to change her folk dress into princess's costume since she had to dedicate herself as the princess of Prince Pintong according to his promise. The reason why the unity problems in performance might be arisen whether the main actress gets dressed into the princess's costume decorated with braid as Fine Arts Department's concept was that Suan Sunandha's Thai performance has applied the princess's costume which they created by themselves. It's necessary to create a new costume of Kaew Nah Mah. This creation of the new costume was based on the concept of creating the Thai performance costume. There were unchangeable elements as following: 1) Thai performance costume for female consisting of a cloth to cover her body (i.e., its cloth, a fringe around the edge of cloth and a frame around the cloth), loincloth, necklace, headdress and accessories. 2) The color selection was based on the Principle of Fine Art Department's Color Selection of the main and supporting actors. 3) The material selections to create the costume were adapted for the highest utility; however, the beauty of these costumes was still remained. Other materials available in market were selected to replace the old one as the concept of Fine Arts Department was, and it produced by sewing machine which could reduce time and labor as well as the price and budget to produce these costumes. Moreover, these costumes were light and soft.

Keywords: *Creation, The creation of Thai performing arts costume, The Kaew Nah Mah's costume*

INTRODUCTION

Costume is considered to be one of the important elements in Thai stage performance. It signifies the importance, social position, gender, age of a character and actions that he or she is going to take. The costume used in Lakhon, a traditional Thai dance-drama, is called “Yuen Krueng” which imitates from Thai kings' attire in the past. The costume has been changed and adapted through the period of time. Suan Sunandha's Department of Thai Dancing Art is the organization which creates art performances including precious and exquisite dances and dramas to the society. Moreover, the department has created the “Yeun Krueng” costume for using in the institute's performances. At first, “Yeun Krueng” costume was made for the Lakorn Nok, a play performed by all male, with the title called Yoh Phra Klin in the chapter of “Yoh Phra Klin eats the cat.” The performance was for The Vipitthassana festival, the annual dances arranged by Suan Sunandha Rajabhat University. Later in the following years, “Yeun Krueng” costume was made for other dramas as well. As for the Vipitthassana festival this year, our major has selected the Lakorn Nok called “Kaew Nah Mah” to perform in the event. The reason we have decided to create the costume by ourselves is because Kaew Nah Mah, the leading actress of the play, has not had the costume for her character. If we use the



embroidered Yeun Kreung costume from the Fine Arts Department, it could cause the problem of the unity in the performance as Suan Sunandha’s department of Thai Dances use the customized Yeun Krueng costume. Therefore, it is necessary to freshly create the attire for the “Kaew” character.

The article of Creating Thai Performing Arts Costume for Kaew Nah Mah aimed to seek for ways to create costume for Kaew Nah Mah in the play performed by all male called Kaew Nah Mah in the chapter of Kaew Nah Mah’s entering the palace edited by Professor Komsorn Thanathammethee. The research was done through documents, videos, interviews, and observations

THEORY

1. Principle considerations for costume design concepts are as follow (Virulrak, 2000)

1) Function: A costume has a function in a performance. In designing the costume, clear information is needed to understand how to wear a set or a piece of the costume, for which characters and for what purpose.

2) Pattern: A costume must be designed corresponding to the genre of the performance, backdrops and the overall atmosphere for the unity of the play. Mood and characteristic of characters are also needed to be considered for creating a proper design.

3) Characteristic of a character/performer: Each character has a unique characteristic. A character’s status can be indicated by a costume. Physical appearances of the performers should also be considered for the proper design for each person.

4) Creation: Materials and structure are the two important elements which are needed to be considered for a costume creation.

4.1) Materials: A costume is made of various materials. People do not often use authentic materials for costume making as they can be expensive and heavy which could be an obstacle for performing. Therefore, artificial materials are applied with some technical helps to make the materials look similar to the genuine ones.

4.2) Structure: The structure can be divided into three types according to its function. The first type is the ready-to-wear clothing which each part is attached in one dress, making it easy to wear. The second type is the semi-ready-to-wear clothing which some parts are separated from the dress, but it is not difficult to wear. The third type is the split clothing which every part of the costume is detached. A performer must wear the attire piece by piece which might cause some difficulties in costume wearing.

5) Costume Changing: In some performances, a costume is needed to be changed in each scene corresponding to the situation in the play. The convenience and quickness in costume changing are needed to be considered in designing costumes.

6) Cost Effectiveness: Costumes investment is costly. Therefore, it is necessary to be circumspect and economical in designing costumes (Virulrak, 2000).

2. The concepts of work creation have mentioned the creating process, stating that principle considerations in creating new items are as followed:

1) Misplacing to be different from a previous perception: Misplace a position, shape or outline, alternate different colors or different functions.

2) Decoration and adaptation: The ideas are about adapting the work to be suitable for a space and time. Modifying the original ideas to create better outcomes is also considered as a creation. It is the creating process which always surprises audiences because they are not familiar with the work or they do not expect to see the changes (Vechsurak, 2004; Sutthiphon, 1980). In order to modify or create new forms of work, a creator must not only hold a different thinking process, but also needs to consider the principles and correctness of each genre of an artwork. From the mentioned concepts, the researcher has brought them into consideration to seek for ways for designing and creating a costume for Kaew Nah Mah.



RELATED WORKS OR DISCUSSION

The Fine Arts Department (2004) has conducted the research on “Costumes in Drama and The Development: “Yuen Krueng” costume in plays performed by all females by the Fine Arts Department.” It is a descriptive research using history research methodology with the purpose to study the history and background of Thai drama costumes from Ayutthaya period to Rattanakosin era. The research focused on the evolution and development of the costumes in the plays performed by all females by the Fine Arts Department. According to the study, it was found that “Yuen Krueng” costume in the plays performed by all females was developed from the royal attire of the king and then it was adapted appropriately to the social context.

The Fine Arts Department (2007) has conducted the research on “The Study And The Knowledge Development of The Costumes in Thai Classical Masked Play And Thai Dance Drama.” The research emphasized on the study of the historical background and the changes in Yuen Krueng costume’ patterns from the ancient era until the present time to analyze and discover the patterns and fundamental features in creating Yuen Krueng costume for the Department of Fine Arts. It was found that the Department of Fine Arts’s Yuen Krueng costume was influenced by the Department of Amusement.

Naowarat Thepsiri (1996) studied the costumes of the main actors and actresses in the Thai dance drama (from 1985-1996). The research aimed to study the changes in the costumes of the main actors and actresses in Thai dance drama in Rattanakosin era from the period of King Rama 1 until the 50th year in the period of King Rama 9 (1985-1996). The study has found that the changes occurred in conformity with the social context in each period.

The research team has analyzed the mentioned information to discover the structure of Yeun Krueng costume in order to use it as a guideline in creating the costume for Kaew Nah Mah.

Wuthichai Khathawee (2016) has done the thesis with the purpose to study the development, creating methods and how to wear the Yeun Krueng costume in Suan Sunandha’s plays from 2006 – 2015. It is a qualitative research studying through documents, interviews and observations. The data was then analyzed according to the research purpose. The result showed that Suan Sunandha’s Department of Thai Dance has created the costumes to solve the problems namely the cost and the duration in costume making. Suan Sunandha’s costumes are lightweight, convenient to wear, and multi-purpose.

The research team has analyzed the mentioned information to uncover the concept of using alternative materials to make it as a guideline in creating the costume for Kaew Nah Mah.

METHODS

1. Data Collection

1.1 Document Studying: The historical background information of Thai drama costumes, Yuen Krueng costumes for Suan Sunandha’s plays, and the importance of the Kaew Nah Mah character from academic papers, books, textbooks, researches from different places and institutes were studied.

1.2 Interviewing: The main interviewees from academic experts and personnel in the field of Thai dancing art who are relevant in creating Thai drama attires and Yuen Krueng costume for SuanSunandha’s plays were selected by the researcher.

2. Research Instruments

2.1 Interviewing form for the experts related to Kaew Nah Mah costume creating

2.2 Observation form for the experts related to Kaew Nah Mah costume creating

3. Data Analysis: The data was analyzed by the researcher according to the following steps

3.1 Data Management: The data based on the objectives was categorized.

3.2 Research Interpretation and Conclusion: The accordance and differences of the acquired data from the data management were considered. In addition, a report on the conclusion and interpretation



according to the designated research concept framework objectives was made.

3.3 Qualitative research results conclusion: The results from the research findings were described.

4. Verification of Data Reliability: The accordance and differences of the data from various sources such as time, places and people were considered.

RESULTS

Kaew Nah Mah was the main female character in the Thai drama of Kaew Nah Mah. In the chapter of Kaew Nah Mah’s entering the palace, Kaew had to get in the palace to offer herself to be a wife of Pintong, the prince, according to the promise that Pintong made when Kaew collected his kite and returned it to him. Originally, Kaew was a commoner living with her grandparents in the hut at the edge of a forest. She dressed up in the same way as the locals wearing loincloth with a full-sleeve blouse without any accessories. When Kaew Nah Mah had to enter the palace, according to the tradition of Thai drama, an actress acting as a wife of a king had to dress up in Yuen Krueng costume. Kaew Nah Mah’s costume creating had divided into 3 parts as followed:

1. Siraphon (Headdress)

Siraphon is a head decoration. It was not newly designed. The Silaphon in the same pattern as that of the Department of Fine Arts was used. It is a showing face mask in the shape of a facial part of a golden horse.

2. Thanim Phimpaphon (Ornament)

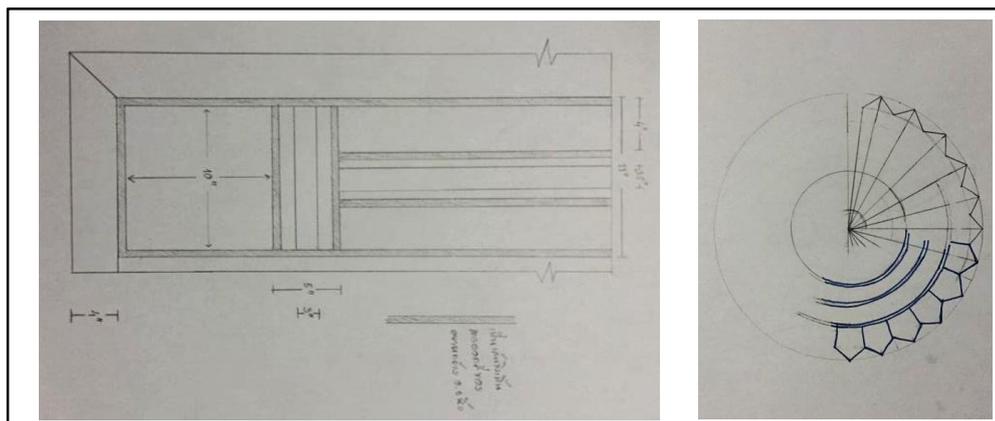
Thanim Phimpaphon is body decorations consisting of Chi Nang (a breast plate), earrings, Pawalum (a bracelet), bracelets, a belt with its buckle, and anklets. These accessories were not newly designed. The same accessories as those of the Department of Fine Arts were used. They all are made of gilded metal decorated with diamonds and gems.

3. Pastraphon (Silk Costume)

Pastraphon is a costume made from textile. For Kaew Nah Mah’s costume, it consists of Sueanainang (a sleeveless shirt), Panung (a brocade worn as a long skirt), Pahomnang (a large clothe worn as a scarf) and Krongkho (a necklace). The patterns of Suea nai nang (Underwear) and Panung (Cloth) were not newly designed or changed. They were still in the same design in accordance with the Department of Fine Arts. Sueanainang is a sleeveless, hip-length shirt, open in front. Panung is a Yarrabub clothe imported from India. For Pahomnang and Krongkho, they needed to be newly created. The creating guidelines were as followed:

3.1 Structure

The structure of Pahomnang and Krongkho in Yuen Krueng costume was mostly fixed. To illustrate, Pahomnang’s structure was in a rectangle shape, divided into 2 sides which were the left and the right side. Pahomnang consisted of a piece of cloth, Kliphob (trimmed edge), and Krobcherng (a pattern frame). Pattern lines similar to Kliphob could somehow be added in the center of the fabric in both left and right sides. For Krongkho, the structure was in a circle shape. The Krongkho’s edge could be plain or wavy. The designs of Kaew Nah Mah’s Pahomnang and Krongkho could be seen in the following picture.





Picture 1: The estimated draft of Kaew Nah Mah’s Pahomnang and Krongkho
Source: Research Team

3.2 Color Selection

Kaew Nah Mah was a leading actress in the drama. There was no fixed color for her costume. Therefore, the color could be freely selected. However, the appropriateness was still needed to be considered. According to the Department of Fine Arts, using color for costumes of leading and supporting characters had been indicated to “dress correspondingly to the tradition. Costumes’ colors were determined by the primary colors. To illustrate, the costumes for the leading actor and actress were in red, green and yellow. For the supporting characters, the costumes were in secondary colors, namely pink, blue and yellow (The Department of Fine Arts, 2007). Therefore, the costume for Kaew Nah Mah should be red because it was the first primary color for the main character in the drama. In addition, Pintong character wore designated yellow attire. When the main actor in yellow costume and the main actress in red dress were in the same scene, the colors were contrast according to the costume color management in Thai drama. Once red was selected to be a primary color, the colors for each part were as followed: the piece of fabric in Pahomnang was red, Klipkrob was green, Krobcherng was frequently in the third color that contrasts with red and green; therefore, the yellow color was used. Krongkho and Panung were in green color.

3.3 Materials

For materials selection, it was separated into two parts which were the fabric and decorating materials.

3.3.1 Fabric: Normally, the Department of Fine Arts’s Yuen Krueng costume uses a plain cloth without pattern on it. Each part of the fabric is attached using a large embroidery frame. Draw the preferred pattern on the fabric. Then use various kinds of metallic threads to stitch on the drawn pattern. This process had to be handmade. Therefore, creating Yuen Krueng costume each time took a lot of time and expenses. For Kaew Nah Mah’s costume making, concepts of time-saving and cost-saving were considered. Consequently, a fabric with pattern on it was used as a main cloth for Pahomnang. Klipkrob, Krobcherng and Krongkho were made of plain-colored, but shiny and glittery fabric. The artificial materials mocking up market products were used as a decoration.

3.3.2 Decorating Materials: It was a material to substitute the metallic threads. Ready-to-use materials were expected to be applied. They could be placed on a fabric to form a pattern. Ready-to-use materials were namely Khaek lace, which was similar to weaved plastic lines in different sizes and patterns, embroidered ribbon lace, sequins, beads, crystals and diamonds. Most of these materials could be embroidered using stitching machine. Only some of them needed to be human made, but it still took less time than creating Yuen Krueng costume in the same style as the Department of Fine Arts. Besides, these materials were quite much cheaper than metallic threads, and they were lightweight as well.





Picture 2: Decorating Materials which can be found in a market

Source: Research Team

CONCLUSION AND FUTURE WORK

The article of Creating Thai Performing Arts Costume for Kaew Nah Mah aimed to seek for ways to create costume for Kaew Nah Mah in the play performed by all male called Kaew Nah Mah in the chapter of Kaew Nah Mah’s entering the palace. From 2009 onwards, Suan Sunandha’s Department of Dancing Art has created its own Yuen Krueng costume. Therefore, the reason to recreate the costume for Kaew Nah Mah was due to the fact that a costume for this character was not available, and a unity in a performance was needed. In making Kaew Nah Mah’s costume, some elements, such as Siraphon, was in the same pattern as that of the Department of Fine Arts. It was a showing face mask in the shape of a facial part of a golden horse.

For Thanim Phimphaphon, the decorations were Chi Nang (a breast plate), earrings, Pawalum (a bracelet), bracelets, a belt with its buckle, and anklets. They were all made of gilded metal decorated with diamonds and gems. Also, some Pastraphon were in the same pattern as those of the Department of Fine Arts such as Suenainang, a sleeveless shirt, open in front and Yearrabub Panung, a cloth imported from India. Elements which were recreated were Pahomnang and Krongkho. These elements were adapted from the original structure. Some ready-to-use materials were applied namely Khaek lace in different patterns and sizes, embroidered ribbon lace in various patterns, sequins and beads. These adaptations were considered to be a way of creating new pieces of artwork by using the ancestors’ knowledge without destroying the original ones.

When the costume was created, it was expected to be lightweight and cheap. Additionally, it saved time, reduced human force, and could be used in various purposes. This costume making was considered as creating new work from the old one. The knowledge from the previous work was applied by taking the structure of thread embroidered costumes from the Department of Fine Arts as an example. Then, instead of using metallic threads, substituted materials were adapted. Therefore, costume creating could depend more on machines and less on human forces.

Suan Sunandha’s Department of Dancing Art is an educational organization which does not only produce quality graduates, but also create dramatic performances. Both are conservative and creative to the society, based on traditional knowledge inherited through generations. This costume creating is considered to be another product from the intellect, creative thinking process, physical forces, mental supports and the helps from the staff in Suan Sunandha’s Department of Thai Dances in creating the work which responds to the requirements and the greatest advantage. It is also knowledge in developing the work for the future and cumulates the intellectual skills for students to be able to work effectively in a broader society. When the Thai dancing organizations are able to combine all the elements together, namely budgets, strong and knowledgeable staff as well as appropriate occasions, Thai dancing art can be developed and continue to last sustainably in the society.



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The Transformation of Hun Krabok Puppets from Central Thailand to Northeastern Thailand

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ABSTRACT

This research aimed to study the transformation of puppet show in the central Thailand to the puppet show of northeastern part through the tropes Rodsirinilsil and Petchnongrue. The research methodologies included documentary, field data collection and interview.

The results were presented as followd: 1) While Rodsirinilsil troupe applied stories from Thai traditional literatures, plots of Petchnongrue troupe were mainly adapted from Northeastern folklores, and added some jokes to the stories. 2) Rodsirinilsil's body of puppets were similar to that of the Thai royal puppets, while Petchnongrue troupe makde its puppets much more simple by using accessible materials such as plastic pipes. 3) Although Petchnongrue troupe adapted its costumes from costumes used in a Central Thai puppet show, the troupe makde them more casual according to a simple way of life of people in the Northeastern region of Thailand. 4) While Rodsirinilsil troupe used only Thai musical instruments in Thai traditional music ensemble, some western musical instruments and Isarn local instruments weree integrated in the shows of Petchnongrue troupe. 5) While Rodsirinilsilp troupe's stage props were exquisite artworks which were similar to what appeared in Thai murals, some gadgets in everyday life (e.g., cell phones) were used in shows of Petchnongrue troupe. 6) The Rodsirinilsilp troupe's puppet theatre looked like a performing stage of Thai royal dance drama while the theater of the Phet Nongrue troupe was relatively similar to a 'Mor Lum' (local folk performance) stage. 7) The movement of the puppets in a show of Petchnongrue troupe was more similar to human movement, unlike Thai classical stylized movements of the Rodsirinilsilp troupe.

In conclusion, the transformation of characteristics from Central Thai Puppetry (Rodsirinilsil troupe) to the northeastern one (Petchnongrue troupe) signified the transformation from Thai central “dance theatre” (i.e., lakhon Nok) to northeastern local performing arts. The shows of Petchnongrue troupe also reflected the simplicity, fun-loving, and the cultural openness of people in the Northeast of Thailand.

Keywords: *Transformation, Puppet Show, Northeastern Thailand, Central Thailand*

INTRODUCTION

Puppet show is a performing art that uses puppets to communicate with audiences. Thai puppet show was originated in the reign of King Rama V, when Mr. Neng, a Sukhothai native, imitated and adapted Hainanese puppetry into the Thai style (Wirunrak, 2006). In 1893, the first puppet troupe was set up in Bangkok by Mom Rajawongse Tho, a chamberlain of HRH Prince Damrong Rajanubhab (Posayakrit, 1986). Therefore, at that time people generally called Thai puppet show as “Hun Khun Tho.” Later, the name was changed to “Hun Krabok” because the trunk of each puppet was made of a small bamboo rod, called “Krabok” in Thai. The head part represents the role and character of each puppet. The body, legs, and arms of the puppet are normally covered by decorated costume.



Figure 1: Thai Puppet

Hun Krabok had been increasingly performed and become widely popular. One of the most famous puppet troupes in the central part of Thailand was the Rodsiriniilsilp troupe that was established by Mr. Boonrod Prakobnil (who was already deceased). During his childhood, Boonrod liked to watch Hainanese puppetry and the puppet show of Mr. Piak Prasertkul’s troupe. He was subsequently trained to be a puppeteer, and finally had a chance to perform on the same stage with Mr. Piak, Khun Yai Wha, and Khun Yai Chuen Prasertkul. Boonrod wanted to create his own puppets because he was a skillful craftsman in applying gold leaf to glass. Thus, he set up his own puppet troupe, and named it as Rodsiriniilsilp, which was also known as “Hun Boonrod.” After Boonrod’s death, the Rodsiriniilsilp troupe was passed down to Mrs. Korakot Mongkholsilp and Mrs. Saisamorn Thongphueag (Maicharoen, 2009).

While Hun Krabok was widely performed in the central region, there was still no puppet show in the northeastern part of the country. The first pioneers that saw the puppet show of the Rodsiriniilsilp troupe and decided to create the northeastern puppets were Mr. Suan Phongphaew and Mr. Sangwal Phongphaew. Before establishing the puppet troupe, both of them used to be Nang Talung puppeteers. They once went to perform the northeastern Nung Talung at Suan Amphorn’s Loy Krathong Festival in Bangkok, and saw the puppet show of Mr. Boonrod Prakobnil’s troupe. After returning home, they used their imagination to create their own puppets based on the puppet show they had seen. In 1985, their northeastern-style puppet show was performed for the first time in the Nongrue village, Nongrue District, Khon Kaen Province by the Phet Nongrue troupe, where Mr. Suan was the troupe’s leader and Mr. Sangwal was the troupe’s manager (Yuencheevit, 1996).

It could be said that the Phet Nongrue troupe was inspired to develop its own puppets by the puppet show of the Rodsiriniilsilp troupe. The key elements of the central region’s puppet show were adapted to create the northeastern-style puppet show. For example, the trunk of northeastern puppets was made of bamboo rod, which was the same as that of the central Thai puppets. However, the northeastern-style puppet show clearly used different music, rhythm, and instruments. In terms of costumes, the costume design and fabric were modified to present the simple way of life of the northeastern people in an aesthetic fashion.





Figure 2: Central region’s puppet show of the Rodsirinilsilp troupe
Figure 3: Northeastern-style puppet show of the Phet Nongrue troupe

The researcher was interested to study why, and in what ways, does the creator of the northeastern puppet choose to modify and maintain certain elements of the central Thai puppet. Thus, this research aimed to examine and analyze the transformation of the central region’s puppet show of the Rodsirinilsilp troupe into the northeastern-style puppet show of the Phet Nongrue troupe. The findings of this research will be helpful in creating and perceiving the performing arts as the cultures that can flow, link, and depend on each other.

RESEARCH OBJECTIVES

1. To study the transformation of the central Thai puppet show into the northeastern-style puppet show.

SCOPE OF THE STUDY

1. Regarding the scope of content, the present research intended to study the performing elements, including stories, puppets, music, stage props, theatres as well as sets, and puppet manipulation of the puppet shows of the Rodsirinilsilp and Phet Nongrue troupes. Only the most popular puppet show story of each troupe would be selected to study.
2. The target population of this research was the experts with direct knowledge and experiences in performing the puppet shows in the central and northeastern parts of Thailand that could be divided into two groups: 1) academics and 2) puppeteers and related staffs.
3. The study area included two puppet troupes in the central and northeastern parts of Thailand, namely the Rodsirinilsilp troupe in Bangkok and the Phet Nongrue troupe in Khon Kaen.

RESEARCH METHODOLOGY

1. The data from related documents, textbooks, books, and previous research were collected to be used in the analysis process.
2. The structured interviews and observations were carried out to collect data from the key informants. All the questions were predetermined by the researcher with the aim to investigate the transformation of the central Thai puppet show into the northeastern-style puppet show. The researcher went to interview the key informants, and carefully recorded all information before analyzing the data and presenting the results in the next steps.
3. The obtained data were classified using the descriptive analysis technique based on the research objective. The data from the interviews and the related documents and research studies were thoroughly analyzed in order to obtain the results according to the research objective.

RESEARCH RESULTS

The research results concerning the transformation of the central Thai puppet show of the Rodsirinilsilp troupe into the northeastern-style puppet show of the Phet Nongrue troupe could be described based on the performing elements as follows.

1. Performing Stories

The repertoire of the Rodsirinilsilp troupe included plots adapted from the central region’s novels, literature, and folklore such as Phra Aphai Mani, an epic written by Sunthorn Phu, and Yor Phra Klin, a traditional central Thai folk tale. On the other hand, the most popular puppet show story of the Phet Nongrue



troupe was “Winyan Rak Nang Phidip,” which was adapted from “Krai Loka,” a famous northeastern Nang Talung story (Nang Pramothai). The content of this story was modified to suit the superstitious beliefs of the northeastern people. In terms of lyrics, the Phet Nongrue troupe composed new poetic lyrics in the Khon Kaen Mor Lam style which is northeastern uniqueness. The title was also changed from Krai Loka to Winyan Rak Nang Phidip to clearly reflect the local nature of this performing art form.

2. Body of the Puppet

The Rodsirinilsilp troupe used the resin casting technique to create the head part of puppets, as this technique could produce puppets’ heads of the same size and pattern in a timely and convenient way. The arms of each puppet were made of a long slender wooden stick, called Mai Takiap. The hands were made from resin, and beautifully modelled in a Tang Wong gesture or a clenched fist holding a weapon. The appearance of the Rodsirinilsilp troupe’s puppets was similar to that of the Thai royal puppets. On the other hand, the Phet Nongrue troupe created puppets based on the story that was selected to perform. The Phet Nongrue troupe’s puppets looked simpler than the puppets of the Rodsirinilsilp troupe. The body of each puppet was soft like a doll because it was stuffed with cotton. The Phet Nongrue troupe did not focus on the beauty of Thai classical dance like the Rodsirinilsilp troupe did. However, it placed importance on wood carving which is the local wisdom of northeastern artisans.

3. Costume

The Rodsirinilsilp troupe applied Thai painting patterns, such as Dok Chik and Kakabad, to create the costume of puppets. The costume was delicately created and elaborated just like the costume of the hero, heroine, and giant in Thai dance drama. In contrast, the Phet Nongrue troupe did not follow the costume standard of Thai court drama but focused more on using local clothes. Local accessible materials were applied to create the puppet costume and accessories such as crown toys that were sold in local markets. A clown puppet was locally dressed like a Mor Lam singer in the northeastern region.

4. Music

In terms of musical instruments, the Rodsirinilsilp troupe only used Pi Phat Khrueng Ha, a kind of Thai classical music ensemble, without adding any non-Thai instrument. It reflected that the troupe strictly complied with the music pattern of Thai classical dance. On the contrary, the Phet Nongrue troupe applied a variety of western instruments, such as guitar and keyboard, to create a modern atmosphere and entertain audiences in a more flamboyant manner. This indicated that the Phet Nongrue troupe could adapt and adjust the musical element to contemporary lifestyle.

5. Props

The Rodsirinilsilp troupe’s stage props were considered exquisite artworks made from imagination, similar to what appeared in Thai murals or classical art. Meanwhile, the Phet Nongrue troupe did not take account of Thai classical art. It focused on using accessible materials to create stage props. This was probably because each performing story of this troupe was already adapted to suit the modern daily life of the audiences. For example, the troupe cut plywood into a motorcycle shape and then painted it to look like a real one. The simplicity of each stage prop reflected the simple way of life of the northeastern people.

6. Theaters and Sets

The Rodsirinilsilp troupe’s puppet theater looked like a performing stage of Thai royal dance drama while the theater of the Phet Nongrue troupe looked like a local Likay stage with the troupe’s name on the backdrop. The sets were modernly made from vinyl. Interestingly, there was an advertising banner attached to the set, which was considered a smart way to combine marketing with a work of art.



7. Puppet Manipulation

The Rodsirinilsilp troupe strictly adhered to traditional puppet manipulation techniques. In order to make puppets move in delicate gestures, the puppeteers needed to seriously concentrate on the manipulation, have knowledge in Thai classical dance or drama, and continue to practice manipulating puppets until they were highly skilled. As for the Phet Nongrue troupe, the manipulation techniques were simplified and easier. Each puppet was freely manipulated to move like a human without complying with the pattern of Thai classical dance movements.

DISCUSSION

1. The puppet show of the Rodsirinilsilp troupe adopted simplified forms of dance theatre [Lakhon Nok], while the north-eastern troupe, Phet Nongrue, focused more on appealing to local community using “Mor Lum”, local stories and arts including shadow puppets. As such, the puppet show of the Rodsirinilsilp troupe imitated the movements and patterns of Thai dance theatre, whereas the Phet Nongrue troupe transformed the central Thai puppet show into a form of folk art that represents the identity of the northeastern way of life. For example, the face of each puppet was exquisitely made according to the ideal beauty of Thai dance theatre’s character. The hands of each puppet were beautifully modelled in a Tang Wong gesture. The puppet costume was also elaborately made like the costume used in Thai classical dance theatre.

2. The puppet show of the Phet Nongrue troupe reflected the uniqueness of the northeastern way of life. The troupe created puppets, costumes and related accessories from local materials available in nearby shops and markets showing the simple lifestyle of the northeastern people. Moreover, worn-out mobile phones were also used as the stage props in the Phet Nongrue troupe, which indicated an economical way of life and creativity of the northeastern people in reusing wastes to create added value to the puppet show. The Phet Nongrue troupe did not adhere to any theatrical pattern like the Rodsirinilsilp troupe did. It freely created its own puppet show by combining the Rodsirinilsilp troupe’ performance style with indigenous elements that could clearly present the local lifestyle of the northeastern people.

It could be seen that the Phet Nongrue troupe placed importance on the local identity. The northeastern clothes were used, and adapted to create funny and interesting puppet costumes. The troupe made the puppets wear beaded accessories and vests in order to attract the attention of audiences, although local people were unlikely to wear that kind of clothes. On the contrary, the Rodsirinilsilp troupe strictly complied with the traditional practices of Thai classical dance.

3. The adjustment and changes carried out by the Phet Nongrue troupe made the northeastern-style puppet show survive. At present, the Rodsirinilsilp troupe no longer appears on stage while the Phet Nongrue troupe can go on performing puppet shows due to its ability to adapt to current situations and respond to modern needs. Thus, it can be concluded that a traditional work of art may possibly vanish, if there is no adaptation and transformation. On the other hand, if the adaptation and transformation are excessive and have no clear standard, that work of art can be easily destroyed rather than preserved.



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The Role of Emotional Intelligence in Sustainable Transportation Design

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ABSTRACT

Recent developments in transportation design increase adaptation of technology to human nature. The sustainable transportation design should become spotlight in order to better address on smart culture and human wellbeing. Hence, Emotional Intelligence (EI) through User Experience (UX) and User Interface (UI) will take the role to make sure it will embark the sustainable issues in transportation design by focusing on social development without compromising economic and environmental factors. The document review on sustainable transportation and emotional intelligence were explored to find the gaps and connection contribution between design and sustainable in this research by looking to the emotional intelligence implementation in the concept car development. Then it used to conduct small workshop among 10 transportation designers to know their perspectives, and come out with the construct by using Repertory Grid Technique (RGT), where participants compare objects describing properties that they find to be significant. All participants realized the role of emotional intelligence for the better future, and contributed to minimize sustainable transportation issues. Finally, the analysis on the RGT data highlighted six of the most influential concept cars that represented thematic categories through emotional intelligence. The results concluded the role of emotional intelligence could be seen as a new dimension, as a bridge to technology, and it contributed to human life.

Keywords: *Emotional Intelligence, Sustainability, Transportation Design, User Experience, User Interface*

INTRODUCTION

Understanding the growth of interest on sustainability leads to the query on how this issue were observed and discussed as well as how far it has already solved as the topic has become popular in research world since many years ago. Similarly, the sustainable transportation studies, many papers, books and reports have been published even till now because communities realized that human activities have significant ecological impacts that can urge economy, society and environment (Litman & Burwell, 2006).

The typical examples of these impacts which have often been discussed were the exhaust emissions from petrol and diesel engines due to the carbon monoxide, nitrogen oxides, sulphur oxides, hydrocarbons and particulate matter (Zuidgeest, Witbreuk, & van Maarseveen, 2000). Other than air pollution (Gossling, 2013; Domanovsky, 2014), the congestion also highlights the traffic safety that impacts majority of pedestrians, cyclists, motorcyclists and other kind of drivers who spend hours to reach their destinations (Miranda & da Silva, 2012; Kiss, 2014).



Based on Opdam (1994), normally, the results of these studies will encounter with the conclusion that it is urgent to improve fuel efficiencies, boost traffic control, reduce emissions and promote public transport. Zuidgeest, Witbreuk and van Maarseveen (2000) believe there is nothing wrong with this conclusion, but it shows that most literature deals with the environment indicator compare to economic and social. There are already many views on sustainable transportation like this that very descriptive and general, and it is often focused on outcomes rather than the process (Black, 1996). Meanwhile, Haq (1997) stated that the growth of motorization produces noise that disturbs mood, and reduces the performance of the cardiovascular system which indirectly impacts intellectual and mechanical tasks especially while driving. This could contribute to road accident cases, and endanger to human life.

The situations indicate the connection between human and emotion with the surrounding that could contributes to the community development in sustainable transportation design through social concern. Because of that, this paper try to highlight design perspective on sustainable transportation by focusing more on social contribution and not forgetting economic and environmental attributes through implementation of User Experience (UX) and User Interface (UI) as Emotional Intelligence (EI).

LITERATURE AND THEORY

A large number review of the literature proposes that national authority concerned with sustainability issues at the universal scale like global climate change. It also has extensive reviews on sustainable transportation that generally cover huge sustainable issues; however, it is still difficult to find any review that specifically studied or focused on any indicators and perspectives from any fields of design. Hence, to identify literature review on sustainable transportation design, the sustainable transportation and design approach are combined to have a tremendous meaning about it.

Sustainable Transportation Definitions

Definition of sustainable still been discussed in many literatures since there is no universal understanding on sustainability, sustainable development or sustainable transportation (Beatley, 1995). It is vital to differentiate on what aspects we need to highlight by taking into account the interdependence among urban areas, transportation division and sustainability (Zegras, 2006). The most influential definition on sustainable development was the one accustomed in 1987 by The World Commission on Environment and Development through Brundtland Report that defines it as a development that meets the needs of the current situations without compromising the capability of future generations to achieve their own demand. Then, Transport Canada (1997), Black (2005) and Sustainable Development Commission (2011) commonly embrace that definition as theirs. This sustainable development has been seen in numerous studies on how it established, deep review of existing approach, efforts and using many variety ways to categorize a large field to contribute has been done like in Eichler (1995), Benton (1996), Castro (2004), Rogers (2008) and many more.

Since 22 years ago, OECD (1996) believes that there had been extensive research on defining and discerning for sustainable development, but it was comparatively insufficient on sustainable transportation. However, in recent years the landscape of sustainable transportation has diverged into various definitions, such as Black (2005), Hall (2006), Litman and Burwell (2006), Jeon et. al (2007), Oregon Department of Transportation (2008) and FHWA (2011). Hence, the lack of research on sustainable transportation definition that argued by OECD (1996) is no longer being the main subject to be focused on. In current scenario, finding mutual agreement on universal definition and versatile approach in sustainable transportation was more concentrated.

Among all discussions, Zhou (2012) has executed some of sustainable transportation definitions since 2000. This is the most effective content to see the whole picture on how researchers define sustainable transportation since past decade;



Current approaches for Sustainable Transportation Design

UNESCAP (2015) and Neyestani (2017) design believed on this three main current approaches; Avoid, Shift and Improve to achieve sustainable transportation design. In Figure 3, Avoid approach seeks to evade unneeded trip, and scale down the travel distance where the authorities involve in developing well-plan area. The shift approach concentrate on encouragement of using more public and non-motorized transport while improve approach focuses on enhancement transport practices and technologies.

Figure 3
Current approaches in sustainable transportation design by UNESCAP (2015); Nayestani (2017)

<ul style="list-style-type: none"> • Reduction of transport demand 	Avoid
<ul style="list-style-type: none"> • Promotion of more efficient energy and environmental friendly transport modes 	Shift
<ul style="list-style-type: none"> • Improvement in efficiency of the transport process • Introduction of new technology 	Improve

Based on Figure 2 and Figure 3, this theory leads to the essential of new approach that could contribute to fill the gap of social development by consideration of the current approaches in sustainable transportation design by UNESCAP (2015) and Nayestani (2017). Hence, it is the beginning for the role of emotional intelligence, which propose in this study as a new dimension to look sustainable transportation design and embark the equity, human health, community livability, cultural and historic values through two approaches; the shift to more efficient energy, and to improve transport design process with implementation of new technology.

RELATED WORKS OR DISCUSSION

The implementation of technology in human nature is the key concern of uuman factor, ergonomics, human computer interaction and usability engineering (Hessenzahl, 2007) However, this key concern was often seen barely in terms of perceptual and cognitive processes and the ability to perform with efficiency that really close with design perspective. This conceptual and cognitive process values the technology in human life as a tool for pleasurable concern. This advancements show that emotions are an integral part of rational thinking and decision making (Locwenstein & Lerner, 2003). Norman (2014) highlights emotion design that it has greatly affected the way product created in his revised and expanded edition on *Design of Everyday Things* book. While the goal of engineering to conquer the artificial intelligence (Barbara et. al, 1998), this study would propose emotional intelligence as design goal since intelligence is not only intellectual, but also consists of people skills which are vital as the traditionally recognized cognitive skills Furthermore, by a great implication, machines might also have similar good use of emotional intelligence (Goleman, 1998).

Emotional Intelligence = User Experience (UX) + User Interface (UI)

Emotional Intelligence term first appeared in 1964 paper by Michael Beldoch, and gained popularity in the 1995 book of emotional intelligence by Daniel Goleman. Even at the early stage the Goleman (1995)



analysis on emotional intelligence widely been criticized within scientific community, it then has prolific reports of its usefulness and being used widely in business school and psychology area. Among all definitions and models in emotional intelligence, this study retrieved the Goleman model (1995), Salovey and Mayer (1997) conception that defined it as the ability to monitor own and other’s emotions including perception, using, understanding and managing emotions, it then is brought to the digital world as Figure 4 to utilize it in design perspective.

Figure 4
Goleman Model (1995) and Anne Gibson Illustration (2013)



According to Epstein (1994), there are two modes of information processing including experiential and rationale mode. Of the two, the experiential mode is driven by emotions and it provides more rapid processing and decision making than the rational mode. The result from the study shows that this experiential mode is easy to understand through experiencing and interfacing of user with product. This view also supported by Gkouskos and Chen (2012) who believed this knowledge that the necessity to consider an emotion is evident in order to create pleasurable experience for the user. They also highlight the successful of product depends on holistically connection between user and product. These understanding represent how emotional intelligence could be seen in design approach by implementation of user experience (UX) and user interface (UI).

Concept Car Development

In order to focus on sustainable transportation design, and explore the design perspective, the design styling practice in any transportation industry is fundamentally concerned. As the preliminary study, the automotive industry is the area that closes to sustainability and society. Based on Clement and Porter (2006), automotive design considers how interpretation of aesthetics during the product development of an automobile. This consideration extends to all areas of the product readily visible to the customer (e.g., metal, glass, wheels, lamps, mirrors, grilles, badges and other adornments on the exterior) as well as all visible soft trim (e.g., seats, door trims), instrument panel and controls (e.g., steering wheel, switches, radio console) and other parts on the automobile interior. Automotive design generally considered to be one of the most powerful contributors towards the branding and marketing of the vehicle. At the same time, automotive manufacturing is also concerned towards sustainable transportation issue. Hence, various concept vehicles that meet the future demands are being developed. However, due to the matter of secrecy and confidentiality set by automotive companies, catering information has been difficult for academic researcher. Due to this, only a few references could be found, unless one has to venture into the company itself. All in all, this study attempts to approach automotive designers to seek their point of view on this matter will be elaborated more on methodology.



METHODS

Based on document review, in order to achieve research objective for this paper, RGT design and execution of future workshop method has been used. The RGT (i.e., repertory grid technique) is originally come from personal construct theory (Kelly, 1955) where it is actually a form of human cognition theory. The primary prediction revolves around an individual’s thoughts and understanding of the world which is made up of dimensions of differences and similarities that is normally called as a personal construct. These are formed via the comparing objects (Kelly, 1955) and forming bi-polar scales.

In regards to this, the RGT has been utilized to execute emotional intelligence which has relation to technological artifacts. In a simpler way, RGT is built based on Kelly’s (1955) idea where all individual objects have their own set of notions that has relation to them. Using RGT, the most common procedure to execute comparison is the use of triadic approach which three artifacts known as elements (i.e., a form of triad) are compared at a time and requested to describe a similar property shared by two out of three elements by the participants. Moreover, the opposite of property of the two mentioned element is also sought. The property that results from this will become a bi-polar scale which is basically called a construct (Fallman & Waterworth, 2010; Heine, 2009), and represented the notions that relate to the participant. Taking example if the characteristics one’s use are —Hotll & —Coldll, the construct can be called Temperature. All in all, the RGT method was found to be an effective method for knowledge acquisition (Normark & Gkouskos, 2012; Shaw, 1980; Shaw & Gaines, 1995). Hence, Methodological approach by Gkouskos et. al. (2014) had been set and developed to be fixed with research objective, and obtained the data from the RGT design and execution of future workshop as Figure 5.

Figure 5
Developed Methodological approach based on Gkouskos et al (2014)



Thus, ten automotive designers have been chosen as participants to share their thought in design and execution future workshop. The first stage in method of this study explore all concept car in various automotive company, such as BMW, Honda, Peugeot, Mini, Mitsubishi, Toyota and others. At first round, the session did not put any limitation on what type of concept car or what direction should be considered. After general sharing on concept car, the introduction on emotional implementation understanding revealed and had an in-depth discussion on how it contributed to the sustainable transportation design. Hence the second stage focused on the identification of concept car that involved with sustainable transportation and implementation of emotional intelligence. This critical thought sought for any detail of implementation on technology and how it entailed emotional connection with the users. After all of identification and selection of futuristic concepts, six of the most influential concept car that represent emotional intelligence were chosen, and each category by using RGT technique was identified. The data was clearly presented in the result table.



RESULTS

Overall conclusion from the finding showed that the designers really gave 100% participation of their point of view on how the emotional intelligence applied well in concept car that gave large contribution to sustainable transportation issues. There were so many concept car had been developed in transportation industry that needed to have a limitation on the automotive which was similar to the preliminary study in this research. Even in automotive itself, there were voluminous kinds of concept car but not all concern on sustainable transportation issues. The session has been done by mutual realization among 10 car designers on this research objective in identifying the role of emotional intelligence in sustainable transportation design. In the second stage, the deep thought on emotional intelligence became a spotlight and the identification of six of the most influential concept cars were quit challenging as the detail characteristic had to be evaluated. After detail evaluation, the RGT then used to collect all data on selected concept car. The Six of the most influential concept cars that could be well implement by the emotional intelligence and sustainable transportation issues were Honda Urban EV, Renault Symbioz, Roll Royce Next 100 years, Peugeot Instinct, BMW Next 100 years and Mini Next 100 Years. The results from RGT by the designers represented the implementation of emotional intelligence led to the thematic concept on Urban Home-like, Drive Home-Like, Status-Centric, Driver-Centric, Advance Dynamic and Urban Advance. The detail on results highlighted a strong emotional connection between the user and automotive could produce a better life in the future as presented in Table 1.

Table 1
Data Collection and analysis using RGT Technique by Kelly (1955); Gkouskos et al (2014)

Emotional Intelligence Man-Machine Communication Platform		
Urban Home-like  Honda Urban EV		<ul style="list-style-type: none"> o Digital display o Battery status o Door trim digital side mirror display o Wide angle display up front o Cozy Home-like Interior layout
Drive & Homelike  Renault Symbioz		<ul style="list-style-type: none"> o 3 main displays o Digital Panoramic roof Utilizing Camera o Ecosystem integrated with mobile phone to control features such as seat, door, air condition remotely o Active head up Display o Digital rear mirror Display
Status-Centric  Rolls Royce Next 100 Years		<ul style="list-style-type: none"> o Digital display o Automated door o Big display o Autonomous Personal driverless vehicle-no steering o Voice assisted features – greeting
Driver-Centric  Peugeot Instinct		<ul style="list-style-type: none"> o Seat turns to comfort mode when entering autonomous mode o Various mode configurations changes on UI and UX. Autonomous, autonomous sharp, autonomous soft, drive-relax, Drive Boost, o Retractable steering upon autonomous drive
Advance Dynamic  BMW Next100 Years		<ul style="list-style-type: none"> o Obstacle indicator on the dashboard o Communicate with pedestrian To cross the road o HUD active Display Road guidance & info graphic o Light ambient depending on modes
Urban Advance  Mini Next 100 Years		<ul style="list-style-type: none"> o Active graphic on body parts – door panel, hood, & roof o Egress – projected greeting bye. Add reminder for next meeting o Waving feet option o Dedicated dial-menu o Handover steering-left, right, or middle



CONCLUSION AND FUTURE WORKS

The result of this study showed how the emotional intelligence tried to cope with the sustainable transportation issues by analyzing through concept car development. It also highlighted that emotional intelligence that it was very important, and really meant to the communication that related it with the design, especially transportation design. Indirectly, it could solve many sustainable transportation design issues. Hence, to conclude in a simple understanding based on the results on how the role of emotional intelligence becomes tremendous, it could be explained as followed:

Emotional Intelligence as a new dimension in sustainable transportation design

The document reviewed at the early stage in this research already discussed on how it was really important to have another dimension to seek the sustainable transportation design rather than common approaches that only focused on environmental issues, such as emission of CO₂, pollution or climate change. Based on the result of this study, the data presented clearly on how emotional intelligence taking its roles as a new dimensions that could be seen important in the future research studies.

Emotional Intelligence understanding as a bridge for implementation technology

The previous research that used emotional intelligence approach was just covered psychology field and business areas like job performance and behavioral in working environment. In this study, the emotional intelligence was applied as ability to cleverly implement the emotion which indirectly could be seen as a bridge for implementation technology.

Emotional Intelligence: High Technology vs. Human Life

Besides a communication that evoked human feelings through design; emotional intelligence also meant to educate people to understand automotive design which could help users/drivers have good feelings when driven on the road. The issues and problems like bullying on the road occurred due to the lack of confidence while driving could be settled, and directly helped driving performance as well as accident case reduction. Automatically, the roles of emotional intelligence could promote better understanding on high technology versus human life.

The design practitioners and automotive users should be aware of the importance of emotional intelligence by recognizing the application of it in the daily life. Significantly, the information and knowledge regarding the emotional intelligence were very beneficial, and will become a significant contribution to the development of our local automotive design industries. This conclusion could be used as the recommendation for future study. Based on data gained through the document review, design execution workshop and data identification through RGT could also suggest future study to cover on sustainable transportation design issues by cover other types of transportation and other design fields, such as product and furniture design. Other than that, another methodology could also be used to gain wide knowledge of user perception towards this study.

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Entrepreneurial Ideas Catalyst for Careers of Graduates through International Collaboration

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ABSTRACT

Campus entrepreneurial ideas were being realized in UiTM Kedah Branch Campus as part of the initiative to develop creativity as well as innovative, adaptable, and lateral thinking in producing the high quality demand of graduates. Within the Malaysian government initiative, the Action Plan of Malaysian Higher Ministry Education were alluring in enhancing The Higher Education Entrepreneurship Development Policy with the initial intent of achieving high quality human capital, equipped with entrepreneurial thinking, attributes, and values, hence to produce more graduate entrepreneurs to act as catalysts for economic transformation. Inspired by this action, UiTM Kedah management has taken its step by promoting entrepreneurship as club activity and individual involvement through several initiatives, such as night market, car boot sale, push cart, alumni business incentive, training by caterer providers, kiosk and international wholesale programs. However, students merely recognized these positive initiatives by practicing as entrepreneurs during their studies and resulted in job hunting for private or government sector after graduated. The prospect of entrepreneurial ideas in the campus environment were explored in regards to what were the initiative that has been done and the possible potential areas in entrepreneurship to be explore through an international collaboration. The intention of this paper is to outline the achievement and possible action to stimulates entrepreneurial awareness and recommend some insights into how campus can develop entrepreneurship activities by upcoming collaboration. The suggestions are then made as a way forward in assessing entrepreneurial awareness and action among graduates whom will be a player in realizing successful economic nation.

Keywords: *Campus environment; Entrepreneurial ideas; Graduate entrepreneurs*

INTRODUCTION

Malaysian universities are responding to the government initiative by encouraging graduates to take up or consider entrepreneurship as their potential career path. Within this initiative, the Malaysian government has identified entrepreneurial activity as a catalyst for economic growth and capacity building to enhance the innovation creativity and competitiveness in this country. The conversion from a knowledge economy to innovation economy is hoped to transform Malaysia to become a developed and high-income country by the year 2020. However, to achieve this aspiration, it requires the support of quality human capital and competitive. In this context, the ministry believes it is significant for students in higher education to be exposed and implemented with the values and entrepreneurial skills. The skills include leadership, innovation, creativity, resilience, competitiveness, self-reliance, risk measure and the ability to identify the opportunity and creation (Ministry of Malaysian Higher Education, 2007).

Entrepreneurship Development Policy Institutions of Higher Learning were launched in 2010 in order to promote education and entrepreneurial development among higher institutions in Malaysia. The policy



driven is expected to generate more graduates equipped with high values, thinking and entrepreneurial attributes. In addition, it is driven to increase the quantity of entrepreneurs among graduates by engaging them in actual business as a catalyst for achieving economic transformation from middle to high-income economy whilst producing academicians equipped with values, skills, thoughts and attributes of entrepreneurship (Malaysian Higher Education, 2007). Entrepreneurship educations were listed as an important component in generating a Malaysian society with creative and innovative attitude or mind as envisaged under the Human Capital development Plan Innovation. It is seen as significant in improving the employability of graduates and achieving the government aspirations in improving the welfare and the ability of community by reducing the gap between the rich and poor within urban and rural communities.

Alongside with this initiative, The Action Plan of Malaysian Higher Ministry Education in enhancing The Higher Education Entrepreneurship Development Policy with the primary goal of generating high-quality human capital, equipped with entrepreneurial thinking, attributes and values, hence to produce more graduate entrepreneurs to act as a catalyst for economic transformation. In realizing this vision, the government expected the creative content industry as one from the sources to contribute at least RM33 billion towards the Gross National Income (GNI) by the year 2020. The improvement was seen as this industry has contributed RM9.4 billion equivalents to 1.27 per cent of the GNI with a workforce of 45,000 in 2008. It gradually increased to 5.8 per cent with a workforce of 100,000 in year 2010 (Bernama, 2016).

Entrepreneurship has become a Critical Agenda Project under the Strategic Plan for Malaysia Higher Education. The Entrepreneurship Development Policy for Institution of higher learning was introduced in 2010 to promote well-planned and holistic entrepreneurship development in Institution of Higher Learning. Among the others aims in the policy is to promote a conducive environment and ecosystem in university through the establishment of more students’ cooperative in entrepreneurial activity.

Compared to neighbor country, creative industry in Thailand was valued almost 50 billion (THB 1.61 trillion) in 2014, accounting for around 13% of the country’s gross domestic product (GDP). The Thai government recognizes the importance of this sector focusing on value-based economy from heavy industry and the market size expected to increase by 20-25% annually every five years. In addition, Thailand is the second economy in Southeast Asian and higher middle income country with a population of almost 70 million people (Wanders, 2018). The Thai government focusing on making the country as the ‘Creative Industrial Hub of ASEAN’ as part of the ‘Thailand 4.0 Strategy’ aims to transform the Thai economy driven by innovation technology and creativity as a conclusion to remain competitive, and to overcome the middle-income trap. Creative industry became one of the targeted industries, and is expected chances to be given incentives and investment to commercialize the sector worldwide.

The propose collaboration will acknowledge the linkages, and seek the potential of research and development through methods and programs which could enable both parties to stimulates the creative and innovative ideas.

ENTRPRENEURIAL CAMPUS

Entrepreneurship education is a course of action formulated to develop individuals’ mindset in entrepreneur expertise activities and possibilities. It promotes innovation, creativity and effectiveness to motivate economic improvement (Ghafar, Harun, Khir, & Sidek, 2012). Gibb (1987) as cited in Ui Wei Lii (2006) argued that to develop entrepreneurs, the focus of the education system needs to be shifted away from the traditional to “the entrepreneurial” as in Table 1. This is supported by Timmons (Timmons, 1989) who added that entrepreneurship is the competency to construct and initiate something from practically nothing.

Table.1. Traditional versus entrepreneurial focus

Traditional focus on	Entrepreneurial focus on
The past	The future
Critical analysis	Creativity
Knowledge	Insight
Passive understanding	Active understanding
Absolute detachment	Emotional involvement
Manipulation of symbols	Manipulation of events
Written communication and neutrality	Personal communications and influence
Concept	Problem or opportunity



Entrepreneurship in education and training as suggested by Jamieson (Jamieson, 1984), can be ranked in three different ways including education “about” enterprise (i.e., awareness construction), education “for” enterprise (i.e., the establishment of impassioned entrepreneurs for business set-up), or education “in” enterprise (i.e., growth and evolvment cultivation for established entrepreneurs). According to Timmons (Timmons, 1989), entrepreneurship is the ability to create and build something from practically nothing. It includes the establishing, engaging, performing and building a company or business. Supported by Curran and Stanworth (Curran & Stanworth, 1989), entrepreneurship is the process of creating something different from products or services in the market where one new economic entity centered on a novel product or service.

UiTM students have to enroll in the entrepreneurship subject of ETR300/ENT300 to learn entrepreneurial knowledge, and plan to mock up their business plan as practical as well as in theoretical classes. Students needed to come out with an idea during their classes and identified fresh new business ideas as their business project. This activity will equip student with the basic knowledge of business registration, managing and marketing their business. In spite of this earlier advantage through their syllabus, graduates merely recognize this opportunity to develop their own business after graduates (Hashim, Yusoff, & Ghazali, 20116). This ends up with the lack of graduates who focus their career in entrepreneurship. Considering the lack of student focusing in this area, UiTM Kedah management considers this opportunity through an initiative to stimulate entrepreneurial interest among students by giving them a chance and platform to practice entrepreneurial activity during their studies as part of their financial support and programs.

Among the initiatives that have been encouraged, and executed by UiTM Kedah in year 2018 were listed in Table 2. The activity was conducted within the club initiatives and involved group of peoples to ensure its effectiveness and the sales margin were at higher level. Usually, the sales carnival is organize according to the event date or program as part of the activity to encourage participants or public to visit the event.

Table 2. Entrepreneurial activities in UiTM Kedah in 2018

No	Activity	Date	Places	Objective	Involvement
1	IMet 5.0 Bootcamp	22 Mar 2018	Alor Setar	Apply National Blue Ocean Strategy NBOS in business	35 persons
2	ASEAN Virtual Business Plan Competition	31 Mar 2018	Accounting Research Institute	Exposure and opportunity in business at international level	18 persons
3	Carnival Convocation Sales 88th	9 Apr 2018	Perdana Hall	Opportunity for internal club in business activity	4 clubs
4	Mini Alumni Carnival Convocation 88th	8 & 9 Apr 2018	Academic Courtyard	Opportunity for alumni in business activity	10 persons
5	Usakanita Sales Carnival	16 – 19 Apr 2018	Academic Courtyard	Opportunity for student to involve in business activity	65 persons
6	Bazaar Ramadhan	20 May – 12 June 2018	MASMED Walk	Opportunity for student and outsiders to involve in business activity during Ramadhan	6 persons
7	Entrepreneur Development Program (<i>Mjies cap</i> & <i>Bujang Fried Chicken</i>)	Semester Mar – June 2018	MASMED Walk	Entrepreneurial Training for students interested in business with external entrepreneur guides	40 persons
8	Street Retailing Push Cart	Semester Mar – June 2018	Academic Courtyard	Opportunity for student club to register and involve in business activity	45 persons
9	Kiosk Fast Track MASMED	Semester Mar – June 2018	Administration Block	Opportunity for entrepreneurial club to involve in business activity	10 persons
10	Mindset Changemaker Moduls – Design Thinking	14 July – 8 August 2018	Classroom	Teaching on business opportunity and practice by teaching and learning activity	1800 persons
11	Online Entrepreneurial Lecture	6 Aug 2018	Perdana Hall	Motivational courses on online business	1800 persons
12	Online Entrepreneurial workshop for Staffs	27 – 28 Sept 2018	Lab 6	Online business exposure	60 persons



13	Entrepreneurial Cultural Visit	20 Sept 2018	Spritzer Factory, Coffee Factory	Industrial factory visit for exposure	35 persons
14	Edu Tourism Carnival	6 – 7 Oct 2018	Perdana Hall	Promote tourism product to tourist	250 persons
15	Carnival Convocation Sales 89th	29 Oct 2018	Perdana Hall	Opportunity for internal club in business activity	20 persons
16	Mini Alumni Carnival Convocation 89th	28 - 29 Oct 2018	Academic Courtyard	Opportunity for alumni in business activity	8 persons
17	Social Entrepreneurship Project	30 Oct 2018	Kampung Bujang	Opportunity for students in business activity (preloved items)	6 persons

CHALLENGES AND OPPORTUNITY

Inspired to stimulate entrepreneurial interest and awareness among students, UiTM Kedah management has taken its step by promoting entrepreneurship as club activity and individual involvement through several initiatives, such as night market, car boot sale, push cart, alumni business incentive, training by caterer providers and international wholesale programs. The aims of these initiative was to promote a conducive environment and ecosystem in university through the establishment of more students’ cooperative in entrepreneurial activity while studying and as a first step for their career in entrepreneurship.

Club activity were organized and approved by the organizer through students’ welfare unit and the arrangement, and the organizer would conduct the activity or program to generate income to support their club activity. The financial flow was monitored through a report submitted after the program. Individual participant in entrepreneurial activity was advertised, and the participants willingly registered and got actively involved in the business. Business involving with food and food preparation asked the participants to take a medical injection as vaccine to protect the quality of food, and also prevent the health problem among customers. This ensured all the necessary guidelines and procedures which were followed according to the health law. Night market activity was conducted once a week inside campus. This activity promoted a better health and safety food for the customer as all the guidelines could ensure by the organizer. International wholesale programs were organized by a group of students in club through a visit to popular business destination, such as Ho Chi Minh in Vietnam, Guangzhou in China and Bandung in Indonesia. The participants spent their budget on several products which are potential to be sold in campus and the profit will goes to the participants and club savings. This activity encouraged the participants to continue their business networking, and further diversify their future product sales.

Caterer providers in the campus were conducted a training to the participants as a program to encourage students to learn and work during their studies. This opportunity could stimulate their awareness, and solve their financial problems during their studies. It allowed their commitment to schedule accordingly to their timetable, and would not affect their classes. Currently, there are two caterer providers who willingly take part in this program, and cooperate with 40 students as apprentices in this initiative. The other initiatives were conducted in UiTM Kedah, such as car boot sale, push cart and alumni business incentive were continuously handled according to the participants and events. The profit gained from the activity went to the participants and organizer as a part of their contribution in the entrepreneurial activity. The activity and initiatives still continuously provide a chance to brainstorm for more spaces and opportunity in entrepreneurship activity which could be benefit to the students.

In order to continuously support the activity, the program needs to attract consumers and the entrepreneurs who need to seek a creative and innovative product as their goods to fulfill consumer demands. Besides a gap in generation interest, style and trend, and a quality and workmanship as factors that affected the sales, the urge to find new products or services will be the main challenges for graduates or students to carry on the entrepreneurial activity.



CONCLUSION

Entrepreneurial ideas in the campus environment were proved to be successfully achieved if the collaboration among participants and providers were systematically handled. The achievement of these initiatives would stimulate entrepreneurial awareness among students as well as future intakes. These initiatives were considered as part of contribution from the management for students to fully utilize the opportunity to develop themselves in entrepreneurship. However, in order for them to become successful entrepreneur, they needed to be competitive and creative enough to survive their business journey. Creative and innovation aspects could assure them to sustain and continuously survive in the market. The potential of proposed international collaboration in the area of entrepreneurship could encourage more creative entrepreneurs and innovation ideas to be merged and developed as future continuous linkages between both universities and countries.

According to Howkins (2002), a creative entrepreneur is someone who uses their creativity to unlock the wealth that lies within themselves. He adds that the difference between creative entrepreneur and noncreative individuals rely on functions of financial preferences, as in most industries, an individuals need capitals to develop a business. The entrepreneurial approach should concentrate on five main characteristics including vision, focus, financial acumen, pride and urgency (Howkins, 2002). This is supported by Ball (2003) who identifies basic requirements for creative individuals including excellent in communication skills, networking and team approaches to entrepreneurial tasks in order to succeed. The achievement of these initiatives depended on the participants themselves. Without discipline and knowledge to survive in the entrepreneurial activity during their studies, the participant would not continuously practice after they graduate. The management only provided the platform which would be easier for them to start. Moreover, their future would depend on the readiness to practice the knowledge and experience through the networking and linkages.

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In Family We Trust: The Role and Status of Women in Thai-Chinese Families

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ABSTRACT

This article was the analysis of the role and status of women in Thai-Chinese families that found within *Leud Kon Khon Jang*, or *In Family We Trust*, a Thai television drama by Nadao Bangkok and 4Nologue which broadcasts twice a week on Channel One 31. The mystery drama told the story of the Jira-anan family, the crazy rich Thai-Chinese clan that owned a chain of hotels worth a billion baht. When the grandfather, the revered head of the family, passed away and his will revealed to his children and grandchildren, the family members were pitted against one another due to perceived unfairness. A breaking point was reached when the oldest son, Prasert, was found shot dead in his own bedroom, leading each family member to suspect others of the crime. Some suspect was his younger sister, Passorn, whom he just fired from the family's company, and whom he even slapped publicly following an argument. *In Family We Trust* portrays and explores the dynamic of Chinese culture that tended to favor sons over daughters, men over women—something those from Thai-Chinese families could definitely relate to. Some of Thai-Chinese families, as Jira-anan family, still followed the Chinese tradition that was mainly rooted in patriarchal kinship that came from the doctrine of Confucianism, which regulated the role and status of Chinese women within familial and social aspects of their culture.

In Family We Trust gives us the understanding of Thai-Chinese people with their unique culture, the images and reflections on the status and role of women living in the intense Thai-Chinese families and may be a reflection of change and the conflict that is in between traditional Chinese and modern Chinese tradition.

Keywords: *The Role and Status of Women, Thai-Chinese Families, Confucianism*

INTRODUCTION

Leud Kon Khon Jang or *In Family We Trust* is a new suspense drama on One Channel directed by a well-known Thai director Songyos “Yong” Sugmakanan, (Fan Chan, Dek Hor, Hormones season 1 and I Hate You I Love You). This suspense drama revolves around a complicated Thai-Chinese family of Jira-anan, a wealthy Thai-Chinese family that operates its own hotels in Bangkok and Pattaya. The drama follows the members of the family, which seem to enjoy a strong and unbreakable bond. But things are not what they seem.

When the grandfather, the revered head of the family, passed away and his will revealed to his children and grandchildren, the family members were pitted against one another due to perceived unfairness. A breaking point was reached when the oldest son, Prasert, was found shot dead in his own bedroom, leading each family member to suspect others of the crime.

Things got all the more complicated when just about everyone had a motive to kill Prasert, who unfortunately made a few apparent enemies right before his death. Some suspect his younger sister, Passorn, whom was just fired from the family's company, and whom he even slapped publicly following an argument. Her hotheaded sons and police husband were also primary suspects. Others targeted Prasert's wife, who has



found out her husband chose to marry his mistress and long-time lover with whom he also had an adult son with. Earlier suspicions seemed to point to the two women, though of course the real culprit could be someone else altogether.

In Family We Trust stars some of the Thai best actors. But great actors are not the only reason for the popularity of the drama. But it's the fact that it respects on the untold tensions in most of the Thai-Chinese families, including the status of female members that many of us could simply relate to.



Picture 1: Jira-anan Family

Passorn Jira-anan (Suriyapairoj): The Neglected Daughter

The character of Passorn was played by Kathaleeya “Mam” Mcintosh who raised in Thai-Chinese family that give priority to sons over daughters.

She was an English-Chinese-Thai. Her father was English and her mother is a Chinese migrant in Thailand. Her family was like the family in the drama, sons and nephews would be given everything before and more than daughters and nieces.

When growing up, she was educated by the family to understand the Chinese cultural context. The son must be a descendant and head of family comparable to the war, men must be warriors. The women were behind the house preparing food. However, when she had her own family, she changed her way of raising children to a more contemporary one.

Therefore, she used her family memories to play this role, Passorn, the first daughter but the third child of the Jira-anan family who was seen as an outsider because she married, and changed the last name to her husband’s family name, Suriyapairoj. The difficulty of this role was the complexity of emotions that were maternal love, love for the family, love for the work, good relationship with people around her and love for justice.

Passorn was suspected in the murder case of her brother, Prasert, who was killed by someone in this family. Because she, the only one daughter who was still alive in the family, was the one who perceived unfairness in the division of her father’s legacy. In spite of the Jirananta's Pattaya branch, she has been a pioneer and has managed it since its inception but she has got no share in her family business (GongSi 公司), so she was distressed and upset as well as wanted to buy the hotel branch from her brother, Prasert. Eventually, she got fired from the family's company, and was slapped publicly by Prasert following this argument.





Picture 2: Passorn Jira-anan (Suriyapairoj) , the daughter of Jira-anan family

Confucianism, Men and Women: Sexual Imbalance in Chinese Society

In a traditional male dominated Confucian family, the eldest son is held in the highest esteem and is responsible for carrying on the family name and lineage, keeping property in the family and presiding over ancestral rites. (Hays, 2008)

The preference for boy babies over girls in Asian society is tied up in part of the Confucian belief that a male heir is necessary to carry on the family name, provide leadership for the family, and take care of the family ancestors. Chinese parents worry that if they do not produce a male heir no one will take care of them in their old age and no one will keep them company or look after them in the afterlife.

Confucius famously said that a good woman is an illiterate one. Women often suffer under the Confucian system. Not only they are ordered around by men, they are often ordered around by each other in very vicious or mean ways. Older sisters have traditionally pushed their younger sisters around with impunity, and mothers of sons are notorious for treating their daughters-in-law like servants.

There are many factors that make the value of having a son become "one of the highest values" in Chinese society. (Tangcholtip, 2008)

First, the need of a farming society needs a lot of labor. In ancient Chinese society, men are important in producing and raising a family. When the daughter gets married, she has to move to her husband's house (Patrilineality). Therefore, she cannot continue to work for her family. Having a daughter is considered a disadvantage in terms of labor productivity. A large number of people in Chinese society are one of the factors that determine the value of society. This is reflected through the organization of Chinese society. There is a hierarchy of relationships. Who is more important than who is a common question in asking whether it is a relationship between old men and young men, brother and sister, father and child, husband and wife as well as men and women.

Second, the son is responsible for taking care of the parents according to the concept of Confucius. Gratitude is very important. The eldest son has an unquestionable role in caring for his family and his parents. As a result, Chinese society has come up with a variety of ways to believe that a son can inherit. When got married, a daughter is considered to be another family. Having a son is one of the secrets of parenting in the old days. This is a very influential concept, especially, in societies where there is no welfare state for the elderly.

Third, the son is obliged to inherit. The eldest son of the family is responsible for the rituals, such as the son can only bring the spirit of the parent to heaven. The daughter cannot do it. Rituals in Chinese society that emphasis on the cult of ancestor worship is created for creating unity and family harmony, based on the "root" of the family.

In addition, Chinese society is a society where the descent of the family is transmitted by male (Patrilineal). The childless son is inherited in Chinese Society to be a deadly sin.

Mencius said that “不孝有三, 无后为大 bù xiào yǒu sān, wú hòu wéi dà, "or there are three ways to be unfilial; having no sons is the worst. Men are expected to have successors. However, when a man cannot have a son, the wife or the bridegroom often becomes a defendant in the eyes of her husband's family.

The importance that the son has over the daughter is reflected through the hierarchy in the grandchildren. The child of the eldest son or eldest of the clan will be called "大孙, dà sūn" (The Big Grandson).

The word "大孙, dà sūn" means the eldest grandson of the clan. (Or son of the son of the family line only). Dà sūn also means the youngest son of his grandfather. In the drama *In Family We Trust* Dà sūn “Pete”, Prasert’s son, was played by JJ Kritsanapoom Pibunsonggram.

Passorn, she has 4 sons; Yi, Earn, Tao, Taey. Yi, the oldest son, is older than Pete. Even though Yi is the eldest grandson of the clan and older than Pete, a son of Passorn, the daughter of this family, must be lower than Pete, the son of a son.

In the scene of the grandfather’s funeral, the relative hierarchy is clearly visible as in this picture



Picture 3: Chinese funeral ceremony (功德, kongtek)

Jute suit with square hat is for sons and dà sūn.

Jute suit with sharp hat is for daughter and daughter-in-law. Daughters-in-law are family members because they use the family name. Passorn, although she was a “direct-blood” daughter, she was classified in this hierarchy because she was just a “daughter”.

White suite with white square hat is for a Son-in-law. In this case, he was Passorn’s husband. He uses his family name, but he moved into her house, the house of Jira-anan family.

White suite with white sharp hat is for “inside grandchildren” (The children of the sons). When a son gets married, and has a child, whether a son or a daughter, they must use the family name so they are the “inside grandchildren” that have more rights than the “outside grandchildren” that were born from the daughter. In this case “inside grandchildren” are Vegas and Macau (The fourth son’s children) and Mei-Mei (the second son’s daughter).

White suite with blue sharp hat are Passorn’s children “outside grandchildren” that called “外孫 wài sūn”. When a daughter gets married and has a child, whether a son or a daughter, they must use the father’s family name so they are the “outside grandchildren” that have less rights than the “inside grandchildren” that were born from the son. Although Yi is the eldest grandson of the clan and older than Pete, a son of Passorn, the daughter of this family must be lower than Pete, the son of a son.

Confucianism and Family Business (GongSi 公司)

The Chinese in Thailand are not like the Chinese in mainland China. Because Chinese people in Thailand came to Thailand from the days before the Communist’s Occupation. Therefore, Confucian ethical values still be held by Thai-Chinese families so some of the personality and character of Thai-Chinese people are different from the mainland Chinese people. (Mahatdhanobol, 2018)

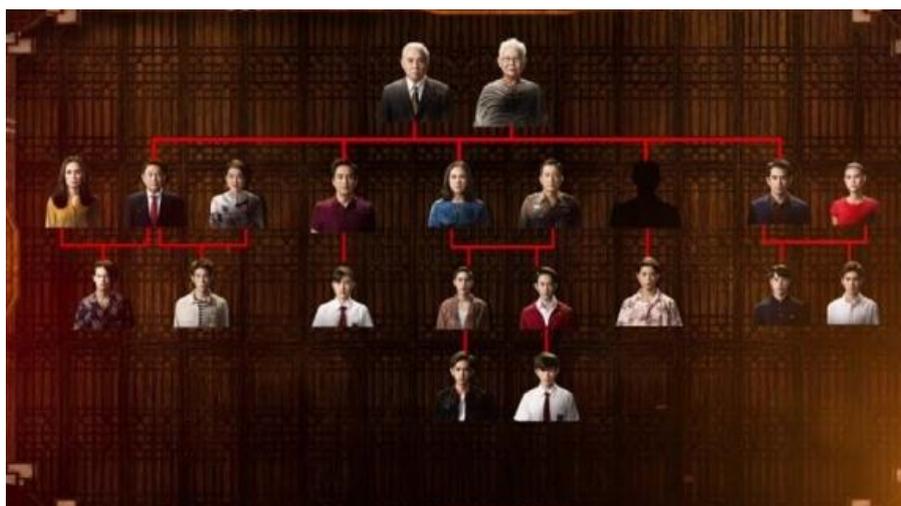
In Family We Trust reflects the conflicts of family relationships when the "Grandfather (Wàigōng)" does not provide a legacy that suits the dedication of "Passorn", the eldest daughter of a family who work in the business for a long time over 20 years. Therefore, it made a fraternity brawl cracked in the family.

The dividing inheritance in Chinese families is to equally divide the inheritance to the sons; the eldest brother may be received a little bit more than others. The succession of the families will inherit to the sons daughters have nothing. On the other hand, in Thai-Chinese families, they are not exactly the same as Chinese families. They are rather similar with Thai families that gave the inheritance to sons and daughters equally. It is called bilateral descent. Hence, the status of Thai-Chinese women is higher than traditional Chinese



women and receives higher acceptance from families and society attribute to bilateral descent concept. (Chunsumimol, 2000)

In the case of Passorn from the testament of her father found that she was the only one who did not receive the share of the family’s hotels in spite of the fact that she was the one who pioneered the Pattaya branch from the beginning. Furthermore, Pete (dà sūn of Wàigōng), Prasert’s son, received 25% of the share that should be Passorn’s. Therefore, problems raised so; the division of inheritance portrayed the traditional Chinese custom.



Picture 4: Jira-anan’s family tree

Vorasak Mahatdhanobol (2018) said that “If we use the liberal logic to interpret this tradition, it’s unfair for women. But if we look at it from another point of view, Chinese people thought that when woman was married, she moved into her husband’s house and left her house. She gains the property of her husband’s family. Her husband must take care of her, and her son must take care of her.” We thought that Chinese tradition is unfair and out-of-date because we look at it with the liberal point of view.

GongSi (公司) or family’s business is common purse which every member receive the share. GongSi (公司) is Chinese cultural system that depends on the relationship of family members. It is the common property for the family that everyone has the right. However, if someone thought that this system is unfair, the conflict will rise among the family members. Some families solve the problem by making a prosecution, but for most of the families, the head of the family must do the testament so everyone must accept it.

GongSi (公司) uses the ethical value of Confucianism. Everyone must follow this value. They share the profit and not compete for it. This system really need trust, they must be loyal. If the family is in harmony, this bond will be strong and unbreakable; but if the family becomes divided, may be the blood will shred.

However, in this day, most of the Thai-Chinese families don’t use the traditional GongSi (公司) system but divide right and benefit through the documents and made the prosecution when the conflict happened. Therefore, *In Family We Trust* may be a reflection of change and the conflict that is in between traditional Chinese and modern Chinese tradition.

In Family We Trust: The Portraying of the Role and Status of Women in Thai-Chinese Families

The Chinese tradition is mainly rooted in patriarchal kinship, which regulates the role and status of Chinese women within familial and social aspects of their culture. It narrates the meaning of the repression of women under the male-dominated culture. (Chutataweesawas, 2017)



The patriarchal kinship is still deeply rooted. The term patriarchal refers to the rule of the father or seniority that is used to describe a family system that is masculine and men play a leading role, hold the moral value, honor in society, possession and control of property. This concept is accepted by Chinese immigrants around the world, as in Thai-Chinese families and used as a conceptual framework and practices that are rooted. In Chinese culture, there are traditions and cultures which show inequality between men and women, including oppression to create an illusion that women are obsessed with the idea that they are not equal to men. The three main principles of Taoism and Confucianism are: ancestor worship, spiritual beliefs and heavenly beliefs. These three beliefs fully conceal the political implications of male domination, including power in the area which shows the status of women as ineligible. It's prominent patriarch. (Rodthip, 2012)

The concept of limiting Chinese women's rights in Thailand is reflected in many arts , for examples in poetry, novels, plays, dramas and films depicting traditional traditions that depict the role of women in conservative families, based on Confucius concepts and practices in the teaching of children. As in the result of the study “Status and Roles of Women in Thai-Chinese Families in Thai Domestic Novels Between 1995 and 2003” shows that the eight selected novels from three authors (Piyaphon Sakkasem’s King Phai Bai Rak, Thang Sai Than, Ban Roi Dok Maiand Tai Ngaio Tawan; Sophi Phannarai’s Chao Sua Noi, Muai Inter and Chao Sua Chao Samran and Thipkeson’s Lady Yaowarat) present globalization in Thailand as a key factor in changing the statuses and roles of women. As for daughter characters, (i.e., in the case of Passorn) socialization by the education institution lead them to prove their ability to work as well as men. However, life in modern society may cause daughters with traditional Chinese upbringing to have cultural conflicts. Finally, they learn their ways to accept their roots, and adapt traditional culture properly to suit life in the modern world. (Withayapraphat, 2012)

Thus, the drama *In Family We Trust* was one of the contemporary media that reflected the repression of women under the male-dominated culture. With the suspense plot of the drama, humanly characters, *In Family We Trust* portrays and explores the dynamic of Chinese culture that tends to favor sons over daughters, men over women—something those from Thai-Chinese families can definitely relate to. Some of Thai-Chinese families, as Jira-anan family, still follow the Chinese tradition that is mainly rooted in patriarchal kinship that come from the doctrine of Confucianism, which regulates the role and status of Chinese women within familial and social aspects of their culture. Furthermore, it also reflects the feelings of the diverse lives that live in one family. Thai-China family that has an intense culture knitting the outer ties seems tight, but there are some hidden cracks inside. This drama provides a clear picture of the Chinese culture, and many things are new knowledge for outsiders. To watch this drama, in addition to being entertained, one thing that the audience will get is the understanding of Thai-Chinese people with their unique culture as well as the images and reflections on the status and role of women living in the intense Thai-Chinese family. This will help us understand it as well.



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The Phenomenon of *Blusukan* Strategy with Animation Avatar Concept in 2018 Political Campaign of West Java Governor, Indonesian.

(A Case Study: Mr Ridwan kamil and Mr Uu Ruzhanuk Ulum As Candidate Election)

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ABSTRACT

The purpose of this study was to answer the question whether the Avatar's political campaign method unable to replace the original figure of the candidate for Governor of West Java, Ridwan Kamil, so as to convince them to vote. This study focused on the phenomenon of communication involving 3D virtual elements in the form of Avatar, the candidate pair of West Java Governor, Ridwan Kamil, in order to greet and directly conduct dialogues toward the prospective voters in a remote-isolated area of Western Java, which did not reached by the internet network. The network used the fleet campaign car as much as six fleets, which there is a campaign tool that one of them conceptualizes duplication of Ridwan Kamil character in the form of 3D Avatar. The research method chosen was from Schutz's phenomenology based on the meaning of the reaction to the avatar campaign method of the candidate pair of West Java Governor Ridwal Kamil in pilkada 2018.

Keywords: *3D, Avatar, Campaign, Character, Community, Communicate, Communication Interaction, MC, Phenomenology, Virtual.*

INTRODUCTION

Political campaign is the most effective communication platform for candidates of governor to the community of prospective voters as they can directly greet people in the range of campaign areas. The challenge faced by the candidates for governor is the 100-day campaign that must be really effective and efficient. West Java is a wide coverage area that the candidates of governor must maximize their communication of the work program of candidate pairs. From data taken from CNN Indonesia (2018) found that the number of West Java voters is 31.7 million people, spread in 627 districts, 5,957 villages/urban communities, and these people will vote at 74,944 voting places.

The challenge is how to reproduce the figures of the governor candidate pairs so that it is able to cover more campaign place within 100 days. The solution to multiply the figures of candidate pairs of governor is conducted by Ridwan Kamil by using 3D technology of virtual Avatar which is paired on six car fleets. The AVATAR stands for the Abbreviation of VirtuAI Transport Aspiration Rindu Team. Based on the monitoring of detik.com, through this car, the residents and Emil or his deputy Uu Ruzhanul Ulum can digitally interact with each other. Residents who want to interact with the first sequence number of the couples simply need to sit at the back of the car facing a screen and camera (Ispranoto, 2018).



RINDU JABAR JUARA



Figure 1. A poster Campaign of Kang Emil

The unique aspect of the avatar is equipped with TV that aired Ridwan Kamil cartoon character, and is able to interact by the community. There is also a TV featuring Ridwan Kamil picture, and can be used for wifie or selfie with a man familiarly known as Kang Emil (Kamis, 2018).

The TV screen mounted on the back of a pickup car type that has been designed in such a way, it serves as a digital interaction space on the backside. Therefore, people who want to have a conversation directly can do it in the back of the car.



Figure 2. The Backside of the car designed to communicate with the avatar via TV



Figure 3. The Ridwan Kamil Avatar 3D view seen by the public via TV screens.

The figure of Ridwan kamil is duplicated into a 3D avatar format. This Avatar is defined by web dictionary of Technopedia as a personalized graphical illustration that represents a computer user or a character or alter ego that represents that user. An avatar can be represented either in three-dimensional form (for example, in games or virtual worlds) or in two-dimensional form as an icon in Internet forums (Technology Dictionary, n.d.). Then, the avatar figure is displayed in real time with the application of game engine technology in it and operated by one operator that has been trained in which the speech style resembles the voice of Ridwan Kamil, and has been given knowledge of the subject matter of the campaign. The existence of the operator sits inside the car and monitor from the camera attached to the TV so that the interaction dialog can be directly delivered.

The Ridwan Kamil duplication concept is fairly new in the 2018 governor’s election. Thus, this study which focuses on the reaction of the chosen community to the duplication of the political figure in 3D Avatar within 100-day campaign consists of three questions including 1) Are people interested in the concept of this



- avatar campaign, 2) Does the community believe that the avatar figure is a figure from Ridwan Kamil, and
- 3) Does the community want to communicate and express their problem to the avatar figure.

LITERATURE & THEORY

This study uses phenomenology of Schutz who base on the search of the behavior meaning. Observations are direct and indirect. Direct observation conducted to explore the detailed observation of the study subjects according to the perspective of the researcher as the main instrument in this study. While no direct observations made during interviews with informants (Babbie, 2010). Technically, the method of observation in this study was conducted by using questionnaires or interview guides to get the data from the observation by informants’ action (Schütz & Helmut, 1970). Interviews were conducted in a flexible and informal so that the views of informants will naturally come to the surface. The consequences of the concept of action in Schutz’s phenomenology bear on the level of research methods that greatly affect the system of observation, especially in the search of the meaning of behavior (action). With the references, there are three models of construction of meaning interpretation of social action including (1) a model of action consistency and objective validity of the construction, (2) a model of subjective interpretation for categorizing human actions and results of subjective meaning of the actions taken by the actor, and (3) an ideal model between the meanings constructed by the researchers with individual social actor and social environment (Kuswarno, 2009). Schutz’s phenomenology of thought influenced by the thought of Husserl and phenomenology of Weber, directs the combined analysis of the action version of Weber’s and Husserl’s *typifications* models (Kuswarno, 2009). Husserl’s *typifications* establishment basis, based on the type of action of the actors in this study consists of the type of action the act itself and the type of action that is based on the social character of the actor in the reality of everyday life. Phenomenology helps construct social science methods in a way to identify, classify, and compare the model of social action as a phenomenon widely towards the establishment of a new behavior (action) model.

DISCUSSION

Social cognition theory argues that the ability to identify anthropomorphic characteristic and categorize object in the environment as humans, animal, or object is a basic human cognitive function (Kunda, 1999). The *Encyclopaedia Britannia* defines anthropomorphism as “the attribution of human form or other human characteristics to any nonhuman object”. Anthropomorphism has also been defined as the extent to which a character has either the appearance or behavioural attributes of human (Koda, 1996). Here, we examine anthropomorphism only in terms of human morphology, or appearance, and not behaviour.

Garau et al (2003) found that people had similar perception and partner evaluations during interaction with either a high or low anthropomorphic images, some researchers have argue that realistic avatars set up higher expectations, which may lead to disappointment when those expectations are not met.

Thus, it seems that the influence of the avatar images, much like the influence of physical appearance, is complicated: anthropomorphism may be influential but it is not the only predictor of how people perceive those represented by visual avatars and future tests of anthropomorphism should control for level of realism and other factors.



METHOD

In this study, the behavior and response of voters who conducted a direct dialogue with the 3D avatars became a benchmark for research. Referring to the theory of the effects of synthetic experience, explores how motion pictures, television, and computers manipulate and rearrange the content and processes of communicated experience, thereby shaping how the audience perceives and interprets the physical and social reality depicted. It suggests that these media are far removed from reality (behind the Platonic Ideal, the actual, and art and poetry), providing their audiences with "synthetic experience" (Funkhouser & Shaw, 1990).

All of these procedures are carried out as a method to bring the campaign tools closer to the hearts of the local community, in order to build an intimate relationship between the avatar team and the community so that the discussion of the work program can be easily conducted by the community.

Synthetic experiences

Babcock (1952) says that from the point of view of communication, an event can be observed in the workings of symbols (act), in certain environments (scene), by individuals or some individuals (agents), using the agency (Babcock, 1952).

Moreover, early efforts can create a space of communication that can bring people into the acceptance of more open information. Therefore, the role of Avatar as a duplicate character of Ridwan Kamil can be easily accepted by the people he visits.

Ordinary people and the local community leaders have their own privacy space during a discussion with the Avatar figure of Ridwan Kamil. They are still accompanied and guided by the MC to provide comfort zones in the interaction process.



Figure 4. The community can ask freely about the solution to the problem in their area directly through the avatar

Body Language

Interpersonal communication (interpersonal communication) is communication between people face-to-face, which allows each participant to capture other people's reactions directly, both verbally and non-verbally. (Mulyana, 2005). Meanwhile, according to Suranto Aw. (2010) interpersonal communication (interpersonal communication) is the communication between someone and other people, can take place face to face or with the help of the media.

According to Potter and Samovar in *Intercultural Communication: A Reader* (Cengage Learning, 2014), body language is the process of exchanging thoughts and ideas by delivering messages in the form of gestures, facial expressions, eye views, touches, artifacts (symbols used), silence, time, voice, and posture and body movements. (Potter & Samovar, 1991)



The questioner has very varied body language when they have a direct dialogue. This body language can be seen and observed by the operator from the car through a camera mounted in front of the questioner

Everything, which is questioned by the community, is directly responded by the Avatar to answer their problems. Because the targeted area of the campaign is specific, an area that is not touched by the internet network, the area whose living depends on cultivating, trading and searching for products of nature to sell. Therefore, it can be predicted their questions are not far from the economic issues. Thus, the readiness of the operator as a representative figure of Ridwan Kamil is already equipped with the knowledge about those general issues.

RESULTS

The results obtained were:

Crowd maker

What was interesting was how the behavior of the people visited by this Avatar Fleet and how the interaction could be awakened to convey the aspirations directly to the duplicated figure of our Ridwan Kamil. There were variety of emotions and attitudes displayed by the public on the arrival of Avatar team. Generally, confusions and awkwardness covered their comprehension of a completely new strategy. Getting the crowd was not easy, although the uniqueness offered was interesting to see, it took an inducement by placing a MC (master of ceremony) to lure and drag people to approach the avatar car area. How the MC invited the community with the rhythm method as a method of approaching the lower middle cultural community that was closely related to the dangdut dish and shake. Dangdut music was often used as a formula for taking sympathy in social attachments. "This has been demonstrated through previous research which stated that the listener's rank further showed that this quality is far more effective in indicating an affective state that is lighter than strong emotions (Gobl, Christer, & Chasaide, 2003).



Figure 5. The MC is inviting the people to approach them.

Interpersonal Communication

The first thing that was observed when the community conducts direct dialogue through the broadcast media of Avatar, was some identical vocabularies, such as the familiar local term when the people of western Java when calling the male figure, such as “kang”. They always use the term “kang” when they want to complain and ask questions. This was common when the two-way communication occurred to a known figure. Nevertheless, in this case, they could not distinguish whether the conversation partner was the real Kang Emil, whether the nickname was Ridwan Kamil or not, in fact only an operator who had knowledge of the ins and outs of the work program and had the talking style of Kang Emil. The existence of 3D avatars during the campaign period turned out to be a substitute for the original figure of the Kang Emil itself, and could become a new communication bridge in place of the authority of the figure expected to be the aspiration



of the visited community, without the appearance of the real Kang Emil. This is consistent with the statement of the results of previous research that says that face-to-face communication is situated: the true challenge of spoken communication is to take into account and integrate information not only from the speakers but also from the entire physical environment in the interaction room takes place (Dohen, Schwartz, & Bailly, 2010).



Figure 6. The Community starts greeting and asking questions with avatars

Interaction

Personal Interaction was built because the operator was able to master the topic of problems in the area, and could be answered right away as if they were dealing with the figure of Kamil Ridwan. Preliminary studies on community problems in the regions were the key to the success of the team in providing policy solutions that would be implemented later. Camera devices were also the most important element in this interaction, so the operator could see the expression, emotion and body language done by the questioner.

CONCLUSIONS

Through the theories of the effects of synthetic experience, it could be concluded that the existence of Avatar could shape the public perception of reality by manipulating the mind to create communication experience. The limited time, reaching ability and personal capacity of Kang Emil could be answered with an avatar fleet as a form of extending the range of political communication during the 100-day campaign. Therefore, this strategy was one of the successful strategies which the great component of the campaign that leads Kang Emil as the newly elected Governor of West Java.

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Narrative Structure in Films Directed By Sophon Sakdaphisit

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ABSTRACT

This study aims to analyze how the narrative in a film directed by the director Sophon Sakdaphisit, whose works are more prominent today. This study is a qualitative research by means of analyzing the content of the film's director Sophon Sakdaphisit. The study found that both films had the same characteristics on these seven aspects including 1) the narrative chronology of most story lines, 2) the round and stereotyped characters, 3) conflicts between characters, 4) the theme based on the middle class in Thailand, 5) the presentation of the artifacts and structures based on age, 6) iconic images of symbols as well as 7) one-man standpoint of the story.

Keywords: *Narrative Structure, Sophon Sakdaphisit*

INTRODUCTION

Sophon Sakdaphisit is one of Thailand's most famous film directors. With the successful directing which is nationally acclaimed, his movies have been recognized by the quality in mainstream movies.

The present work, the film's director Sophon Sakdaphisit has been more widely and effectively discussed in the horror film market. His works are remembered by their narrative, and many works can make a novelty in terms of adorable presentation, while the content has also intensified reflection of society.

Films which were directed by Sophon Sakdaphisit

Films	Year released	Position
The Coming Soon	2008	Written and directed
Ladda Land	2011	Written and directed
The Swimmer	2014	Written and directed
The Promise	2017	Written and directed

All of the films directed by Sophon Sakdaphisit above are a horror film. They are interesting and lead to study. In addition, these films have a narrative structure.

The purpose of the Study

To study the narrative of the film directed by Sophon Sakdaphisit

Scope of Research

The films directed by Sophon Sakdaphisit which were selected in this study consisted of four stories including The Coming Soon (2008), Ladda Land (2011), The Swimmer (2014), and The Promise (2017).

Research Methodology

This research employed qualitative research by using textual analysis in order to investigate the core of the film, the main idea of the study and the narrative structure. In addition, further related documents were also studied for sufficient information.



RESULTS

The study of narrative structure of the films directed by Sophon Sakdaphisit could be categorized into seven aspects including theme, plot, conflict, character, scene/setting and narrative/point of view. They could be explained as following:

1. Theme

The main theme of the films which were directed by Sophon Sakdaphisit focused on the life of people in Thailand that engaged in a variety of problems. For example, the film entitled *Ladda Land* told a story related to family, *The Swimmer* was about teenager, and *The Promise* emphasized economic problems and relationship between friends. Those themes incorporated with various forms of love, and were presented as a horror movie. In general, horror films normally highlight general problems which are not love, friendship, family and couple; in addition, their ending are sometimes beautiful, sometimes do not. These make horror movies awesome.

2. The Storyline

The storyline is an important part of the film. It was said that “All plots are related to something tangible, physical as well as emotional and spiritual conditions; moreover, they concern the reasons and results as well as the relationship between cause and effect.” From the narrative in a film directed by Sophon Sakdaphisit, the storyline could be summarized as followed:

2.1 By following the main characters of the story, the conflict sometimes occurred under the tension conditions, and sometimes unraveled at the end. The sequence of these steps appeared in the films directed by Sophon Sakdaphisit including *The Coming Soon* (2008) *Ladda Land* (2011) *The Swimmer* (2014) and *The Promise* (2017).



Tee, played by Kong Saharat, was a young covetous salesman. He bought a new house to live with his wife and two children. Unfortunately, his company went bankrupt which made him unemployed. Additionally, the village he bought the house turned abandoned due to the murder case. The conflict of the story was a result of his stress losing his job and his children who got lost in the house where the murder case happened. He rushed to find his children in the house and accidentally shout his children. With this pressure, he was madly and unavoidably forced himself to commit suicide shooting his head. However, the unravel sequence was that his sons were still alive.

2.2 Ending of the movies produced by Sophon Sakdaphisit were interesting. Noticeably, those ending could be classified into four forms as followed: 1) the happy ending like in *The Promise* (2017), 2) the immediate ending which a story ended without any clear conclusions, 3) the unexpected ending or surprised or twisted ending, and 4) the unhappy ending which a story ended with the character experience sadness (e.g., *Ladda Land* in 2011 and *The Swimmer* in 2014).



3. Conflict

Conflict is an element that makes the movies enthralling. The nature of conflict is a junction between the two sides that are opposite to each other. In general, the conflict occurred in the scene of one’s immediate decision, the death caused by normal events in life, or emotional, mental, spiritual or evil urges, and other factors. In other words, it is the situation while a hero became a scoundrel or a villain found in the films directed by Sapon Sakdapisit. The conflicts were summarized as followed:

3.1 The conflict between the characters with character. It caused by other people, opposition side or environment (external conflict) of the character which appeared in the movies, such as Ladda Land and The Promise.

Ladda Land



A character named Tee bought a new house. The company of Tee unexpectedly ran off. Their house next to theirs and the village they lived found the dead and ghost. The conflict between Tee and his family members occurred at the house with the dead and ghost, he then intended to buy a new house in another placeto start a better life; however, his wife and children disagreed because of the above reasons.

The controversy is about the two of Tee's children. The daughter was not proud of living with her family as she raised by her grandmother, and she was bias to Tee. This was the main cause of conflict between Tee and his daughter almost entire story.

The Promise



A conflict in this film was a result of the characters named Boom and her close friend named Eyb. Both of them after encountered the Depressions in 1997 decided to kill themselves on the building that had been Boom’s luxury condominium. They promised to each other to die together. However, only Eyb killed herself by shooting her head as Boom was too fear to die; Boom ran away from the place. The conflict happened again when Boom had a beloved daughter, and Eyb wanted to take revenge by bringing Boom’s daughter with her. This made Boom tried to protect her daughter for her old dead friend.

3.2 The conflict was within the mind of the character as an internal conflict that may be the cause of some action and confusion in the character’s mind. The conflict in The Promise was triggered by the realization of good conscience as well as social values in Thailand.



4. Characters

The characters in all films directed by Sophon Sakdaphisit were kind. Most film was based on the reality that eventually happened through the narrative leading by the main characters. The narrative in a film directed by Sophon Sakdaphisit often had characters as followed:

- 4.1 The main character had a well-round character that almost similar to the real human.
- 4.2 The secondary characters and supporting/minor-role character were often static or stereotyped that their role was flat, and their habit would not change for the whole story.

5. Scenes (Setting)

Scene is an important component of the film. The narration in all films produced by Sophon Sakdaphisit based on relaying all details bit by bit until the hidden matter revealed out. For scenes in a film directed by Sophon Sakdaphisit were usually about the time in the past, but most of it had been carrying over at the current situations.



For instance, *The Promise* cited the source of the problem in the Thai Depression in 1997, which was the scene of social and political issues.

6. Symbol

Symbol is an art form that is often found in the many scenes of a film. Most films are frequently used symbols to indirectly represent and communicate a matter.

All films directed by Sophon Sakdaphisit also use symbols. The purpose of using symbols was to convey interest. However, the symbols did not too hard for audiences to interpret and understand. The symbols found in the films were depicted as followed:

- 6.1 Visual symbols of signifying objects to convey the essence of the director Sophon Sakdaphisit, such as in *The Promise*.



In *The Promise*, Sophon Sakdaphisit chose a green apple in order to represent the sense of respect and apology.



6.2 Audio symbols selected in the films were the leading voice for specific meaning which was a conjunction to other elements of films.

7. *Perspective Narrative (Point of view)*

There are two main types of narrative from the perspective of one man and storytelling around the field. Most of the films director Sophon Sakdaphisit typically used in order to run scenes. The perspective narrative found in films directed by Sophon Sakdaphisit could be summarized as followed:

7.1 The narrative from the perspective of one man (the first-person narrator), The film director used this strategy in telling a story in the film because he wanted to make the audiences knew and felt to the emotions of the main characters on the circumstances as well as the people around them.

7.2 The narrative from the third-person narration (the omniscient narrator) was found in most of the films directed by Sophon Sakdaphisit. This way of narration aimed to give the audiences thinking as well as imagination, and share stories.

DISCUSSION

The study of narrative structure of the films directed by Sophon Sakdaphisit showed that most films often presented themes about the problems of human society, especially, love, friendship, family or couples which might be happy and unhappy. The films also often reflected life of the middle class. Moreover, it was found no nobility in the films directed by Sophon Sakdaphisit. This could be analyzed that the film director mainly focused on the middle and lower classes of people in Thailand. Thus, presenting the core idea that most audiences could easily recognize and understand could effectively receive the reaction of the audience.

Most films were developed storyline by employing first-person conflict sequencing. This usually consisted of events as followed: Starting from the main character's inner conflicts or peers. Then the conflict was multiplied, and severed unwinding. Finally, the story finished with it sometimes raveled out, but sometimes did not. The narrative in the above analysis that may be caused by the director showed that the film should be easy to understand, and should correspond to the tastes of the majority of the audience in Thailand.

For the conflict in the film, the conflict turned out that all conflict of films studied was from other characters and the character itself. Most films presented in this analysis illustrated the origins of human society in reality, and the characters suffered from a conflict of both external and internal sequences at the same time. Thus, it could be concluded that conflict of the films directed by Sophon Sakdaphisit was very realistic.

The narration of the films studied emphasized the first-person and third-person narrative which a main character had a key part in pushing the story to continue engaging. The films which were directed by Sophon Sakdaphisit often had two types of characters including rounded character and stereotyped character. These character types could restrict the story sequences. There was no reason from the films that could not build every character to have a deeper dimension. Due to the time limitation and reality reflection, a film should have both types of character to mirror the diversity of social dimensions.

The scene is very important and very prominent in the thriller directed by Sophon Sakdaphisit as he made the common scenarios into horror films; the scenes should be effective to persuade audiences.

Symbols that appeared in the film found that the use of symbols was the visual symbol through the object signification which could allow the audiences interpret and understand the symbols by their own. The narrative perspective of the film was directed by Sophon Sakdaphisit had a 3rd-person narration which entailed an unlimited narrative perspective.

Most films presented diverse perspectives so that the audiences got to know all aspects which implied in each story, and reflected the phenomenon from a different perspective as well.



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SUGGESTIONS

1. Government should has a role in setting and giving an importance to the production of film directing studies in order to promote film production standard of Thailand.
2. Film production industries should provide the media narrative analysis which can enhance knowledge, and guide the production of other narratives of film production in the future.

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Aesthetics in Sofia Coppola’s Film

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ABSTRACT

The Objectives of this qualitative research aimed to study the aesthetic beauty and implications of Sofia Coppola’s Films. The analysis was based on three films by Sofia Coppola. For movie selection criteria, choose from Quality films are widely regarded and awarded at various film festivals. The story is about the girl in the majority.

The results found that Sophia Coppola's cinematic aesthetics were used to present the view through the eyes of a young woman who looks at each world. Although some content may be very violent, Sofia Coppola could convey the story in the eyes of women who see the world should have a story. In the hidden form, the image may not look very intense, but the latent meaning, if interpreted, can reflect quite violent.

The character in the movie Sophia Coppola was often drifting like a dream. Through the world, reflect on what was the conflict and the crisis they were facing, her movie repeated shots (e.g., looking out the window at a glimpse of past events). The reliance on the natural light of all Sophia Coppola films, which gives her a unique signature.

Keywords: *Aesthetics, Sophia Coppola*

INTRODUCTION

Film production which is a popular collage in the world is made up of many skills. In addition, the word “Aesthetics” from general research is considering beauty value as well as art appreciation. The result relates to feeling and mental conditions. It depends on the basic status, experience and satisfaction of each person. The researcher needs to study about Aesthetic in Sofia Coppola’s Films

Objective

1. To analyze and study the aesthetics in Sofia Coppola’s film.
2. To analyze the meaning in Sophia Coppola's films.

Research Methodology

A film analysis was employed to analyze Sofia Coppola’s films. The analysis processes were ordered as followed:

1. Analyzing an anesthesia-based anesthesia and the concept of symbolism in the meaning of the film
2. Analyzing the use of the concept of gender and religion
3. Analyzing access to aesthetics in films such as narrative structure, content, symbol, beauty and value.



Scope of Research

The aesthetics of the film were analyzed and studied. Sophia Coppola, the director who is featured in the use of narrative and iconography. Three films directed by Sophia Coppola were analyzed in this study. From the recording media (DVD) used in the analysis, the films which presented the appearance of "Aesthetic Films" included:

- The Virgin Suicides (1999)
- Lost In Translation (2003)
- The Beguiled (2017)

And to better understand the background of the concept, the interview data, articles from magazines, books and other relevant information on the internet were used. Research to explore and analyze to cover all dimensions related to research in various areas mentioned.

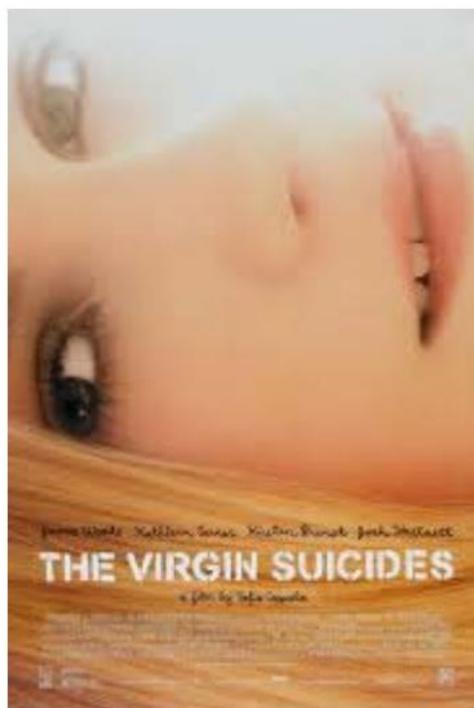
Research Results

The research results can be divided into 3 parts, based on the research of Sofia Coppola's three films:

1. The Virgin Suicides (1999)
2. Lost In Translation (2003)
3. The Beguiled (2017)

It was noticed that the characters in the movies of Sophia Coppola were often drifting like a dream. Through the world, reflect on what was the conflict and the crisis they are facing, her movie often repeatet shots.

The Virgin Suicides (1999)

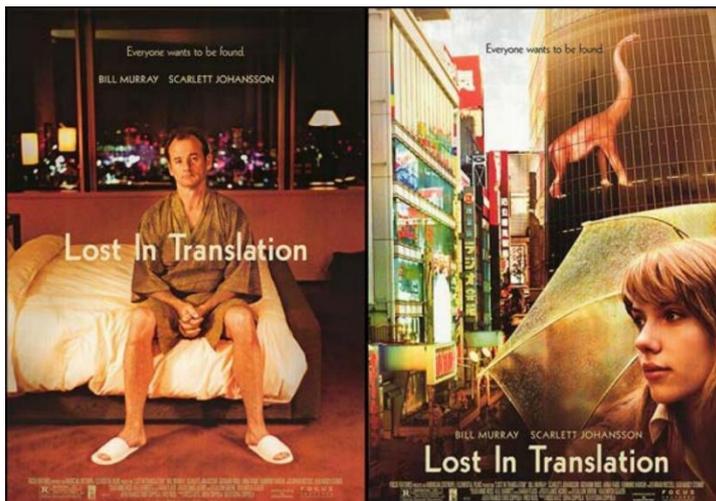


Under strict rules from parents, the girls' big house is almost the same as the jail cell that imprisons their teenage spirit. The spirit is full of imagination, dreams, hopes, love and sexual desire. This loneliness and alienation is difficult to cope with for a life of growth and change. As the stories mentioned above, it is told through the eyes from the other side of the neighborhood. A young man who does not associate with the world of the opposite sex wanted to communicate with a group of young girls by using things around the girl.



Sophia has used the term latent, especially about Catholicism, in this film. The Lisbon family is very strict. Sophia was wheeled by using sexual desire rather than faith. I like the passion that people want, and the death of the young daughter of a house in Lisbon like freedom in everything from this house. The house is like a white nick of Lisbon girls. It is warm family from the outside, but within the pressure. The use of green in Sofia's films means danger.

Lost In Translation (2003)



It was the story of two foreigners meet in a foreign country with the main character. 'Bob Murray' (Bill Murray), middle-aged actor who is tired of my wife. He also has to pick up adverts in which he feels uncomfortable in Japan, and 'Scarlett Johansson,' a graduate student in philosophy. Follow the husband who is a photographer to work in Japan. The husband had to work all day, so there was no time for her. The only time she is alone is to feel lonely in a land where she cannot communicate herself with other people. Both 'Bob' and 'Charlotte' are the same. 'Feeling alone' bored in Japan When the two begin to tear. See each other often to tie together, so they agreed to go out. 'Create Your Own Space' in Japan

This film of Sophia Coppola does not emphasize the depth of the movie. She just creates two characters up to the people to see the loneliness can make this plot as two friends to decrease each other loneliness, and to purely emotionally live. This film is a movie of Sophia, which is a very good film. To convey the emotions to people can fully know the knowledge. The depiction of a bored character replaces the feelings of the characters without any narration or projection of the awkwardness of the characters in the language they themselves do not understand. Even when both of them get together, they do not even have to rely on dialogue. So the movie focused on this movie will get a good screenplay without focusing on the plot is not so strange.



The Beguiled (2017)



Farnsworth is the story of a woman who lives in a boarding school during the Civil War between Northern Division and Southern Division

We will see the conflict between the characters and the environment clearly. The situation at that time was a war. It is very risky for a woman who is alone to service an officer in the army, but they decided to accept it for a number of reasons: humanitarianism. According to religious beliefs and sex drive, it is likely to be more severe than in normal men. At that time, most men went to war. What's wrong? When a young man came in, most women will die in the presence of it. However, in the meantime, the social and cultural conditions of those days did not allow women who had been trained in women to express their sexuality. The female characters in the story are in the midst of an environment that conflicts with their needs and feelings. When everything blows out, it turned out to be disastrous.

The good she has fallen into a house that is long lost man. The young will become 'strange' or 'rare', which makes girls excited. Each of them has own way to lead the men into a 'war of the house' that is unsettled by outside civil war. The conflict between characters is shown. Fighting with the rivalry or simply “Qingdao” under the expression looks like naive. On the other hand, it can be called "fierce" level until the turning point. We do not even wonder how it came to this point because the movie was laid before that each one is not ordinary.

For the conflict between the characters and the environment, as well as the conflict between character and character, the conflict of the movie is inside the character’s mind. This conflict is caused by the fact that the teacher has to hide and keep their emotions. The status quo, when it comes to emotions, it is both amazing and happy together.

The story of this film by Sophia uses the perspective of women in directing women to see each other. This leads to the illusion of need in people and the use of symbolic images. The school gate is like a women's private space.



DISCUSSION

Sophia Coppola's cinematic aesthetics were used to present the view through the eyes of a young woman who looked at each world. Although some content may be very violent, but Sofia Coppola could convey the story in the eyes of women who saw the world should have a story. In the hidden form, the image may not look very intense, but the latent meaning. If the audiences deeply interpreted, it could reflect quite violent.

The character in the movie directed Sophia Coppola was often drifting like a dream. Through the reflection of the world on what was the conflict and the crisis they were facing, her movie repeat shots.

Such as looking out the window at a glimpse of past events, the reliance on the natural light of all Sophia Coppola films gave her a unique signature.

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Cinematography in Wes Anderson’s Films

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ABSTRACT

Objective of this study is to analyze the use of the images in the Movie Wes Anderson, the Director of the unique to the visual equipment. There is no one to compare the study investigator to focus the camera angle and colors that put into the movie.

The results from the study found that the Wes Anderson, selected to use a camera angle that everything must be on, or symmetrical everything must be placed at the center of the frame and the colors option to enter into the movie is that the color set as the basis for creating the world in the Movie several issues.

Keywords: *Cinematography, Wes Anderson*

INTRODUCTION

Composition in the film what is a movie producer, everyone must think of because of composition in the film is the important part that makes the audience. Understand the story through the visual element. If there is no dialogue, the composition it is important very much. And if it is mentioned he nobody know Wes Anderson director with special identity crimes placement of the elements, such as images in the center of the frame and the selection of colorful flashy in the movie.

According to the terms of the composition in the film of Wes Anderson, even people who do not study film can also access to those feelings. The compositions of most objects are placed in the middle frame, also known as the placement of such symmetry whether it is a wide or narrow angle. In addition, an object or objects to present must be in the middle of the frame.

The colors in the movie directed by Wes Anderson is outstanding than the work of the others. Additionally, it is interesting when Wes Anderson choose bright colors in his movie that he has been never fear to choose a color to the color in the film because he put down in the film mostly from private Wes Anderson preference. Some of them are also used primary. Colors entered in films such as, The Life Aquatic with Steve Zissou with main color is blue, red and yellow to communicate the narrative or even the main color tone as pink represents the loveliness bright Wes Anderson a select handful and put it in, The Grandbudapest Hotel.

From the outstanding composition at symmetrical and colorful bright in the film of Wes Anderson, it can bring the researchers’ attention to study the visual of Wes Anderson, a composition greatly.

Objective

To study the Cinematography in Wes Anderson’s films

Scope of the Study

This study selected film 7 about directed by Wes Anderson, that indicates the composition requirement and the colors to choose to use in the film and unique that immersed in the Movie every: Bottle Rocket



(1996), Rushmore (1998), The Royal Tenenbaums (2001), The Life Aquatic with Steve Zissou (2004), The Darjeeling Limited (2007), Moonrise Kingdom (2012) and The Grandbudapest Hotel (2014).

The film of the Westin Anderson have style is a unique image that because they use the director of one all 7 is Robert D. Yeoman To work with Wes Anderson, he is a very well-known from the Movie entitled Moonrise Kingdom taking pictures of his is unique and is a unique id for the Wes Anderson.

Symmetrical Framing

A study of the Cinematography in Westin Anderson Films, which is the placement of the objects of the center of the frame or called the symmetry to give the feeling that the objects, is important and is in the middle as wide angle or narrow angle. In addition, even when the camera moved, objects or things need to be in the middle or must be in alignment is symmetrical.



(The image from the movie, The Grandbudapest Hotel)



(The image from the movie, The Life Aquatic with Steve Zissou)
(The image from the movie, Moonrise Kingdom)



The Color

It is known that The Wes Anderson produces films as if he uses the tray of color to paint a painting the color that he frequently uses in his films is the bright color. Whether it is a Crime drama, it would not result in low quality because most of Westin Anderson’s film color can meet the audiences’ interest.



(The image from the movie, The Grandbudapest Hotel)

The Grandbudapest Hotel directed by Wes Anderson use primary colors, such as pink, purple, blue and red which is out of the mix between a vintage with pastel color, and these colors are used even in the murder movies (e.g., the story of the holster). The director also wise and creative to select the color to make the murder movie has become a movie that is very interesting and not depressed.



(The image from the movie, The Life Aquatic with Steve Zissou)

The Life Aquatic with Steve Zissou employed is blue red and yellow as the main color to attract the most interesting and to the story of the holster.



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(The image from the movie, Moonrise Kingdom)

The color use in Moonrise Kingdom is the green and khaki tones. Wes Anderson selected the color that suited to the media and the love of the character which is most often as a positive, and the love of the teen in the natural ways. Everything in his films seems natural that does not need to be recreated or adjusted.

Slow Motion

The placement of the image and what we will find almost every subject in the films of the Wes Anderson is the use of the slow motion techniques to see up to the action and the feeling of the characters and objects in the movie in the scene.



(The image from the movie, Bottle Rocket)



(The image from the movie, Rushmore)



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(The image from the movie, The Royal Tenenbaums)

Bird's - Eye View

Bird's- eye view of the camera angle is used instead of the eyes of a bird to look from above to come down to the low from the film of the Wes Anderson, we can see that they use this technique throughout in the film that does not make his film strange from other components.



(The image from the movie, The Grandbudapest Hotel)



(The image from the movie, Moonrise Kingdom)



Plan and Tilts

If the camera moves by using this technique, it means that the camera moved by the camera is still in the same position. However, the way to move the camera horizontal direction (i.e., left and right movement), or to use stilts and equipment in moving the camera in a vertical position (i.e., to move up and down by the camera) is also the original style to make Wes Anderson’s films’ interesting and attractive to the audiences.



(The image from the movie, The Royal Tenenbaums)

(The image from the movie, The Darjeeling Limited)

Zoom

Zoom is to make the angle of the image change. For example, an object becomes the larger size by adjusting the focal length, an object becomes smaller size by adjusting the focal length. The less popular use in zooming is the zoom-out technique because it makes the image does not look nice and natural, but Wes Anderson is still used in the skin of his to create excitement.



(The image from the movie, The Life Aquatic with Steve Zissou)



(The image from the movie, Moonrise Kingdom)



(The image from the movie, The Royal Tenenbaums)

Tracking

The track is to move the camera from one location to another by using tracking display or exploring the area by the track. It is different from the plan or the move of the camera because the track will move the camera with the object which we see from the film of the Wes Anderson. He uses the techniques to track the display to add interest to the film.



(The image from the movie, The Darjeeling Limited)



(The image from the movie, Bottle Rocket)



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(The image from the movie, Rushmore)

Book or Text

One of the symbol that found a in the film of the Wes Anderson is that he move the book’s name to be the name of the film so that leading the book fan to become fans of the films.



(The image from the movie, The Royal Tenenbaums)



(The image from the movie, Rushmore)



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(The image from the movie, The Grand Budapest Hotel)

CONCLUSION

According to the study of the Cinematography in Wes Anderson’s Films, it presented that Wes Anderson used different techniques in the film, such as using the image composition, the color of the eye of the audience, the foundation of the tray color and other things. There were also the zoom, plan, track or using the slow-motion to create a technical support to the movie.

Besides, the films directed by Wes Anderson had a unique identity with the beautiful color of the image as well as interesting camera angle that made the films of the Wes Anderson exciting to be studied.

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Antibacterial Activity of Alcohol-Based-Hand Sanitizer Mixed with the *Carissa carandas* L. Fruit Extract

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ABSTRACT

The purposes of this study were to investigate the antibacterial activity of fruit extract of *Carissa carandas* L. and to analyze alcohol-based-hand sanitizers mixed with *C. carandas* L. fruit extract. With regard to research methodology, ethanol was used to extract *C. carandas* L. fruit. The samples were evaluated against 4 strains of human pathogenic bacteria: *Staphylococcus aureus*, *Listeria monocytogenes*, *Escherichia coli* and *Salmonella typhimurium* by broth dilution assay. The finding are that the extract of *C. carandas* L. showed 10 mg/mL against *L. monocytogenes*, *E. coli*, *S. typhimurium* and 7.5 mg/mL minimal inhibitory concentration (MIC) values for *S. aureus*. Minimal bactericidal concentration (MBC) of the crude extract was 30 mg/mL against *S. aureus*, *L. monocytogenes*, *E. coli* and *S. typhimurium*. The MIC of the alcohol-based hand sanitizer mixed with the *C. carandas* L. fruit extract was 5 mg/mL against *S. aureus*, *L. monocytogenes*, *S. typhimurium* and 10 mg/ml of *E. coli*. The MBC of the alcohol-based hand sanitizer mixed with *C. carandas* L. fruit extract was 10 mg/mL against *S. aureus*, *L. monocytogenes*, *S. typhimurium* and 20 mg/mL against *E. coli*. The hand sanitizing product tested in this study is suitable for disease prevention.

Keywords: Alcohol-based-hand sanitizers, Antibacterial activity, Broth dilution assay, *Carissa carandas* L., Human pathogenic bacteria, Minimal bactericidal concentration, Minimal inhibitory concentration

INTRODUCTION

A lot of infectious diseases can be transmitted from one person to another by contaminated hands. The most common are gastrointestinal infections and respiratory infections. Infection of the gastrointestinal tract can be caused by *Staphylococcus aureus*, *Escherichia coli*, *Vibrio cholera*, *V. parahemolyticus*, *Shigella*, and *Salmonella* (Shaloo et al., 2017). Additionally, the main bacteria causing respiratory infections are *Haemophilus influenzae* type b, *Streptococcus pyogenes*, and *S. pneumoniae*. Moreover, Pickering et al. (2011) reported that pandemic and avian influenza are known to be transmitted via human hands. Hence, hand hygiene is one of the most significant activities to reduce the incidence of infection, not only gastrointestinal infections but also respiratory tract in order to protect the skin from harmful microorganisms (Bloomfield, 2007). Different hand-hygiene procedures include either hand washing or alcohol hand-rub. The purpose of hand washing is to remove pathogens and chemicals from hands. Otherwise, they can be harmful or get diseases. This process is generated by rubbing the hands together with soap and water followed by rinsing with water, and drying them thoroughly. The alcohol hand-rub procedure involves the use of alcohol rather than water. It is more effective and can reduce a large number of viable pathogenic microorganisms rapidly. Although soap is



widely obtainable, washing hands with soap is not practicable every time due to unreliable quantities of available water supplies (Wolf-Peter et al., 2009). Hand sanitizers (HS), also called antiseptic hand-rub or hand rub are commonly used as an alternative to hand washing with soap and water. Hand sanitizers are typically in the forms of foam, gel, or liquid. Hand-sanitizer products can be classified into two types dependent on active ingredients: alcohol-based and alcohol-free.

Alcohol-based hand sanitizers can eliminate 99.9% of common microorganisms. According to the Centers for Disease Controls (CDC)'s report, sanitizer with alcohol typically contains between 60 - 95 percent alcohol. At these concentrations, alcohol can immediately denature proteins, effectively killing certain types of germs. For preparation of alcoholic hand sanitizers (AHS), ethanol, isopropanol, and/or n-propanol are used (Pickering et al., 2011).

On the other hand, non-alcoholic hand sanitizer (NAHS) is mainly based on disinfectants/ antimicrobial agents such as Benzalkonium chloride (BAC) or Triclosan. BAC is primarily used as a preservative and antimicrobial agent, and secondarily used as a surfactant. Triclosan is a Polychloro phenoxy phenol with antibacterial and antifungal activity. It is widely used as a preservative and antimicrobial agent in personal care products. Since alcohol has a drying effect, many of these products contain emollients to make them gentler on the skin.

Herbal hand sanitizers are natural plant-based alternatives to chemical sanitizers. Many plants contain a wide range of phytochemicals proved beneficial and have biological activity such as anticancer, anti-inflammatory, antimicrobial, antifungal, antiviral, antioxidant, and wound healing activity. The advantage of using herbal drugs is that they tend to be inexpensive compared to drugs and easily available. Herbal cosmetics are the modern trend in the field of beauty and fashion. The demand of herbal medicines is increasing rapidly due to their skin friendliness and lack of side effects. Most women prefer natural products to chemicals for their personal care to enhance their health and beauty.

Carissa carandas L. has been described to have antibacterial activity against some human pathogenic bacteria. For example, Gram-negative includes *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Escherichia coli*, *Acinetobacter baumannii*, and Gram-positive includes *Enterococcus faecalis*, and *Staphylococcus aureus* methicillin-resistant. This effect has been attributed to different parts of the plant, such as the leaves, flowers, seeds, roots, fruit peel and unripe pods. Verma and Chaudhary (2011) reported that leave and fruit extracts of *C. carandas* have varied antimicrobial activity against *E. coli*, *Staphylococcus epidermidis*, *Enterococcus* sp., *S. aureus* and *K. pneumonia*. The dichloromethane extract from *C. carandas* fruit was most active against *E. coli*. Fruit extract of *C. carandas* in chloroform also showed the maximum activity against *K. pneumonia*. Ethyl acetate extract of fruit displayed antibacterial activities against the all bacterial strains used in this study. Additionally, methanolic extract of *Carissa carandas* L. fruit exhibited antibacterial activities against *Vibrio cholera*, *S. aureus*, *E. coli* and *K. pneumoniae* (Kankamol, 2015). Furthermore, the *C. carandas* fruit juice was determined against 4 strains of human pathogenic bacteria: *S. aureus*, *E. coli*, *Bacillus subtilis*, and *Salmonella typhimurium* by agar well diffusion assay. The finding showed that the *C. carandas* fruit juice exhibited good inhibitory activity against all these bacterial strains (Achayuthakan et al., 2018). These results indicated that the ethanolic extract of *Carissa carandas* L. fruit might have important compounds that could be used for the treatment of bacterial infection. Thus, the purposes of this study were to investigate the antibacterial activity of fruit extract of *C. carandas* L. to analyze alcohol-based hand sanitizers mixed with *C. carandas* L. fruit extract.



MATERIALS AND METHODS

1.1 Plant Material

The fresh ripe undamaged fruit of *Carissa carandas* L. was collected from Umpawa District, Samosongkram Province, Thailand in November, 2016. The sample was cleaned by tap water 3 times, seeds were removed, and the flesh fruit was dried in hot air oven at 42 °C for 3 days. The dried fruit was then ground into powder and stored in air-tight plastic container at 4°C for further investigation as shown in (Figure 1)



Figure 1 *Carissa carandas* L. fruit

1.2 Preparation of the Extract

The powdered sample material (200 g) was extracted with ethanol (500mL) by maceration at room temperature for 7days, stirring several times throughout the process. After filtering through a filter paper (Whatmann size no.1), the ethanol extract was concentrated in a rotary evaporator to yield an ethanol extract. The extract was kept in a sterile bottle, under refrigerated conditions for further use.

1.3 Bacterial strains

The reference bacterial strains used in this study were purchased from National Institute of Health of Thailand.

Antimicrobial activities were determined against two Gram-positive bacteria including *S. aureus* (ATCC 25923) and *Listeria monocytogenes* (DMST 17303), and two Gram-negative bacteria including *Salmonella* Typhimurium (ATCC 13311) and *Escherichia coli* (ATCC25922).

1.4 Determination of the minimum inhibitory concentrations (MIC) and minimum bactericidal concentration (MBC)

Antibacterial activity was analyzed by the method of broth microdilution (Santos et al., 2012). Initially a stock solution of 100 mg/ml of the extract of *Carissa carandas* L. was prepared using an aqueous solution of 10% DMSO (v/v). A hundred µl of the extract had been transferred to the sterile 96-well microtitre plate containing 100 µl of Müller-Hinton broth. Then, serial dilutions of the extract were prepared at concentrations of 100, 50, 25, 12.5, and 6.25 mg/mL. Inoculum containing 5×10^5 CFU ml⁻¹ was added to each well. Wells in microplate have been dedicated to sterility control of the broth, bacterial growth and action of antimicrobial reference (Ampicillin). Microplates were incubated under conditions of aerobically for 16 h at 37°C. Five µl of 2,3,5-triphenyl-tetrazolium (CTT) 0.5% 2,3,5-triphenyl tetrazolium chloride (TTC) were added to each well to detect the color change of the CTT (colorless) to red, reflecting the bacterial metabolism as active. The MIC was defined as the lowest concentration of the sample that visibly inhibited bacterial growth. The MBC was determined according to the method of (Rios et al., 1988). Briefly, 100 µL from each well (without any red dye



production) was sub-cultured on the Mueller Hinton agar plates and incubated for 24 h at 37°C. The lowest concentration without any bacterial growth was represented as MBC.

1.5 Formulation of Herbal-Hand Sanitizer

Carbopol was added to deionized water with constant stirring. After uniform mixing, triethanolamine (TEA) was added with slow stirring to avoid formation of possible air bubbles in the product and kept aside for 24 hrs. The *Carissa carandas* L. fruit extract was added to denatured alcohol along with glycerine. Finally, 0.4% of perfume was added and mixed with slow stirring to obtain uniform product (Table 1). Prepared product was stored in air tight containers as shown in Figure 2.

Table 1. Formulation and Composition of Alcohol-Based- Hand Sanitizer Mixed with the *Carissa carandas* L. Fruit Extract

No.	Ingredients	Quantity given (%)	Quantity taken(gm/ml)	Uses
1	Deionized water (mL)	44	22	Vehicle
2	95% Ethanaol (mL)	46	23	Antibacterial
3	<i>Carissa carandas</i> L. fruit extract in glycerine	6	x	Antibacterial Emollient
4	Carbopol 940 (g)	3.2	1.6	Thickening agent
5	Triethanolamine (TEA)	0.4	0.2	Solubilizing agent
6	Perfume (µL)	0.4	0.2	Fragrance

RESULTS AND DISCUSSION

Antibacterial activity was examined against four reference bacteria which were two Gram-positive and two Gram-negative as presented in Table 2 using MIC and MBC broth microdilution methods. The *Carissa carandas* L. fruit extract displayed a higher activity against Gram-positive strain. As shown in Table 2, the most susceptible strain was *S. aureus* (MIC = 7.5 mg/mL, MBC = 30 mg/mL) and *L. monocytogenes*, *S. typhimurium* and *E. coli* (MIC = 10 mg/mL, MBC = 20 mg/mL). In the current study, *S. aureus* (Gram-positive bacteria) was more susceptible as compared to Gram-negative bacteria. These differences might be attributed to fact that the cell wall in Gram-positive bacteria was of single layer, whereas, the Gram-negative bacteria cell wall was multi-layered structure. The transport of the active compound through the Gram-negative cell wall might be inhibited. The outer membrane of Gram-negative bacteria was rich in hydrophilic lipopolysaccharides (LPS) which acted as a barrier against penetration of hydrophobic compounds. Owing to this structural property, Gram-negative bacteria exhibited a higher degree of resistance against hydrophobic antimicrobial compounds (Hashemi et al., 2013).

The antibacterial activity using well-diffusion method displayed that the formulation of alcohol-based-hand sanitizer having *Carissa carandas* L. fruit extract gave higher activity than alcohol-based-hand sanitizer without extract (data not shown). Hence, *Carissa carandas* L. fruit extract was the major constituent in alcohol-based-hand sanitizer. The better activity of prepared formulation might be due to the combined activity of phytoconstituents present in the extract. The result from the present work supported the incorporation and utilization of *Carissa carandas* L. fruit extract in the formulation to give better effect.



From the current experimental results, the antibacterial activity of herbal-hand sanitizer (alcohol-based-hand sanitizer mixed with the *Carissa carandas* L. fruit extract) demonstrated higher antibacterial activity than the formulations with no fruit extract. The data showed that herbal-hand sanitizer was a broad spectrum for different bacterial kinds tested. The inhibition by the *Carissa carandas* L. fruit extract could be due to the presence of active constituents such as terpenoids, flavonoids, alkaloids, glycosides, saponin, tannins, carbohydrates, and sterols (Mishra et al., 2013; Panche et al., 2016). Flavonoids had been recognized for their antimicrobial activity. Several studies had been carried out to isolate and identify the structures of flavonoids that it exhibited several biological effects such as anti-inflammatory, anti-hepatotoxic, anti-ulcer actions, antifungal, antiviral and antibacterial activity (Panche et al., 2016; Cushnie & Lamb, 2005; Rajanarayana et al., 2001). Moreover, plant terpenoids played an important role in traditional medicines and were under investigation for antineoplastic, antibacterial and other pharmaceutical functions. Mariajancyrani et al. (2006) reported that the terpenoid extracted from the leaves of *Bougainvillea glabra* choicy exhibited high antibacterial activity against two Gram-positive bacteria: *Streptococcus mitis* and *Lactobacillus sp.* by observing the zone of inhibition. Flavonoids and terpenoid were chemical compounds which had antibacterial and antioxidant properties, and this might explain the bacterial reduction when using *Moringa oleifera* as a hand washing product.



Figure 2. Alcohol-Based-Hand Sanitizer

Table 2. Minimum Inhibitory Concentrations (MICs) and Minimum Bactericidal Concentrations (MBCs) of the Alcoholic Fruit Extract of *C. carandas* L. and Alcohol-Based-Hand Sanitizer Mixed with Alcoholic Fruit Extract of *C. carandas* L.

Strain	Ethanolic fruit extract of <i>C. carandas</i> L.		Alcohol-based-hand sanitizer mixed with ethanolic fruit extract of <i>C. carandas</i> L.	
	MIC (mg/mL)	MBC (mg/mL)	MIC (mg/mL)	MBC (mg/mL)
<i>Staphylococcus aureus</i>	7.5	30	5	10
<i>Listeria monocytogenes</i>	10	30	10	20
<i>Salmonella</i> Typhimurium	10	30	10	20
<i>Escherichia coli</i>	10	30	10	20



The fruit, leaves, barks, and roots of *C. carandas* had been used for ethnomedicine in the treatment of human diseases, such as diarrhea, stomachic, anorexia, intermittent fever, mouth ulcer and sore throat, syphilitic pain, burning sensation, scabies, and epilepsy (Begum et al., 2013). Additionally, *C. carandas* fruit had antimicrobial and antifungal properties (Kumar et al., 2013).

C. carandas fruit had been reported that it contained carisol, epimer of α -amyrin, linalool, β -caryophyllene, carissone, carissic acid, carindone, ursolic acid, carinol, ascorbic acid, lupeol, and β -sitosterol. Ethnopharmacological significance of the plant had been ascribed due to anticancer, anticonvulsant, antioxidant, analgesic, anti-inflammatory, and DNA damage inhibition (Singh & Uppal, 2015). Phytoconstituents presented in unripe fruit extracts of *Carissa carandas* L. demonstrated the presence of alkaloids, flavonoids, glycosides, saponin, tannins, carbohydrates, sterols, and terpenoids (Mishra et al., 2013; Panche et al., 2016).

CONCLUSION

In this study, ethanolic fruit extract of *C. carandas* L. and the prepared formulation of alcohol-based-hand sanitizer containing ethanolic fruit extract of *C. carandas* L. were active against 4 strains of human pathogenic bacteria: *Staphylococcus aureus*, *Listeria monocytogenes*, *Escherichia coli* and *Salmonella typhimurium*. Higher inhibitory effects of the samples were found against *S. aureus*. It could be concluded that alcohol-based-hand sanitizer containing ethanolic fruit extract of *C. carandas* L. had a significant antibacterial effect on the specified microorganisms

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Changes in Lipids of Boiled Dried Anchovy (*Stolephorus heterolobus*) during Practical Industrial Drying

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ABSTRACT

The purpose of the study aimed to investigate the effects of drying time on lipid oxidation in boiled dried anchovy. Lipids were extracted from boiled dried anchovy after various drying times to measure lipid oxidation and changes in lipid composition. The pH slightly decreased during the drying period ($p \geq 0.05$). Peroxide value (PV) of lipid increased rapidly within 6 hours ($p < 0.05$) and then gradually increased up to 12 hours of drying. The accumulation of secondary oxidation products (p-Anisidine values, p-AV) was stable for 6 hours of drying ($p \geq 0.05$) and then increased significantly up to 12 hours of drying ($p < 0.05$). During drying, no significant changes were observed in total lipid throughout the drying period ($p > 0.05$). With increasing drying time, triglyceride (TG) and phospholipid (PL) contents decreased but free fatty acid (FFA) content significantly increased ($p < 0.05$). Increase of FFA with decrease in triglyceride (TG) content was observed in proportion to drying time, suggesting that hydrolysis was induced during drying. These results suggested that during drying period lipid oxidation occurred along with hydrolysis.

Keywords: Oxidation, Hydrolysis, Drying, Anchovy

INTRODUCTION

Anchovy (*Stolephorus heterolobus*) is one of the most important fish species in Thailand because it has higher levels of essential fatty acids and protein than other fish species. The annual catch of anchovy in Thailand has increased from 57,800 ton in 1987 to 138,600 ton in 2010. In Thailand, most of the anchovy is captured for raw materials to produce boiled and dried products. Drying is the most common method of fish preservation. In many developing countries dried salted fish is an important source of low-cost dietary protein. The main problems associated with dried salted fish are variable, but often low quality of final products induced by the rapid rate of deterioration during processing of distribution and storage (Maruf, Ledward, Neale, & Poulter, 1990). The boiled dried anchovy was prepared from anchovy in Andaman coast of Thailand. The processing consisted of anchovy cooking in brine followed by drying until the moisture content of dried products was approximately 10-15%. Changes in lipid during processing, such as lipolysis and lipid oxidation in fish muscle, were associated with quality deterioration (Pacheco-Aguilar, Lugo-Sánchez, & Robles-Burgueno, 2000). Initiation and propagation of lipid oxidation were catalyzed by exposure to oxygen and exposure to light, and when oxygen was presented, the decomposition of unsaturated fatty acid occurred more readily (Maruf et al., 1990). It was reported that the volatile compounds produced by lipid oxidation were primarily responsible for the



development of the typical flavor during ripening of anchovy (Pegg, 2011). However, the relationship between lipolysis and lipid oxidation in boiled dried anchovy during drying remains unclear. Therefore, the aim of this study was to investigate the changes in hydrolysis and lipid oxidation in boiled dried anchovy during drying.

METHODS

Fish sample

Anchovy (*Stolephorus heterolobus*), approximately 4.5–5 cm in length were captured in the Andaman coast. The anchovy was frozen while at the sea at -18 °C and transported while kept at -18 °C. The average moisture content was 75.54±2.21%. The processing consisted of anchovy cooking in brine (25% w/v) for 15 min, followed by drying in an industrial convective drier (controlled to 70 °C and air velocity 2 m/s) for 12 hours. Drying experiments were run three times.

Determination of pH

pH was measured as described by Young (1992). Anchovy was homogenized in deionized water which the pH was determined using a pH meter.

Total lipid extraction

Total lipid extraction of anchovy muscle was done according to method of Folch et al. (1957) using a mixture of chloroform and methanol (2:1, v/v). Total lipid was kept under nitrogen gas in brown vial glass at -20 °C until it was analyzed.

Determination of peroxide value (PV)

Peroxide value (PV) was analyzed according to method of Pegg (2001) using xylenol orange and iron (II) chloride solution. The supernatant was measured for absorbance at 560 nm. PV was expressed as meq active oxygen per kg lipid.

Determination of p-Anisidine Value

p-AV was determined according to AOCS Recommended Practice Ti 1a-64 (AOCS, 1990) using *p*-Anisidine in acetic acid and measuring the absorbance at 350 nm.

Determination of Lipid Composition

Changes in lipid composition were analyzed by thin-layer chromatography with flame ionization detection model TLC-FID according to the method of Chotimarkorn et al. (2009). Composition of lipids was estimated from peak areas as percentages of total peak area.

RESULTS AND DISCUSSION

Changes in pH of boiled dried anchovies muscle during drying were shown in Figure 1. In this study, the pH decreased throughout the drying period from 6.51±0.32 to 5.23±0.27. This might be due to the free fatty acids produced by hydrolysis. Similarly, decreasing pH during drying of several fish species had been reported earlier (Nakagawa, Noto, Yasokawa, & Kamatani, 2007; Azad Shah, Tokunaga, Kurihara, & Takahashi, 2009).

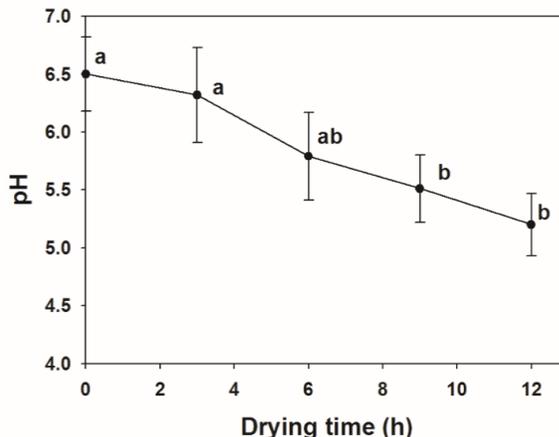


Figure 1. Changes in pH of anchovy muscle during drying for 12 hours at 70 °C. Values as shown were mean ± SD (n=3). Different letters indicated significant differences ($p \leq 0.05$).

Oxidation and hydrolysis of fish lipid during processing and storage resulted in rancidity and texture changes that reduced acceptability of fish products. The initial PV of boiled dried anchovy was 2.01 ± 0.23 meq/kg lipid and drying caused significant lipid oxidation with a significant increase in PV to 10.27 ± 0.47 meq/kg lipid (Figure 2) by the end of drying. A rapid increase in PV was noticeable during 0-6 hours of drying ($p < 0.05$) and then a slight increase took place from 6 hours onwards ($p \geq 0.05$). As lipids were oxidized they form hydroperoxides, which were susceptible to further oxidation, forming products, such as aldehydes and ketones that affect flavor (Hamilton, Kalu, Prisk, Padley, & Pierce, (1997).

Secondary lipid peroxidation was measured using *p*-AV. In the current study, the initial boiled dried anchovy had *p*-AV content of 0.54 ± 0.13 that remained nearly constant during 6 hours of drying ($p \geq 0.05$). After that, a significant increase in *p*-AV to 2.45 ± 0.12 was observed from 6 hours of drying until the end of drying ($p < 0.05$) as shown in Figure 3. The increase in *p*-AV during drying might be attributed to partial dehydration and increased oxidation at high temperature. One potential reason for secondary lipid peroxidation products was that the rate of lipid peroxide decomposition exceeded the rate of their production, so that the secondary lipid peroxidation products, such as aldehydes, increased rapidly (Gal, Pinchuk, & Lichtenberg, 2003). This study suggested that lipid hydroperoxide decomposition in boiled dried anchovy during drying exceeded the rate of formation after 6 hours of drying at 70 °C, for up to 12 hours.

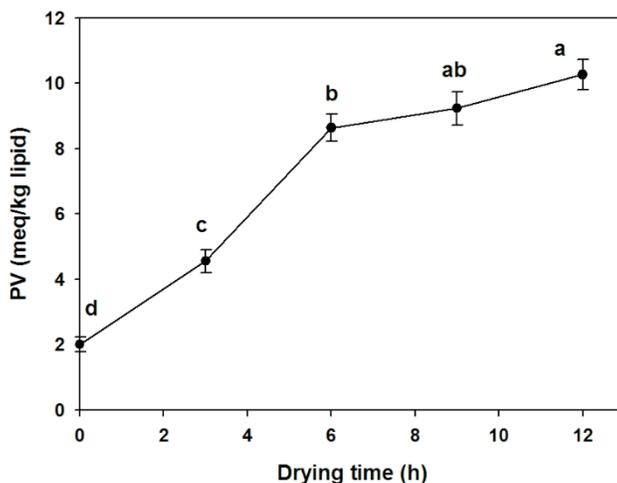




Figure 2: Formation of PV in anchovy muscle during drying for up to 12 hours at 70 °C. Values shown were mean ± SD (n=3). Different letters indicated significant differences (p≤0.05).

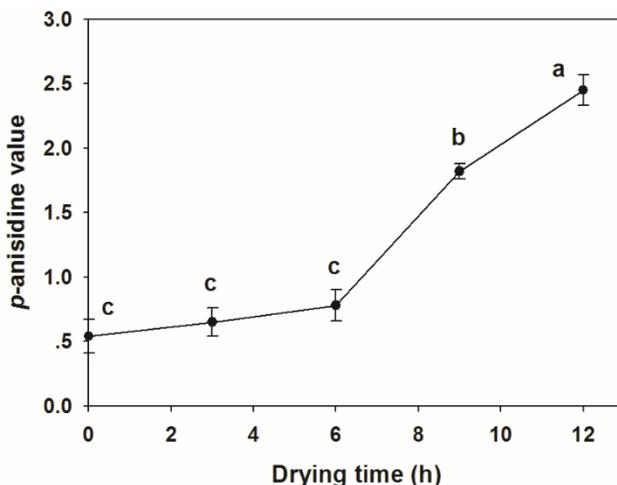


Figure 3: Formation of p-AV in boiled dried anchovy muscle during drying at 70 °C. Values shown were mean ± SD (n=3). Different letters indicated significant differences (p≤0.05).

The total lipid content in boiled anchovy was 13.64±0.26%. During drying, no significant changes were observed in total lipids throughout the drying period (p≥0.05). The extracted lipid was separated into the different lipid classes TG, PL and FFA. Changes in lipid classes of boiled dried anchovy during drying were shown in Table 1. In the current study, the major component in total lipids of anchovy muscle was TG. The initial TG and PL fractions in boiled dried anchovy were 74.13±1.23 and 15.67±0.76% respectively. TG and PL contents decreased to 67.24±1.65 and 9.44±0.88% (p<0.05) on drying for 12 hours. Decrease in TG and PL contents was probably due to enzyme hydrolysis (Hwang, & Regenstein, 1993). Thus, it was suggested that hydrolysis of lipids by lipase and phospholipase had taken place in boiled dried anchovy muscle and these enzymes in boiled anchovy muscle were deactivated. The formation of FFA was generally associated with enzymatic activity in fish muscle leading to hydrolysis. In the current study, FFA contents rapidly increased (p<0.05) from the initial value of 1.25±0.45 to 13.12±0.88% during 12 hours of drying (Sikorski, Kolakowska, & Burt, (1990). The relationship of hydrolysis of TG and PL with lipid oxidation was still under discussion.

Table 1: Total lipid and fractions (in % of total) of lipid classes of in boiled dried anchovy during drying

Drying time (h)	Total lipid	TG	PL	FFA	Unknown
0	13.64±0.26	74.13±1.23a	15.67±0.76a	1.25±0.45e	8.72±0.21
3	12.75±0.56	72.34±1.41b	13.23±0.78b	4.56±0.32d	9.41±0.36
6	14.32±0.47	71.21±0.98ab	12.12±0.66bc	7.64±0.56c	9.02±0.19
9	13.65±0.74	69.73±1.45b	10.54±0.94c	10.68±0.94b	9.01±0.41
12	12.93±0.43	67.24±1.65c	9.44±0.88c	13.12±0.88a	10.21±0.45

TG: triglyceride; PL: phospholipid; FFA: free fatty acid. Values in the same column with different lower-case letters were significantly different from each other at p < 0.05.



The current study showed that boiled dried anchovy which was industrially produced in Thailand experienced significant lipid peroxidation and hydrolysis. This fish product was widely consumed in Thailand. Overall the results indicated that drying of boiled dried anchovy directly caused lipid oxidation and hydrolysis. On the basis of this information, it was highly recommended that commercial and practical industrial drying methods of anchovy should be changed in order to decrease lipid oxidation and hydrolysis.

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Local Food Recipes for Health in Pa Sao Community by Community Participation

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ABSTRACT

This study aimed to find out healthy local food context derived from local wisdom of Pa Sao Community by using community-based participatory study. In-depth individual interview was adopted in this research, and data was collected through in-depth interview of 20 informants about popular local food, unique local food, festival food, rare traditional, and the medical food. It was found that banana tree trunk curry (Kaeng Yuak Kluyay), cassia leaf curry (Kaeng Kee Lek) and rice noodle with fish curry sauce (Kanom Jean Namya) were mentioned by most informants in the interviews. For the case of local wisdom transfer, it was done through memorizing and observing how local experts cooked in important events in the community. Moreover, for the case which was about raw ingredients and local vegetables, it was found that the ingredients were obtained from natural sources and markets.

Keywords: *Local Food, Pa Sao Sub district, Participation*

INTRODUCTION

Pa Sao Sub district in Uttaradit Province is rich of resources for agriculture. More than 70 percent of the population in the area is in agricultural occupation. Since Nan River runs through the area all year long, it benefits farming in the area and the nearby areas. Agricultural products from the area are main sources of food, such as rice, beans, and vegetables. Since Pa Sao is located just 8 kilometers from the center of Uttaradit City, it is a semi-rural semi-urban area that conveniences are within reach. Therefore, food consumption in the community is diverse and different from the past practices. Local food consumption has been declined and replaced by pre-cooked or ready-to-eat food.

Nowadays, Thai people have realized the importance of cultural aspects of Thai food and desserts consumption, especially, local food production and consumption. This does not only helps promote sustainable ways of life but also reserves the culture of the community. Thai food culture is unique and healthy. Consuming Thai set dishes including the combination of rice, side dishes and desserts is diverse in flavors and nutrition which come from vegetables, herbs, and meat.

The study of values of Thai food by Charoenkiatkul, Dissayabutr, Thitatan, Ruamruk & Boonpradern (2005) showed that Thai food had potential to be developed to healthy food. Therefore, the importance of Thai food on good health should be studied and promoted to Thai people. Standard recipes of Thai food should also be developed and collected, both for recipe conservation and adaptability. In addition, roles of local food on good health should be studied to assist consumption and export of Thai food.

The study of nutritional status of elderly in Pa Sao sub district in Uttaradit Province which was a semi-rural semi-urban area of DangJai, Chaima, and Wongdokmai (2017) showed that 54.14 percent of the elderly in the



area was at risk of malnutrition which resulted from changes of food consumption behavior. Pa Sao is an old community in which people in the community consume and cook local food both on daily basis and on important religious ceremonies. This leads to conservation of local wisdom of rare local dishes in the area and development the dishes to be healthier which will benefit the people in the community, especially the ones who have malnutrition. These people have local wisdom but they lack of methods of achieving recipes. Consequently, a study for the method needed to be done, with a community participation, to conserve the local dish recipes for the next generation and for development of healthy local food.

OBJECTIVES

1. To find out local dishes in Pa Sao Sub district by using participatory community based methods
2. To create local dish recipes

METHODS

Research Processes

1. Conducted a field study to find out basic information of Pa Sao Sub district and food consumption culture of people in the area.
2. Designed the research conceptual framework.
3. Collected data by the use of the following tools:
 - 3.1 In-depth interview questionnaire with local wisdom scholars on local food and ingredients from the area,
 - 3.2 A questionnaire with local people on popular dishes,
 - 3.3 Participatory meetings between researchers, community leaders, local wisdom scholars and the people in the community about local dishes, raw ingredients, and food consumption behaviors.
 - 3.4 Record the conversation for further data analysis.
4. Analyzed data and selected 20 most popular dishes among the informants in Pa Sao.

Key Informants

1. In-depth interview key informants were 20 food specialists and local wisdom scholars selected by purposive sampling.
2. Consumer acceptance key informants for 20 local dish recipes were 3 food specialists and local wisdom scholars for each recipe.

Research Instruments

1. An in-depth interview questionnaire on local dishes, raw ingredients, and food consumption behavior in Pa-Sao Community.
2. A questionnaire on popular local dishes in Pa-Sao.
3. A consumer acceptance questionnaire with hedonic facial scale of 7 points used in the sensory analysis.



Data analysis

1. Data were analyzed and synthesized from the interview questionnaire and the participatory meetings.
2. An ordinal scale was applied to determine the people’s preferences on local dishes.
3. A sensory evaluation test was used to assess preferences on each local dish including 3 evaluators for each recipe using a 7-point hedonic facial rating test on smell, taste, external appearance, texture, and color.

Statistical Data Analysis

Descriptive data analysis was used to describe the data. Ordinal scales and descriptive statistics, such as percentage, means and standard deviations were also applied to analyze the data.

RESEARCH FINDINGS

The results of the study were found that:

1. Types of Local Dishes

1.1 Popular dishes: Banana stem curry is the most popular dish among the people in Pa Sao community followed by green curry and fish curry paste as the second most popular. The third place of the popular dishes are fish sour curry, mixed vegetables curry, fermented soy bean and coconut milk dip, fish in dried red curry, banana flowers spicy salad, grilled fish chili paste, traditional padthai, rolled noodle soup, cassia leave curry, spiced mixed-vegetable soup, spicy stir-fried pork, spicy snakehead fish soup, rice noodle with Thai curry, spicy bamboo shoot soup, spicy minced fish salad, Thai fresh water snail curry, spicy blood and minced pork salad.

1.2 The unique local dishes of Pa Sao sub district are banana stem curry, chili paste with boiled mixed vegetables, green curry, spicy bamboo shoot soup, spicy young banana salad, rolled noodle soup, and rice noodle with Thai curry.

1.3 Festival dishes are traditional padthai, rolled noodle soup, stir-fried rice noodles, rice noodle with Thai curry, red curry, green curry, spiced stew with sweeten brown soup, green taro curry, cassia leave curry, banana stem curry, clear soup, spicy soup, mung bean custard, mung bean stuffed dough pyramid, steamed sticky rice wrapped in banana leaves, and steamed flour with filling wrapped in banana leaf.

1.4 Rare traditional dishes are spicy Thai puffball mushrooms soup, spicy sweet juice soup, glinus herniarioides soup, stir-fried rice noodle in coconut milk, spicy young banana salad, young banana curry, and shrimp paste and chili soup.

1.5 Local healthy dishes which keeps good diet are banana stem curry, cassia leave curry, spiced mixed-vegetable soup, eel curry, spicy stir-fired with eels, boiled Siamese neem with sweet sauce, and other dishes which are mainly made from herbs such as galangal, lemongrass, white turmeric, turmeric, fresh peppercorn, finger root, long pepper, holy basil and sweet basil.



1.6 Knowledge transfer of local dish was done through memorizing and observation from the people who cooked in important festivals in the community and through teaching students in the schools in the community.

1.7 Raw ingredients, frequently found, and distinct vegetables which could be divided into 3 categories are:

- A. Meat can be gained from 2 sources: natural sources and markets
 - Meat from natural sources, such as snakehead fish, eel, catfish, fresh water snail, golden apple snail, fresh water fish and other wild animals.
 - Meat from markets, such as chicken, pork, beef, and seafood
- B. Vegetables can be gained from 2 sources:
 - Vegetables from natural sources and backyard gardens, such as banana stem, banana flower, climbing wattle or acacia, betel leaf, cassia, green taro, Ceylon spinach, ivy gourd, Melientha suavis Pierre (pak-wan pa), vegetable fern, morning glory, eggplant, Turkey berry, bamboo shoot, fresh chili, moringa, long bean, and Thai zucchini.
 - Vegetables from markets, such as general economic vegetables (Chinese morning glory, white cabbage, long bean, cucumber, Chinese kale, tomato and baby corn).
- C. Herbal vegetables
 - Galangal, lemon grass, kaffir lime leaves, finger root, turmeric, white turmeric, basil, sweet basil, long pepper, and green pepper.

2. Developed Recipes

Twenty dishes selected by people in Pa-Sao community were then developed the recipes and able to be categorized into the following 5 types:

Figure 1.

9 Dishes of Curry Category

A. Curry: 9 recipes are banana stem curry, green curry, fish sour soup, cassia leave curry, mixed vegetable curry, spiced mixed-vegetable soup, snakehead spicy soup, spicy bamboo shoot soup, and Thai fresh water snail curry.





Figure 2.
3 Dishes of Dip Category



B. Dip: 3 recipes are fish chili paste with boiled mixed vegetables, fermented soy bean and coconut milk dip, and grilled fish chili paste.

Figure 3.
3 Dishes of Salad Category



C. Salad: 3 recipes are spicy banana flower salad, spicy minced fish salad, and spicy blood and minced pork salad.

Figure 4.
2 Dishes of Salad Category



D. Miscellaneous dishes: 2 recipes are fish in dried red curry and spicy pork stir-fried.

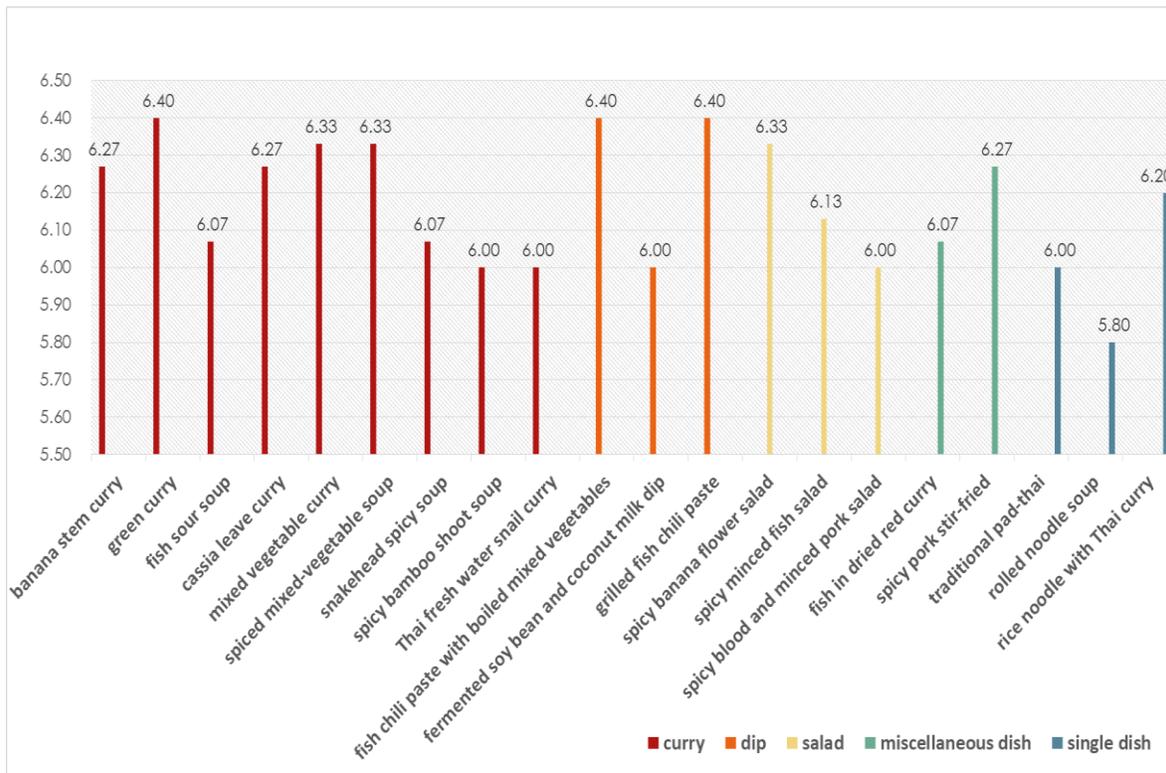


Figure 5.
3 Dishes of Salad Category



E. Single dish: 3 recipes are traditional padthai, rolled noodle soup, and rice noodle with Thai curry.

Figure 6.
Sensory Evaluation Test Result of 20 Dishes



When examined with consumer acceptance test by 3 food specialists and local scholars, it was found that, among curries and soup, green curry was rated the highest (at average level, 6.40). Fish chili paste with boiled



mixed vegetables and grilled fish chili paste were rated the highest among dips (at 6.40). For salads, spicy banana flower salad was rated the highest among them (at 6.33). Spicy pork stir-fried was rated the highest among miscellaneous dishes (at 6.27). Lastly, rice noodle with Thai curry was rated the highest among all single dishes (at 6.20).

SUMMARY AND DISCUSSION

1. The first objective of this study sought to find out local dishes in Pa-Sao Sub district in Muang District, Uttaradit Province by using participatory community based method.

1.1 It was found that banana stem curry was the most frequently mentioned dish by the informants. This was followed by green curry and fish curry paste as the second most frequently mentioned dishes. The third group of dishes which were mentioned frequently were fish sour curry, mixed vegetables curry, fermented soy bean and coconut milk dip, fish in dried red curry, banana flower spicy salad, grilled fish chili paste, traditional padthai, rolled noodle in spiced brown soup, cassia leaf curry, spiced mixed-vegetable soup, spicy stir-fried pork, spicy snakehead-fish soup, rice noodle with Thai curry, spicy bamboo shoot soup, spicy minced fish salad, Thai fresh water snail curry, spicy blood and minced pork salad. It is interesting to note that the dishes mentioned can be found in the form of prepared food in local markets and food stalls. This confirms that the raw ingredients, such as vegetables and meat are easily found, and the cost of these raw ingredients are not high. The result is also evident that the dishes mentioned, such as banana stem curry is one of the Uttaradit cultural cuisine.

1.2 The result of this study also showed that the uniquely local dishes of Pa Sao sub district are banana stem curry, chili paste with boiled mixed vegetables, green curry, spicy bamboo shoot soup, spicy young banana salad, rolled noodle in spiced brown soup, and rice noodle with Thai curry. This provided the evidence that the food found in Pa-Sao Community is the mixture of different cultures since people resided in the area have migrated from various areas. Therefore the local food found in the area is northern, central and northeastern Thai dishes. However, central Thai dishes are mostly consumed by the local people. One possible reason for this is that raw ingredients, such as bananas and fish are easily found consequently these raw ingredients are used as main ingredients in cooking.

1.3 Food cooked at Festivals in Pa Sao are traditional padthai, rolled noodle soup, stir-fried rice noodles, rice noodle with Thai curry, red curry, green curry, spiced stew with sweeten brown soup, green taro curry, cassia leaf curry, banana stem curry, clear soup, spicy soup, mung bean custard, mung bean stuffed dough pyramid, steamed sticky rice wrapped in banana leaves, and steamed flour with filling wrapped in banana leaves. It is interesting to point out that these festival dishes are local dishes and raw materials used for these dishes can be easily found in the area. These festival dishes require several steps and workforce for cooking thus they can only be found in important festivals (Wongtong & Raungrusmee, 2007).

1.4 Rare traditional dishes are spicy Thai puffball mushrooms soup, spicy sweetjuice soup, glinus herniarioides soup, stir-fried rice noodle with coconut milk, spicy young banana salad, young banana curry, and shrimp paste and chili soup. These dishes are rarely found in not only Pa-Sao area but also in other communities in Uttaradit. One important reason for this is that the main raw ingredients are difficult to find which results from urbanization of the area, less areas for natural forests and backyard vegetable garden.

1.5 Local healthy dishes providing good diet are banana stem curry, cassia leaf curry, spiced mixed-vegetable soup, eel curry, spicy stir-fired with eels, boiled Siamese neem with sweet sauce. These dishes are mainly made from herbs which are galangal, lemongrass, white turmeric, turmeric, green pepper, finger root, long pepper, Thai basil, and sweet basil. It could be said that local dishes found in Pa Sao community are food



having herbs as ingredients which indicates potential of the food in terms of values and can be easily developed to be food for health.

1.6 Memorizing, observing what people cooked at the festivals and teaching in schools in the community were used as methods of knowledge transfer in the community. It is interesting to discover that there is no written record of each dish recipe--how to make each dish. However, there are teachings in schools that were done through demonstrating. If there is no written record of the recipes, the community will likely loss the local food recipes.

1.7 Raw ingredients and frequently found and distinct vegetables can be divided into 3 categories:

A. Meat

Meat can be gained from 2 sources: natural sources and markets. Meats from natural source are snakehead fish, eel, catfish, fresh water snail, golden apple snail, fresh water fish and other wild animals. Meats from markets are chicken, pork, beef and seafood.

B. Vegetables

Vegetables can be gained from 2 sources: natural sources like backyard gardens, and markets. Examples of vegetables from natural sources and backyard gardens are banana stem, banana flower, climbing wattle or acacia, betel leaf, cassia, green taro, Ceylon spinach, ivy gourd, Melientha suavis Pierre (pak-wan pa), vegetable fern, morning glory, eggplant, Turkey berry, bamboo shoot, fresh chili, moringa, long bean, and Thai zucchini. Vegetables from markets are general economic vegetables like Chinese morning glory, white cabbage, long bean, cucumber, Chinese kale, tomato and baby corn.

C. Herbal vegetables

Herbal vegetables are galangal, lemon grass, kaffir lime leaves, finger root, turmeric, white turmeric, basil, sweet basil, long pepper, and green pepper.

This is clearly evident that these meat, vegetables and herbs are main ingredients for local dishes and they are easily found and cheap. The vegetables from natural sources are rich in nutrition. As a result, they are used as ingredients for each dish (The Institute of Thai Traditional Medicine, 1999).

2. The second objective was to develop the recipes for local studied dishes.

Twenty dishes selected by people in Pa-Sao community were then developed the recipes and able to be categorized into the following 5 types:

A. Curry: 9 recipes were banana stem curry, green curry, fish sour soup, cassia leaf curry, mixed vegetable curry, spiced mixed-vegetable soup, snakehead spicy soup, spicy bamboo shoot soup, and Thai fresh water snail curry.

B. Dip: 3 recipes were fish chili paste with boiled mixed vegetables, fermented soy bean and coconut milk dip, and grilled fish chili paste.

C. Salad: 3 recipes were spicy banana flower salad, spicy minced fish salad, and spicy blood and minced pork salad.

D. Miscellaneous dishes: 2 recipes were fish in dried red curry and spicy pork stir-fried.

E. Single dish: 3 recipes were traditional padthai, rolled noodle soup, and rice noodle with Thai curry.

From consumer acceptance test by 3 food specialists and local scholars, it shows that among curries and soup, green curry was rated the highest (at average level, 6.40). It is noticeable that green curry which was rated the highest is also a dish which is one of the most frequently indicated dish among the informants. Fish chili paste with boiled mixed vegetables and grilled fish chili paste were rated the highest among dips, at 6.40. This suggests that local people prefer to consume chili pastes which contain fish as ingredients. One possible reason



for this is that fish is easily found in the area, and there may be a great amount of fish in the area. For salads, spicy banana flower salad was rated the highest among them (at 6.33). Unsurprisingly, since banana flower are easily found in the area and the external appearance of the dish is better than other salads, such as spicy minced fish salad and spicy blood and minced pork salad. For miscellaneous dishes, spicy pork stir-fried was rated the highest among other dishes (at 6.27). The reason which spicy pork stir-fried was rated the highest might be that various kinds herbs, such as ginger root, holy basil and pepper corn, are used as ingredients in the dish and these herbs are easily found in the area. Lastly, rice noodle with Thai curry was rated the highest, at 6.20, among all single dishes. This is because rice noodle with Thai curry is one of the dishes which are cooked at Festivals, so people are familiar with the dish (Limsuwan, 2005)

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Effect of Surface Roughness on the Adhesion of Escherichia Coli in Stainless Steel Surface

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ABSTRACT

Bacterial adhesion and biofilm formation in metal containers are the major concerns in food and pharmaceutical industries. The surface roughness of containers is a factor plausibly affecting the amount of bacterial attachment. However, the relationship between the surface roughness and bacterial adhesion has not clearly been understood yet. Thus, this study aimed to examine the role of surface roughness on the bacterial adhesion in the food grade AISI 316L stainless steel surface. *Escherichia coli* was selected to be the bacteria tested in this study as it is a sanitization indicator in the food and pharmaceutical manufacturing. The average surface roughness ranging from 0.054 to 0.386 μm were prepared on the flat steel surface by mechanical polishing process with the different grit numbers of sandpapers. All samples were incubated for two hours with *E. coli*, and the results demonstrated that the adhesion of *E. coli* was found to increase with the increased surface roughness. The average number of *E. coli* was 3.17×10^2 cfu/cm² when the surface roughness of stainless steel was 0.054 μm . The implication of this finding could enable an essential guideline for the selection and control of surface roughness of the metal with the minimum adhesion of *E. coli* or other similar bacteria.

Keywords: *Escherichia coli*, Stainless steel, Surface roughness

INTRODUCTION

Bacterial adhesion in metal containers is a major concern in food and pharmaceutical industries. The bacteria can lead to a biofilm formation if the cleaning process is unable to completely remove the microbial cells from the container's surface. The adhesion of bacterial cells is dependent on various factors, such as environment, micro-organism, microbial species, and surface characteristics (Bohinc, Drazic, Abram, Jevsnik, Jersek, Nipic, Kurincic, & Raspor, 2016). Especially, the average surface roughness (R_a) of parts contacting the bacteria has widely been discussed as a factor that influences the bacterial attachment. Although a relationship between the surface roughness and bacterial attachment was realized by Medilanski, Kaufmann, Wick, Wanner, and Harms (2002), Hocevar, Jenko, Godec, and Drobne (2014) found that the attachment rate of *E. coli* on 316L stainless steel surface increases with the increased surface roughness since the rough and/or irregular surface can promote the adhesion strength of bacteria. Similarly, Arnold, Boothe, Suzuki, and Bailey (2004) noted that the amount of bacteria found in a 304 stainless steel surface decreases when the metal surface becomes smoother after the electropolishing process. On the contrary, (Ortega, Hagiwara, Watanabe, and Sakiyama (2010) showed that the adhesion of *E. coli* is independent on the surface roughness of 304 stainless steel when its R_a values are 0.04, 0.14 and



1.37 μm . According to mentioned previous studies, the relationship between the roughness of stainless steel surface and bacterial adhesion has not clearly been drawn yet, although some investigations presented the possible effect of workpiece roughness on the amount of bacteria depositing on the surface. To reveal a clearer understanding of such relationship, this study examines the influence of surface roughness on the bacterial adhesion in a food grade AISI 316L stainless steel. *Escherichia coli* was selected as the microbial species to be tested in this study since it is a sanitization indicator (Ortega et al., 2010) and it can also cause food poisoning (Bell, Goldoft, Griffin, Davis, Gordon, Tarr, Bartleson, Lewis, Barrett, & Wells (1994). The implication of this work could provide an essential guideline for the surface preparation of metal container in order to minimize the bacterial adhesion as well as the effort in the cleaning of contaminated surface.

METHOD

Stainless Steel Surfaces Preparation

Stainless steel grade AISI 316L, which as-received average roughness was $0.122+0.005 \mu\text{m}$, was used as a work sample in this study. Four different grit numbers of sandpaper (i.e. 80, 280, 600 and 2000) were applied to wet polish the metal surface. A profilometer was employed to measure the average roughness (R_a), maximum peak-to-valley height (R_y), and average maximum peak-to-valley height (R_z) of workpiece surface (Ortega, Hagiwara, Watanabe, and Sakiyama (2008). Each roughness parameter was measured five times, and its average was taken as a final reading. The steel coupons were washed and cleaned prior to the bacterial adhesion testing. The coupons were soaked in a commercial detergent solution for 24 hours, rinsed with 70% ethanol, washed with distilled water, autoclaved for 15 minutes at 121°C , and then dried in a hot air oven at 60°C for 30 minutes.

Bacterial Preparation

The bacterial strain *Escherichia coli* NCTC 12923 was maintained in a glycerol stock at -20°C . The bacteria were inoculated in Tryptic soy broth (TSB) (Merck KGaA, Darmstadt, Germany) and grown at 33°C for 24-48 hours. Thereafter, a new sterile TSB was prepared for making the ten-fold serial dilution. The diluted cell suspensions were subjected to the spread plate onto Plate count agar (PCA) (Merck KGaA, Darmstadt, Germany) and then incubated at 33°C for 24-48 hours. The number of colonies on the plate was counted with the countable range of 10-300 colonies.

Adhesion Experiment

The microbial suspension of 1.0 ml was evenly applied on the stainless steel coupons. The coupons were kept at 23°C for 2 hours before rinsing for three times by sterile peptone water. The final peptone rinse of 0.1 ml. was taken by a pipette and dropped into the surface of PCA before spreading it over the surface by using a sterile glass spreader. The PCA plate was incubated at 33°C for 24-48 hours. The number of colonies appearing in the PCA plate was counted and converted into the Colony Forming Unit (cfu). This response was used for indicating the adhesion of *E. coli* on the stainless steel surface.

RESULTS

Effect of the Grit Number of Sandpaper on the Surface Roughness of Stainless Steel

The surface roughness of stainless steel prepared by using the different grit numbers of sandpaper is listed in Table 1. The results showed that the use of a higher grit number or finer abrasive particles in the sandpaper produced a smoother workpiece surface. The highest surface roughness was resulted by the grit number of 80 and the value of R_a , R_y and R_z was $0.386+0.017 \mu\text{m}$, $4.012+0.727 \mu\text{m}$ and $2.953+0.366$



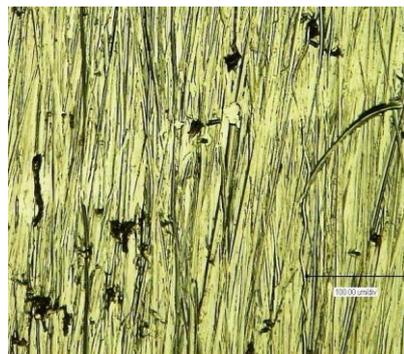
μm , respectively. The lowest surface roughness was obtained by using the grit number of 2000 and the roughness values were $0.054+0.008 \mu\text{m}$, $0.791+0.309 \mu\text{m}$ and $0.491+0.093 \mu\text{m}$ for R_a , R_y and R_z , respectively. The surface morphology of the stainless steel samples was observed by a digital microscope (VH-Z500R, Keyence, Japan) as shown in Figure 1. It can be concluded from the figure that the surface prepared by the 80-grit sandpaper (Figure 1(a)) has a lot of scratches, while the surface polished by the 2000-grit sandpaper (Figure 1(e)) has less amount of the scratches.

Table1.
Surface Roughness Values of 316L Stainless Steel Caused by the Different Grit Numbers of Sandpaper

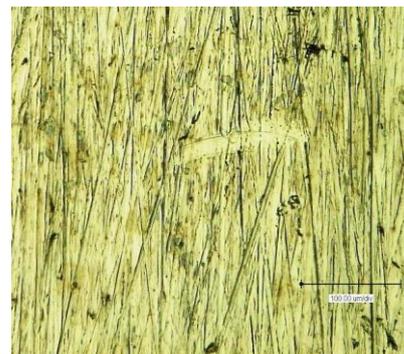
Sandpaper grit numbers	Average roughness \pm Standard deviation (μm)		
	R_a	R_y	R_z
80	0.386 ± 0.017	4.012 ± 0.727	2.953 ± 0.366
280	0.182 ± 0.020	1.906 ± 0.177	1.449 ± 0.169
600	0.083 ± 0.010	1.447 ± 0.572	0.878 ± 0.170
2000	0.054 ± 0.008	0.791 ± 0.309	0.491 ± 0.093
As-received	0.122 ± 0.005	1.451 ± 0.365	1.055 ± 0.123

Figure 1.

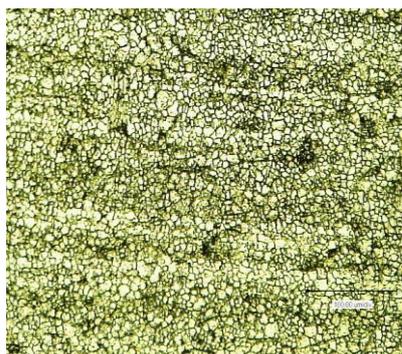
Surface morphology of stainless steel: (A) polished by the 80-grit number sandpaper; (B) polished by the 280-grit number sandpaper; (C) as-received; (D) polished by the 600-grit number sandpaper; (E) polished by the 2000-grit number sandpaper



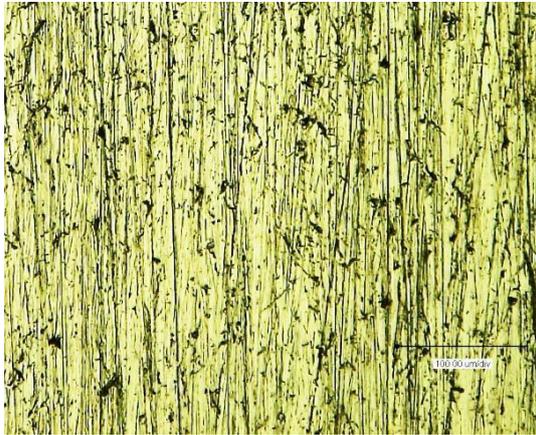
(A)



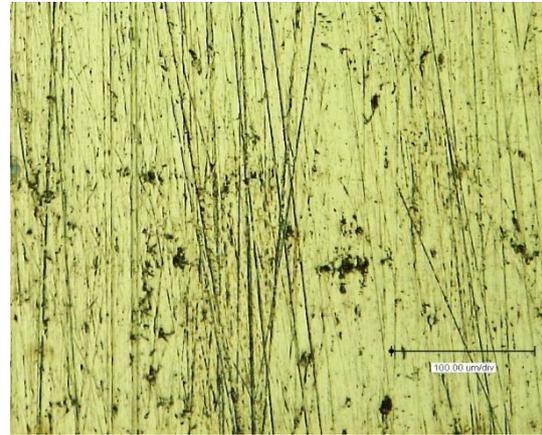
(B)



(C)



(D)



(E)

Effect of Surface Roughness on Escherichia coli Adhesion

Figure 2 presents the relationship between the average surface roughness (R_a) and the number of *E.coli* remaining in the final rinsing solution. The smoother the surface, the lesser the number of bacteria was found in the sample. The stainless steel surface polished by the 2000-grit sandpaper had the number of *E.coli* cells of 3.17×10^2 cfu/cm², which was the lowest amount of bacteria found among the tested samples. The examples of bacterial colonies taken from the different surface conditions are shown in Figure 3, demonstrating that the number of colonies decreases with the roughness of work surface. Similarly, the effect of R_y and R_z on the number of *E. coli* adhering to the stainless steel was found to correspond to the R_a results. By comparing the as-received and 2000-grit polished samples, the amount of bacteria left over on the polished sample was lower than the as-received one by 56%.

Figure 2.

The Amount of *E. coli* in the Final Rinsing Solution under the Different R_a , R_y and R_z Values

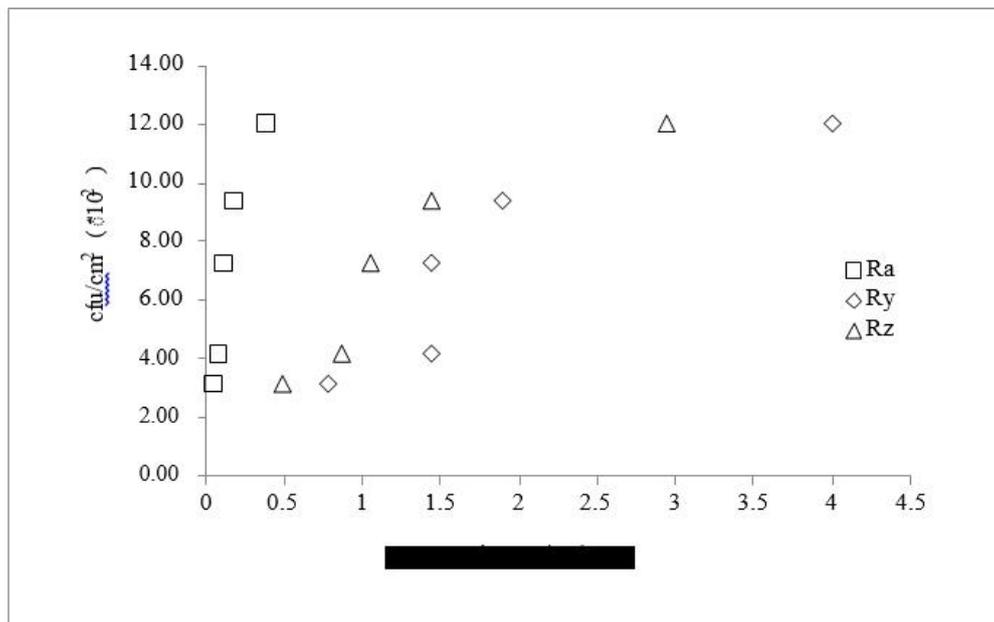
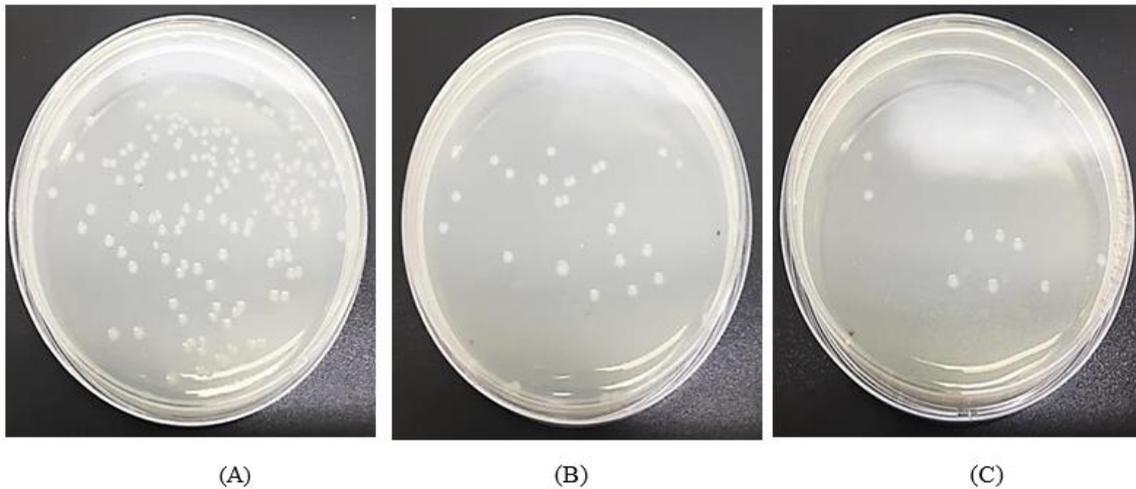




Figure 3.

Bacterial Colonies obtained from the Different surface Conditions: (A) Polished by the 80-grit Number Sandpaper; (B) as-received; (C) Polished by the 2000-grit Number Sandpaper



As per Figure 2, the amount of bacteria is sharply increased with the increased R_a , while the increase in R_y and R_z gradually increases the amount of bacteria at a lower rate than the R_a . This interestingly indicates that the bacterial adhesion is greatly dependent on the R_a , so that the control of workpiece surface has to be much relied on the R_a in order to limit the number of bacteria depositing on the surface. According to the results, the rough sample exhibited the high level for all roughness parameters. Since the R_y and R_z indicate the maximum height of surface roughness, it can be anticipated that the significantly deep scratches or trenches are occurred all over the work surface (Figure 1). Such deep scratches can allow a number of bacteria to be entrapped inside, where the typical rinsing with a low cleaning shear force cannot completely wash the microorganisms away from the sample. This thereby introduces the strong adhesion of bacteria on the workpiece surface. This finding also corresponds to the work of Hocevar et al. (2014), noting that the attachment rate of *E.coli* on the 316L stainless steel increases with the increased surface roughness. The bacteria tend to prefer the high surface irregularities as it can provide their shelter and also resist the removal of bacteria from the surface (Hilbert, Bagge-Ravn, Kold, and Gram, 2003). Therefore, the preparation of low surface roughness can improve the hygienic characteristic of the metal containers.

CONCLUSION

In this paper, the *Escherichia coli* adhesion on the AISI316L stainless steel surface has experimentally been investigated. The effect of sandpaper polishing on the roughness of metal surface was examined and the results revealed that the use of high grit number of sandpaper increased the surface roughness of the metal. The bacterial adhesion experiment showed that the amount of bacteria was highly dependent on the surface roughness of work sample. The average number of *E. coli* cells on the stainless steel polished by the 2000-grit sandpaper was the lowest (3.17×10^2 cfu/cm²) among the others. This amount was equivalent to the 56% reduction from the number of bacteria found in the unpolished sample. The findings of this experiment can verify the previously reported studies on the relationship between the surface roughness and bacterial adhesion. This work could further find its benefit for the surface preparation of metal containers used in the food and pharmaceutical industries.



ACKNOWLEDGMENT

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Plantlet Production from Shoot Tip Explants of Aquatic Plant, *Cryptocoryne walkерlii* Cultured *In Vitro*

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ABSTRACT

Cryptocoryne walkерlii is a commercially important ornamental aquatic plant species. Propagation by conventional means has been met with many difficulties. The application of modern biotechnology for conservation of this species requires an efficient *in vitro* regeneration protocol. An efficient micropropagation protocol via shoot regeneration and response of plantlet growth to basal media was established for *C. walkерlii* using shoot tip explants, highly valued as aquarium plants. Among the three basal media evaluated for shoot regeneration, MS medium was found to be the best followed by ½ MS and VW medium. MS medium was also found good for shoot regeneration and response of plantlet growth. The frequency of shoot regeneration significantly relied on kinds of basal media used. MS medium was significantly different compared to other treatments, with the highest shoot formation (50.00%), number of 2.60±0.22 shoots per explant. In this medium, the regenerated shoots developed an average of 5.60±0.45 leaves per shoot, an average leaf length of 18.92±0.52 mm, an average leaf width of 3.86±0.22 mm, root formation at 60.00%, number of 6.80±0.21 roots per explant, and root length at 20.46±0.05 mm after 60 days of culture. Multiple shoots were induced from cultured shoot tips on a modified MS medium supplemented with kinetin and TDZ. The maximum green shoot numbers were best obtained on MS medium containing 3.0 mg/l kinetin with the highest frequency of shoot induction (100.00%), number of 7.30±0.67 shoots per explant. In this medium, the regenerated shoots developed an average of 16.40±0.22 leaves per shoot, an average leaf length of 22.74±0.58 mm, an average leaf width of 5.13±0.55 mm, root formation at 100.00%, number of 13.00±0.24 roots per explant and root length at 32.27±0.12 mm after 60 day of culture. Plantlets with well-developed shoots and roots were subsequently hardened, acclimatized and successfully established in field with 100% survival rate after 30 day of acclimatization. This protocol will enable mass propagation and *ex situ* conservation of this aquatic Plant, *C. walkерlii*. The current protocol is the first report for successful establishment of *in vitro* clonal propagation of *C. walkерlii*.

Keywords: Aquatic plant, *Cryptocoryne walkерlii*, Micropropagation



INTRODUCTION

The *Cryptocoryne* (water trumpet) is an important genus of the family Araceae, comprising of 50-60 species of aquatic monocot plants. Most of the *Cryptocoryne* species are native to Southeast Asia and grow in either submerged or emerged state (Windelov, 1987) and they are popular aquarium plants (Rataj & Horeman, 1977). Natural propagation of aquatic species is limited due to the production of small number of plants with a long cultivation period, disease and requirement of large space for propagation (Sulaiman, 2004). Shoot tip explants with fully exposed and broad pre-existing meristems have high regeneration potential to rapidly form multiple shoots in a reduced number of steps and the protocol is genotype independent. Moreover, plant regeneration is direct, i.e. without a callus phase from the culture of apical meristems, and thus plants produced less somaclonal variation (Saini & Jaiwal, 2005). *In vitro* propagation, the most efficient and cost effective method for propagating large number of clonal offsprings, is the most appropriate technology for mass production to make the industry sustainable. The objective of the present study is to establish an efficient micropropagation protocol for the production of *C. walkerlii*.

MATERIALS AND METHODS

Source of explants and surface sterilization

Young plantlets of *C. walkerlii* were obtained from the Aquatic Plant Center Co., Ltd., Thailand. Shoot tips were excised from the mother plants and were washed thoroughly under running tap water. The shoot tips were surface sterilized using 8% Clorox® (5.25% sodium hypochlorite, NaOCl) for 15 minutes followed by rinsing three times with sterile distilled water. They were again surface sterilized for another 4% Clorox® (5.25% sodium hypochlorite, NaOCl) and 2-3 drops of Tween 20 per 100 ml solution for 5 minutes. The treated plantlets were washed three times with sterile distilled water to remove traces of disinfectant. The surface-sterilized shoot tips of *C. walkerlii* (1.0 cm in size) were placed on glass-bottles each containing 25 ml of medium.

Medium and culture conditions

Basal MS medium without any PGRs was used as control. All culture media were supplemented with 3% sucrose and gelled with 0.76% agar and adjusted to a pH of 5.7 with 1 N KOH or 1 N HCl prior to autoclaving at 1.05 kg/cm², 121°C for 15 minutes. All cultures were maintained at 25±2°C air temperatures under a 16 h photoperiod with light supplied by cool-white fluorescent lamps at an intensity of 10 μmol m⁻² s⁻¹ photosynthetic photon flux density (PPFD).

Influence of different basal media on in vitro shoot regeneration of C. walkerlii after 60 day culture

The surface-sterilized shoot tips of *C. walkerlii* (1.0 cm in size) were placed on bottles containing medium. Each basal media had ten culture bottles which were replicated twice. The basal media were VW basal medium (Vacin & Went, 1949), MS medium (Murashige & Skoog, 1962) and ½ MS medium. The frequency of shoot induction (%), number of shoots per explant, number of leaves, leaf length (mm), leaf width (mm), the percentage of rooting, number of roots per explant and root length (mm) were scored and compared statistically after 60 day of culture.

Effects of variable levels of cytokinins on in vitro shoot regeneration in C. walkerlii on MS medium from shoot tip explants after 60 day of culture



The shoot tips of *C. walkerii* (1.0 cm in size) were sectioned from the 60-day-old plantlets (approximately 3.5 cm height) and cultured on MS medium (Murashige and Skoog, 1962) supplemented with 0, 1.0, 3.0 and 5.0 mg/l kinetin or TDZ. The frequency of shoot induction (%), number of shoots per explant, number of leaves, leaf length (mm), leaf width (mm), the percentage of rooting, number of roots per explant and root length (mm) were scored and compared statistically after 60 day of culture.

Greenhouse Acclimatization

In vitro rooted plantlets of *C. walkerii* were taken out from culture bottles and carefully rinsed thoroughly with tap water to remove all traces of agar. The plantlets were then transplanted into plastic pots containing a mixture of organic soil and sand (1:1) overlaid with tap water under greenhouse conditions. The percentage of plantlet survival was recorded 30 day after acclimatization. Well-developed plants with healthy shoots were successfully transferred to field conditions.

Experimental design and statistical analysis

Experiments were performed in a completely randomized design (CRD). The data were analyzed by ANOVA using SPSS (version-20) and the mean values were compared using Duncan’s multiple range test at a 5% probability level.

RESULTS

Influence of different basal media on in vitro shoot regeneration of C. walkerii after 60 day culture

After 60 day of culture, shoot tip explants cultured on various basal media developed multiple shoots (Table 1). MS medium resulted in different morphogenetic responses in terms of the frequency of shoot induction (%), number of shoots per explant, number of leaves, leaf length (mm), leaf width (mm), percentage of rooting, number of roots per explant and root length (mm) (Figure 1A-D). After 60 day culture, there was no callus formation in all shoot tip explants cultured on all media (Table 1). MS medium was also found good for shoot regeneration and response of plantlet growth. The frequency of shoot induction significantly relied on kinds of basal media used. MS medium was significantly different compared to other treatments, with the highest shoot formation (50.00 %), number of 2.60±0.22 shoots per explant. In this medium, the regenerated shoots developed an average of 5.60±0.45 leaves per shoot, an average leaf length of 18.92±0.52 mm, and an average leaf width of 3.86±0.22 mm after 60 day of culture period (Table 1). They produced significant difference in the number of roots produced significant difference in the number of roots produced and the root length. *C. walkerii* plantlets produced longer and more roots when cultured on MS medium. MS medium showed the highest root formation at 60.00%, number of 6.80±0.21 roots per explant and root length at 20.46±0.05 mm after 60 days of culture (Table 2). In contrast, VW medium produced the lowest shoot proliferation, plantlet growth and root formation (Tables 1, 2). So, for shoot induction of *C. walkerii* MS medium was found to be the most suitable medium for this species followed by ½ MS. The leaves of the adventitious shoots were healthy with green color and did not show any sign of vitrification (Figure 1).



Table 1. Influence of Different Basal Media on In Vitro Shoot Regeneration of *Cryptocoryne Walkerlii* after 60 Day Culture.

Basal media	The frequency of shoot induction (%)	No. shoots per explant (mean±SE)	No. leaves (mean±SE)	Leaf length (mm) (mean±SE)	Leaf width (mm) (mean±SE)
VW	10.00 ^c	1.10±0.69 ^c	5.20±2.55 ^a	11.14±0.83 ^c	3.72±0.19 ^a
MS	50.00 ^a	2.60±0.22 ^a	5.60±0.45 ^a	18.92±0.52 ^a	3.86±0.22 ^a
½ MS	30.00 ^b	1.48±0.62 ^b	5.40±3.47 ^a	14.56±0.53 ^b	3.75±0.15 ^a

Data shown is the mean of three replicates ± standard error (SE). In each column, mean values followed by the same letter is not significantly different at 0.05 levels (DMRT).

Table 2. Mean Response of Plantlet Growth to Basal Media of *Cryptocoryne walkerlii* after 60 Day Culture Period.

Basal media	Rooting (%)	No. roots per explant (mean±SE)	Root length (mm) (mean±SE)
VW	20.00 ^b	2.70±3.06 ^b	6.69±1.24 ^b
MS	60.00 ^a	6.80±0.21 ^a	20.46±0.05 ^a
½ MS	60.00 ^a	6.10±1.66 ^a	9.76±1.06 ^b

Data shown is the mean of three replicates ± standard error (SE). In each column, mean values followed by the same letter is not significantly different at 0.05 levels (DMRT).

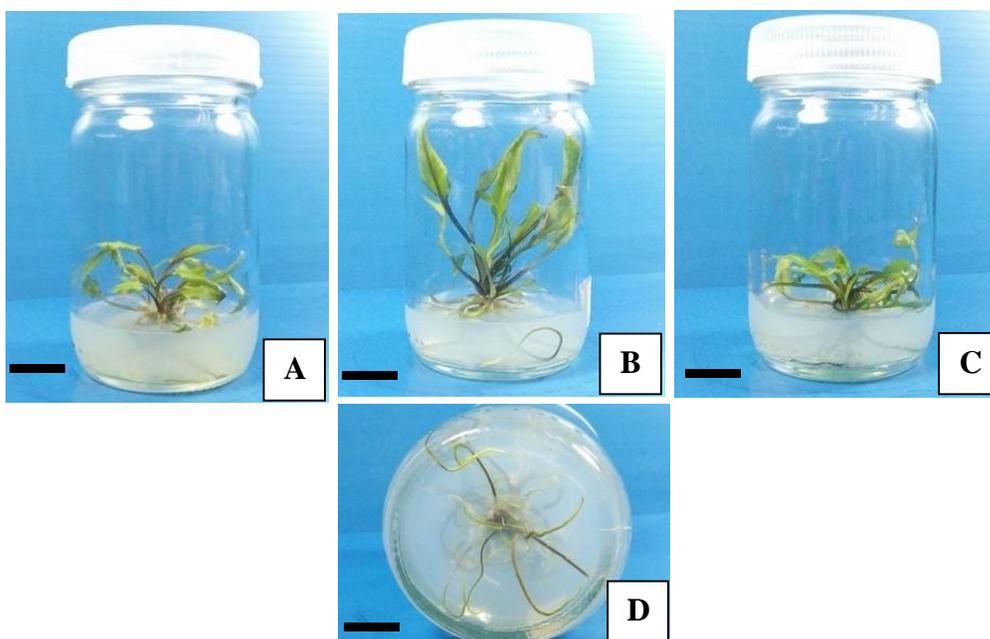




Figure 1. Influence of Different Basal Media on *in vitro* Shoot Regeneration of *Cryptocoryne walkerlii* after 60 Day Culture. (A); VW medium, (B); MS medium, (C); ½ MS medium and (D); rooting of *C. walkerlii* on MS medium after 60 day culture period (Scale bar=1 cm).

Effects of variable levels of cytokinins on *in vitro* shoot regeneration in *C. walkerlii* on MS medium from shoot tip explants after 60 day of culture

After 60 day of culture on MS medium supplemented with 0, 1.0, 3.0 and 5.0 mg/l kinetin or TDZ, each shoot tips of *C. walkerlii* developed shootlets. Table 3 shows the results of *in vitro* shoot regeneration in *C. walkerlii*. Supplementation of the MS media with both kinetin and TDZ was essential for the shoot induction. Kinetin showed significantly (DMRT; $P \leq 0.05$) better performance than TDZ in every parameter of shoot tips induction to shoot initiation and their proliferation. The frequency of shoot tips developing shoots was 100 % and multiple shoots were formed at a high frequency of 7.30 ± 0.67 ($P \leq 0.05$) on MS medium supplemented with 3.0 mg/l kinetin. The leaves of the adventitious shoots were healthy with green colour and showed no sign of vitrification. In this medium, the regenerated shoots developed an average of 16.40 ± 0.22 leaves per shoot, an average leaf length of 22.74 ± 0.58 mm and an average leaf width of 5.13 ± 0.55 mm (Table 3).

TDZ was effective for shoot induction from shoot tips explants of *C. walkerlii*. A relatively low level of TDZ (1.0 mg/l) induced 3.50 ± 0.83 regenerated shoots per explant. Increasing the concentration of TDZ above 1.0 mg/l decreased the number of shoots per explant, number of leaves, leaf length and leaf width. PGR-free MS medium was able to convert shoot tips into shoots but in a very low frequency with 2.60 ± 0.22 shoots only.

Root formation occurred on plant growth regulator-free MS medium or with 1.0, 3.0 and 5.0 mg/l kinetin after 60 day of culture (Table 4). However, MS medium containing kinetin was more effective in terms of initiation of roots per shoot. In the absence of kinetin, fewer roots were induced, and those that were produced were much shorter compared to those induced using kinetin treatments (Table 4). MS medium supplemented with 3.0 mg/l kinetin gave the highest root formation at 100.00 %, number of 13.00 ± 0.24 roots per explant and root length at 32.27 ± 0.12 mm after 60 day of culture period (Table 4). Each shoot with a well-developed rhizosphere, was advanced for acclimatization (Figure 2). The plants propagated from shoot tips did not show any morphological abnormality when compared with the original plants. Regenerated shoots obtained from MS medium supplemented with TDZ did not produce any roots (Figure 2C, 2F).

Table 3. Effects of Variable Levels of Cytokinins on *In Vitro* Shoot Regeneration in *C. Walkerlii* on MS Medium from Shoot Tip Explants after 60 Day of Growth.

MS plus PGRs (mg/l)		The frequency of shoot induction (%)	No. shoots per explant (mean±SE)	No. leaves (mean±SE)	Leaf length (mm) (mean±SE)	Leaf width (mm) (mean±SE)
kinetin	TDZ					
0	0	50.00 ^c	2.60 ± 0.22^c	5.60 ± 0.45^c	18.92 ± 0.52^{bc}	3.86 ± 0.22^b
1.0	0	70.00 ^b	3.70 ± 0.49^b	14.90 ± 0.19^{ab}	20.25 ± 0.50^{ab}	4.36 ± 0.14^a
3.0	0	100.00 ^a	7.30 ± 0.67^a	16.40 ± 0.22^a	22.74 ± 0.58^a	5.13 ± 0.55^a
5.0	0	100.00 ^a	6.10 ± 0.48^a	15.30 ± 0.14^{ab}	20.82 ± 0.50^{ab}	4.57 ± 0.35^a
0	1.0	100.00 ^a	3.50 ± 0.83^b	10.70 ± 0.29^{bc}	18.52 ± 0.11^{bc}	3.88 ± 0.25^b
0	3.0	100.00 ^a	3.20 ± 0.33^b	7.30 ± 0.10^c	16.97 ± 0.91^d	3.84 ± 0.77^b
0	5.0	70.00 ^b	2.70 ± 0.33^c	5.90 ± 0.48^c	14.61 ± 0.64^e	3.76 ± 0.18^b



Data shown is the mean of three replicates ± standard error (SE). In each column, mean values followed by the same letter is not significantly different at 0.05 levels (DMRT).

Table 4. Mean Response of Plantlet Growth to Cytokinins of *Cryptocoryne Walkerii* after 60 Day Culture Period.

MS plus PGRs (mg/l)		Rooting (%)	Number of roots per explant (mean±SE)	Root length (mm) (mean±SE)
kinetin	TDZ			
0	0	60.00 ^b	6.0±0.19 ^b	20.79±0.11 ^b
1.0	0	90.00 ^a	9.0±0.11 ^b	18.28±0.21 ^b
3.0	0	100.00 ^a	13.00±0.24 ^a	32.27±0.12 ^a
5.0	0	100.00 ^a	12.20±0.10 ^a	35.61±0.17 ^a
0	1.0	0.00 ^c	0.0±0.00 ^c	0.0±0.00 ^c
0	3.0	0.00 ^c	0.0±0.00 ^c	0.0±0.00 ^c
0	5.0	0.00 ^c	0.0±0.00 ^c	0.0±0.00 ^c

Data shown is the mean of three replicates ± standard error (SE). In each column, mean values followed by the same letter is not significantly different at 0.05 levels (DMRT).

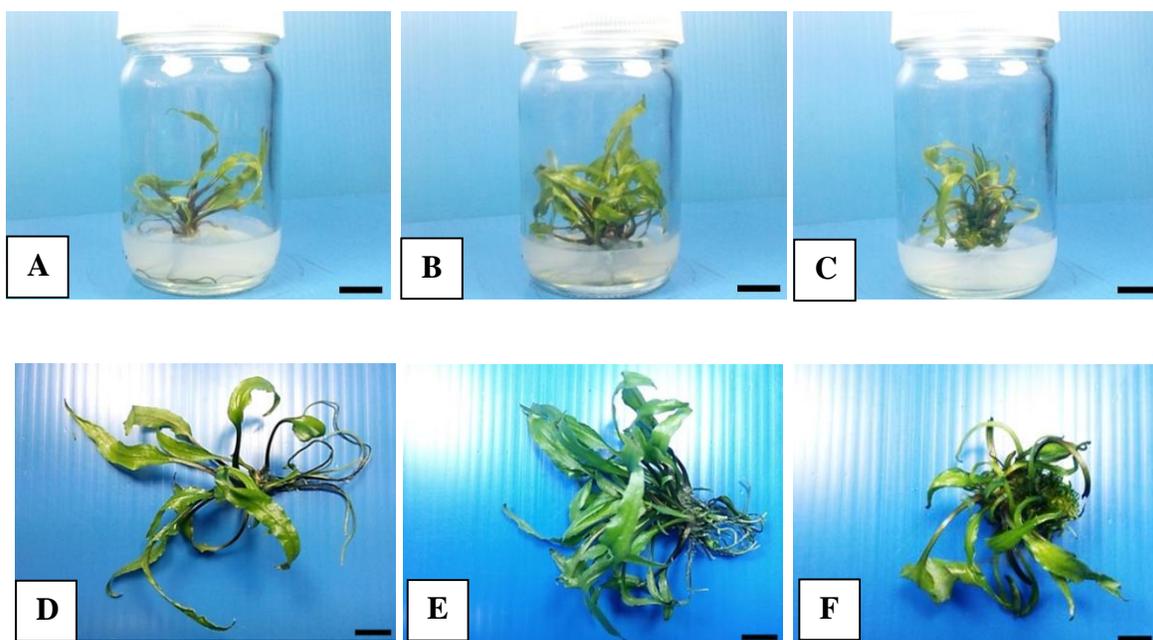


Figure 2. Regeneration of multiple shoots of *Cryptocoryne walkerii* after 60 day culture. (A, D); Shoots and root formation occurred on plant growth regulator-free MS medium, (B, E); Multiplication of shoots regenerated from shoot tips on MS medium supplemented with 3.0 mg/l kinetin, (C, F); Multiplication of shoots regenerated from shoot tips on MS medium supplemented with 1.0 mg/l TDZ (Scale bar=1 cm).



Greenhouse Acclimatization

After successful production of sufficient roots, *in vitro* rooted plantlets of *C. walkerlii* were taken out from culture bottles and carefully rinsed thoroughly with tap water to remove all traces of agar. The plantlets were then transplanted into plastic pots containing a mixture of organic soil and sand (1:1) overlaid with tap water under greenhouse conditions. One hundred percentage of plantlet survived after 30 day of acclimatization. The survival rate of *C. walkerlii* was 100%, and reached a height of range of 25-30 cm. Well-developed plants with healthy shoots were successfully transferred to field conditions (Figure 3).

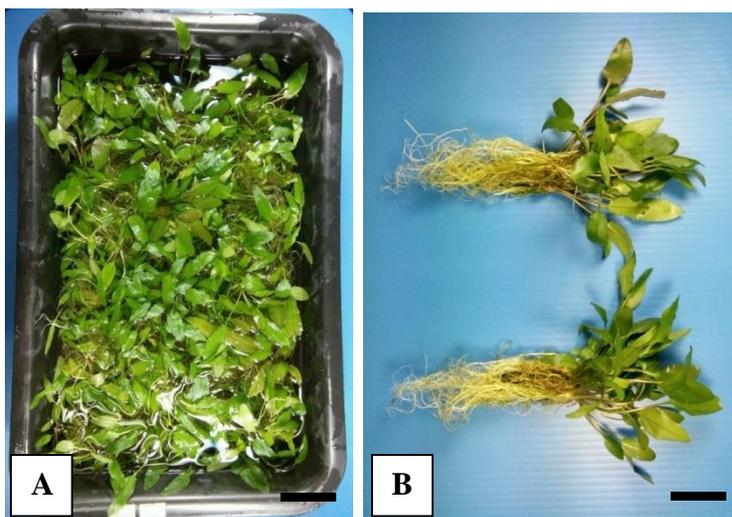


Figure 3. Plantlets of *Cryptocoryne Walkerlii*. (A-B); Survival of plantlets after 30 day of acclimatization of partially acclimatized plantlets on a mixture of organic soil and sand (1:1) overlaid with tap water under greenhouse conditions (Scale bar=1 cm).

DISCUSSION

The results of this study indicated that basal media are essential for the micropropagation of *C. walkerlii*. This species had the highest shoot proliferation and plantlet growth on the MS medium. Out of the four basal media which have been tried with different nutritional composition, MS medium positively influenced shoot regeneration and subsequent plantlet development (Tables 1, 2), but when cultured on ½ MS and VW media the responses were very poor. This difference in the shoot proliferation and plantlet growth is probably due to the supplementation of VW medium with 20 % coconut water, vitamins of Murashige and Skoog (1962) and plant growth regulators or differences in plant genotype. This varied response in shoot proliferation and plantlet growth in different media might be due to the media compositions as both the media contains very low amount of macro and micro elements and vitamins compared to MS and ½ MS medium.

Shoot tips of *C. walkerlii*. have a high regeneration potential; hence, they are commonly used as explants for vegetative propagation. The multiple shoots occurred directly via organogenesis and without forming callus on MS medium supplemented with kinetin and TDZ. The main advantages of direct shoot formation without an intervening callus phase is that it saves time to regenerate uniform (genetically uniform) plantlets. This opens another option for rapid and efficient mass propagation for *C. walkerlii*. In this study, initially different cytokinin types and levels were employed to stimulate accelerated induction of shoots. PGRs play an important



role during *in vitro* regeneration via shoot tips (Getu & Feyissa, 2013; Rawat, Rawat, Chandra, & Nautiyal, 2013). Cytokinins involved in cell division, growth and organogenesis (Berleth & Sachs, 2001; Tanaka, Sano, Tamaoki, Nakajima, Kondo, & Hasezawa, 2006). The results were in agreement with results from other *Cryptocoryne* spp (Stanly, Bhatt, & Keng, 2011). Kinetin and TDZ showed individual effects and the results indicated that differences in the regeneration response were found on organ formation. The induction of roots is an important procedure to form the complete plantlets. Root formation occurred on plant growth regulator-free MS medium or with 1.0, 3.0 and 5.0 mg/l kinetin after 60 day of culture and successfully acclimatized to greenhouse conditions and also demonstrated that kinetin has a powerful ability to stimulate root formation. These reasons may have resulted in a higher survival.

After 30 day of acclimatization, the survival rate of *C. walkerlii* was 100%, and reached a height of range of 25-30 cm. Acclimatized plantlets of *C. walkerlii* did not show any morphological abnormality when compared to their donor mother plants. Successful acclimatization and field transfer of the *in vitro* regenerated plantlets have also been reported in *Nymphoides indica* (Jenks, Kane, & McConnell, 2000); *Cryptocoryne wendtii* and *Echinodorus cordifolius* (Dissanayake, Hettiarachchi, & Iqbal, 2007); *Cryptocoryne wendtii* and *Cryptocoryne beckettii* (Stanly, Bhatt, & Keng, 2011) and *Cryptocoryne beckettii* and *Cryptocoryne bognerii* (Herath, Krishnarajah, & Wijesundara, 2008). The protocol described here is efficient, reproducible and provide a rapid technique for mass propagation and multiplication of this potential plant.

CONCLUSIONS

In conclusion, a system to regenerate *C. walkerlii* through multiple shoots from shoot tip was established for the first time. Shoot tip appeared to be a potentially suitable explant for micropropagation; thus, made it well-suited for large-scale commercial propagation. *In vitro*-derived plants did not display any phenotypic variation during subsequent vegetative development. One hundred percentages of the acclimatized plantlets grew vigorously without any morphological abnormalities.

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Large Scale *In Vitro* Propagation of *Anthurium Andraeanum* cv. HC 028 for Commercial Application

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ABSTRACT

Anthurium is a popular genus of the Araceae (order Spathiflorae) as cut-flowers and potted plants due to its attractive long-lasting inflorescences and long vase-life. The sale volume of *Anthurium* is ranked the second in the world, following orchids. An efficient and simple procedure was systematically developed for inducing protocorm-like bodies (PLBs), multiple shoots and plantlet regeneration from shoot tip explants of *Anthurium andraeanum* cv. HC 028. Shoot tip explants were excised and cultured on MS (Murashige & Skoog, 1962) medium fortified with different concentrations of N⁶-benzylaminopurine (BAP; 0, 1.0, 2.0, 3.0, 4.0 or 5.0 mg/l) and 6-furfurylaminopurine (KIN; 0, 1.0, 2.0, 3.0, 4.0 or 5.0 mg/l), the highest frequency (100%) of PLB induction. Mature PLBs showed significant shoot proliferation with maximum number of 12.90±0.12 shoots per explant and shoot length at 28.14±1.41 mm was achieved on MS medium supplemented with 4.0 mg/l BAP after being culture for 60 days. Full strength MS medium containing different concentrations of auxin (Indole-3-butyric acid; IBA; 0, 1.0, 2.0, or 3.0 mg/l) was used for *in vitro* rooting of shoots. The most effective medium for root induction at a high frequency of 6.08±0.18 roots per regenerated shoot consisted of 2.0 mg/l IBA within 30 days after culture. Rooted plantlets were successfully transferred into plastic cups containing a mixture of charcoal and coconut fiber (1:1), acclimatized in the greenhouse, and subsequently established in the field. A 95% survival rate was observed and developed with normal phenotypes. The micropropagation protocols described provide rapid and cost-effective methods for *in vitro* propagation for commercial application of *Anthurium andraeanum* cv. HC 028.

Keywords: *Anthurium*, *In Vitro* Propagation, Shoot Tip Culture

INTRODUCTION

Among the tropical cut-flowers, orchids hold the top position followed by *Anthurium* (Dufour & Guerin, 2003). *Anthurium*, a member of the Araceae family, which originated from the tropics of Central and South America (Gantait, Mandal, Bhattacharyya, & Das, 2008), stands out amongst most of the tropical cultivated flowers for its elegance, and long vase-life. It gains its fame by exhibiting its striking ensemble, which is created unitedly by its spadix (a spike of minute flowers closely arranged around a fleshy axis) and its spathe (a large sheathing bract enclosing the flower cluster) (Higaki, Ramussen, & Carpenter, 1984). A vast number of



Anthurium species and hybrids are traded internationally as cut-flowers, potted plants and landscape plants (Reid & Dodge, 2002). In order to have sustainable supply of *Anthurium* flowers, availability of planting materials plays an important role.

Anthurium is sexually propagated through seed (Dufour & Guerin, 2003); while, a number of taxa fall short to generate viable seeds owing to incompatibilities (Sheffer & Kamemoto, 1976). Furthermore, propagation via seeds produce heterogeneous progenies attributable to cross pollination (Bejoy, Sumitha, & Anish, 2008), resulting in disparity in the form of colour, quality, yield and the time to first flowering (Jahan, Islam, Khan, Mamun, Ahmed, & Hakim, 2009). In addition, the seeds have been reported to be viable only for 2-3 days after harvest with very low germination of 20-30% (Jahan *et al.*, 2009). Alternatively, asexual propagation of *Anthurium* is performed via terminal and single node cuttings. Splitting of de novo emerging suckers or offshoots along with topping can be used to stimulate shoots (Mahanta & Paswan, 2001). Despite the ability to generate clones, vegetative propagation of *Anthurium* is very time-consuming, taking years to develop into marketable amounts of elite plant materials (de Lima, Ulisses, Camara, Cavalcante, Albuquerque, & Lilia, 2006). *In vitro* regeneration via tissue culture has been confirmed to uphold accelerated multiplication of elite clones and is a must for the advancement of plants through genetic engineering. The objective of the present study was undertaken to investigate the effect of different concentrations of two cytokinins on optimal induction of multiple shoots and different concentration of an auxin on *in vitro* rooting from shoot explants of *Anthurium andraeanum* cv. HC 028.

MATERIALS AND METHODS

Source of explants and surface sterilization

Shoot tips of *Anthurium andraeanum* cv. HC 028 were excised from the mother plants, and were washed thoroughly under running tap water. The shoot tips were washed for 10 minutes in tap water and surface sterilized using 10 % Clorox® (5.25% sodium hypochlorite, NaOCl) for 5 minutes followed by rinsing three times with sterile distilled water. They were again surface sterilized for another 5% Clorox® (5.25% sodium hypochlorite, NaOCl) and 2-3 drops of Tween 20 per 100 ml solution for 10 minutes. The treated plantlets were washed three times with sterile distilled water to remove traces of disinfectant. The surface-sterilized shoot tips (1.0 cm) were inoculated into bottles containing MS (Murashige & Skoog, 1962) medium for 1 week.

Medium and culture conditions

All media used for the present study were based on MS (Murashige & Skoog, 1962) medium supplemented with 3% (w/v) sucrose and 0.76% (w/v) agar. Basal MS medium without any PGRs was used as control. The pH of the media was adjusted to 5.7 with 1 N KOH or 1 N HCl prior to autoclaving at 1.05 kg/cm², 121°C for 15 minutes. All cultures were maintained at 25±2°C air temperatures under a 16 h photoperiod with light supplied by cool-white fluorescent lamps at an intensity of 10 µmol m⁻² s⁻¹ photosynthetic photon flux density (PPFD). Plant materials were stored in glass-capped culture jars (115 ml capacity) each containing 25 ml of medium.

Effects of different concentrations of two cytokinins on shoot regeneration of Anthurium andraeanum cv. HC 028 after culture for 60 days

Shoot tip explants were excised and cultured on MS (Murashige & Skoog, 1962) medium fortified with different concentrations of N⁶-benzylaminopurine (BAP; 0, 1.0, 2.0, 3.0, 4.0 or 5.0 mg/l) and 6-furfurylamino purine (KIN; 0, 1.0, 2.0, 3.0, 4.0 or 5.0 mg/l). The shoot clumps were repeatedly subcultured onto fresh shoot multiplication medium at 60 day intervals where multiple shoots showed fast growth with



more number of shoot buds. The frequency of PLB induction, the percentage of shoot induction, number of shoots per explant and shoot length (mm) were recorded and compared statistically after 60 days of culture.

Effects of IBA on in vitro rooting of Anthurium andraeanum cv. HC 028 regenerated shoots after 30 days

For root induction, elongated shoots (2.0 cm) with two or three leaves were cultured on MS medium augmented with Indole-3-butyric acid; (IBA) at 0, 1.0, 2.0, or 3.0 mg/l. The rooting percentage, number of roots per regenerated shoot and root length (cm) were recorded and compared statistically after 30 days of culture.

Greenhouse Acclimatization

After 30 days of culture, *in vitro* rooted plantlets of *Anthurium andraeanum* cv. HC 028 were taken out from culture bottles and rinsed thoroughly with tap water to remove residual nutrients and agar from the plantlets. Rooted plantlets were transferred into plastic cups containing a mixture of charcoal and coconut fiber (1:1), established in the greenhouse with 80-90% relative humidity, 12 h photoperiod, 300-400 $\mu\text{mol m}^{-2} \text{s}^{-1}$ photosynthetic photon flux density (PPFD) (shaded sunlight) and 28 \pm 1 $^{\circ}\text{C}$ to 24 \pm 1 $^{\circ}\text{C}$ day/night temperature, and subsequently acclimatized in the field. The percentage of plantlet survival was recorded 30 days of acclimatization.

Experimental design and statistical analysis

Experiments were performed in a completely randomized design (CRD). The data were analyzed by ANOVA using SPSS (version-20) and the mean values were compared using Duncan’s multiple range test at a 5% probability level.

RESULTS

Effects of different concentrations of two cytokinins on shoot regeneration of Anthurium andraeanum cv. HC 028 after culture for 60 days

Type of cytokinins and concentrations influenced direct induction and proliferation of PLBs and shoot multiplication from shoot tip explant. Supplementation of the media with BAP or KIN was essential for the development of adventitious buds and a morphogenetic response in term of PLB formation and shoot formation. Supplementing the culture medium with BAP produced light green PLBs that developed from the cut edges of the explant after 30 days of culture. BAP showed significantly (DMRT; $P \leq 0.05$) better performance than KIN in every parameter of PLB conversion to shoot initiation and their proliferation. The morphogenetic response of shoot tip explants is presented in Table 1. Shoot regeneration was observed at all concentrations of BAP and KIN, but the significantly highest frequency (100%) of PLB induction. Mature PLBs showed significant shoot proliferation with maximum number of 12.90 \pm 0.12 shoots per explant and shoot length at 28.14 \pm 1.41 mm was achieved on MS medium supplemented with 4.0 mg/l BAP after culture for 60 days (Table 1; Figure 1B-C). The number of shoots decreased with concentration of BAP above 4.0 mg/l (Table 1; Figure 1). KIN induced fewer shoots per explant compared with BAP alone. In the case of KIN, maximum percent of multiple shoot regeneration (100%) was observed on MS medium containing 3.0 mg/l KIN, which also generated the maximum number of shoots (5.20 \pm 0.53 shoots per explant) and shoot length at 12.50 \pm 0.46 mm (Table 1; Figure 1D).

Table 1. Effects of Two Cytokinin and Concentration on Shoot Regeneration from Shoot Tip Explants of *Anthurium Andraeanum* cv. HC 028 after Culture for 60 Days.



MS plus PGRs (mg/l)		Frequency of PLB induction (%)	Shoot induction (%)	No. of shoots per explant (mean±SE)	Shoot length (mm) (mean±SE)
BAP	KIN				
0	0.0	30.00 ^c	30.00 ^c	1.20±0.47 ^e	10.14±1.23 ^e
1.0	0.0	60.00 ^b	60.00 ^b	2.50±0.12 ^d	10.50±0.77 ^e
2.0	0.0	60.00 ^b	60.00 ^b	2.80±0.19 ^d	11.50±0.13 ^d
3.0	0.0	100.00 ^a	100.00 ^a	4.80±0.06 ^c	12.68±0.33 ^c
4.0	0.0	100.00 ^a	100.00 ^a	12.90±0.12 ^a	28.14±1.41 ^a
5.0	0.0	100.00 ^a	100.00 ^a	7.40±0.56 ^b	14.67±1.14 ^b
0.0	1.0	60.00 ^b	60.00 ^b	2.45±0.11 ^d	10.18±0.77 ^e
0.0	2.0	60.00 ^b	60.00 ^b	2.50±0.28 ^d	11.50±0.72 ^d
0.0	3.0	100.00 ^a	100.00 ^a	5.20±0.53 ^c	12.50±0.46 ^c
0.0	4.0	60.00 ^b	60.00 ^b	2.90±0.81 ^d	10.75±0.45 ^e
0.0	5.0	55.00 ^b	55.00 ^b	2.50±0.56 ^d	10.09±0.46 ^e

Data shown is the mean of three replicates ± standard error (SE). In each column, mean values followed by the same letter is not significantly different at 0.05 levels (DMRT).

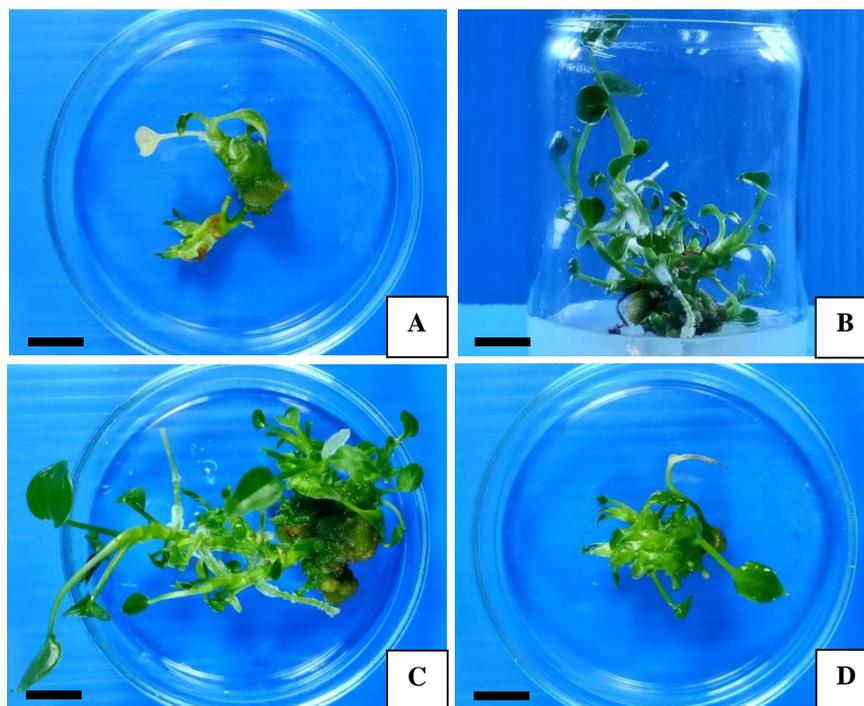


Figure 1. Effects of Two Cytokinins and Concentrations on Shoot Regeneration from Shoot Tip Explants of *Anthurium Andraeanum* cv. HC 028 after Culture for 60 Days. (A); on MS medium, (B-C); on MS medium supplemented with 4.0 mg/l BAP, (D); on MS medium supplemented with 3.0 mg/l KIN (Scale bar=1 cm).



Effects of IBA on in vitro rooting of *Anthurium andraeanum* cv. HC 028 regenerated shoots after 30 days

For rooting, elongated shoots were cultured on MS medium without plant growth regulators and MS medium augmented with different concentrations of IBA (0, 1.0, 2.0 or 3.0 mg/l). Roots were induced directly from the shoot base without an intervening callus phase on medium containing IBA. In the case of IBA concentrations, the highest rooting frequency obtained was 100% with 6.0±0.18 roots per explant and root length at 7.92±0.08 cm on MS medium supplemented with 2.0 mg/l IBA (Table 2, Figure 2). Increasing the level of IBA caused a steady decline in the rooting performance.

Table 2. Effects of IBA on *In Vitro* Rooting of *Anthurium Andraeanum* cv. HC 028 Regenerated Shoots after 30 Days.

IBA (mg/l)	Rooting percentage	Number of roots per regenerated shoot (mean±SE)	Root length (cm) (mean±SE)
0	100	3.0±0.62 ^c	2.85±0.05 ^c
1.0	100	4.2±0.04 ^b	3.85±0.13 ^b
2.0	100	6.0±0.18 ^a	7.92±0.08 ^a
3.0	100	5.8±0.02 ^a	7.52±0.14 ^a

Data shown is the mean of three replicates ± standard error (SE). In each column, mean values followed by the same letter is not significantly different at 0.05 levels (DMRT).

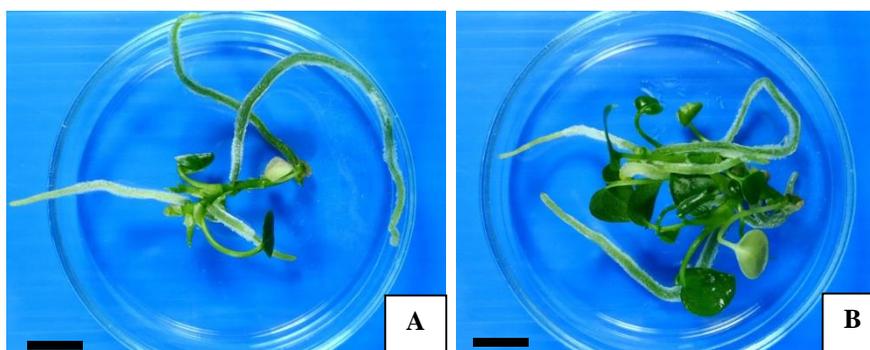


Figure 2. Effects of IBA on *In Vitro* Rooting of *Anthurium Andraeanum* cv. HC 028 Regenerated Shoots after 30 Days. (A); on MS medium, (B); on MS medium supplemented with 2.0 mg/l IBA (Scale bar=1 cm).

Greenhouse Acclimatization

Rooted plantlets measuring 3-5 cm in size with three to four leaves were successfully transferred into plastic cups containing a mixture of charcoal and coconut fiber (1:1), acclimatized in the greenhouse, and subsequently established in the field with survival rate of 95%. The acclimatized plants appeared morphologically uniform with normal leaves, shape, and growth patterns (Figure 3).



Figure 3. Plantlets of *Anthurium Andraeanum* cv. HC 028. (A); Rooted plantlets growing in the plastic cups containing a mixture of charcoal and coconut fiber (1:1), acclimatized in the greenhouse after 30 days and (B); acclimatized in the greenhouse after 90 days (Scale bar=1 cm).

DISCUSSION

Of the two cytokinins used, BAP was proved to be the most efficient cytokinin for multiple shoot regeneration compared to KIN. Supplementation of the media with BAP or KIN was essential for the development of adventitious buds and a morphogenetic response in term of PLB formation and shoot formation. Direct PLB induction has been reported by Hong, Chen, and Chang, (2010), Hossain, Sharma, Teixeira da Silva, and Pathak, (2010) and Sgarbi, Grimaudo, and Del Prete, (2009).. The main advantages of direct PLB formation without an intervening callus phase are that it saves time to regenerate uniform plantlets. This opens another option for rapid and efficient mass propagation for *Anthurium andraeanum* cv. HC 028. Shoot regeneration was observed at all concentrations of BAP and KIN used, but the significantly highest frequency (100%) of PLB induction. Mature PLBs showed significant shoot proliferation with maximum number of 12.90 ± 0.12 shoots per explant and shoot length at 28.14 ± 1.41 mm was achieved on MS medium supplemented with 4.0 mg/l BAP after culture for 60 days. The effect of BAP on multiple shoot formation has also been studied in various plant species, such as *Gymnema sylvestre* (Komalavalli & Rao, 2000), *Dendrobium densiflorum* Lindl. ex Wall. (Luo, Wang, Zha, and Huang, 2008), *Rosa canina* (Pahnekolayi, Tehranifar, Samiei, and Shoor, 2014) and *Cucumis sativus* L. cv. ‘Green long’ (Sangeetha & Venkatachalam, 2014). Therefore, cytokinin appears to be an essential requirement for shoot regeneration, and BAP was found to be most effective for induction of PLBs and multiple shoots of *Anthurium andraeanum* cv. HC 028.

In this study IBA was effective for rooting of *Anthurium andraeanum* cv. HC 028 and this agrees with the findings of Kanchanapoom, Ponpiboon, Wirakiat, and Kanchanapoom, (2011) who showed IBA was effective in rooting in *Lilium longiflorum* ‘Easter lily’. The rooted plants were successfully hardened off inside the greenhouse in sterile charcoal and coconut fiber for 30 days. Ninety five percent of the plants survived after acclimatization. There was no detectable variation among the potted plants with respect to morphological and growth characteristics. Successful acclimatization and field transfer of the *in vitro* regenerated plantlets have also been reported in *Salvadora persica* (Kumari & Singh, 2012) and *Gloriosa superba* (Yadav, Aggarwal, and Singh, 2013). The protocol described here is efficient, reproducible and provide a rapid technique for mass propagation and multiplication of this potential tropical cut-flowers plant and could further be used in crop improvement.



CONCLUSIONS

The present study describes a simple and efficient protocol for plant regeneration from shoot tip explants of *Anthurium andraeanum* cv. HC 028. BAP at 4.0 mg/l was found to be the best concentration for PLB induction and shoot induction. The highest frequency of *in vitro* rooting was noted on MS medium augmented with 2.0 mg/l IBA. This study provides an efficient *in vitro* propagation method that could be commercially feasible for *Anthurium andraeanum* cv. HC 028 using a simple protocol for producing uniform plants in a relatively short period and with high multiplication rate. This protocol can be utilized for commercial scale propagation and conservation of this important plant species.

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***In Vitro* Propagation of an Endangered Medicinal Plant, Bat Flower; *Tacca Chantrieri* Andre. for Conservation in Thailand**

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ABSTRACT

In Thailand, bat flower (*Tacca chantrieri* Andre.) is found in the tropical rain forest and has been used in Thai folk medicine as well. Its values are not only for medicinal properties, but also the chemical compounds extracted from rhizomes which are able to fight against plant pest. At present, propagation of rhizome of *Tacca chantrieri* Andre. is at very low multiplication rate. Plant tissue culture is an alternative approach for large-scale plant multiplication. The sterile seeds were removed from sterilized freshy fruits (berry like) of *Tacca chantrieri* Andre. and cultured on the MS medium (Murashige & Skoog, 1962). The sterilized seeds germinated into seedlings. Shoot organogenesis occurred from *Tacca chantrieri* Andre. shoot explants inoculated on medium with appropriate supplements of plant growth regulators (N⁶-benzylaminopurine; BAP; 0, 1.0, 3.0, 5.0 or 7.0 mg/l). After 60 days, significantly multiple shoots were observed on shoot explants cultured on MS medium amended with 3.0 mg/l BAP compared to other BAP levels, with an average of 7.50 ± 0.08 shoots per explant, shoot length at 43.50 ± 0.11 mm and a frequency of shoot regeneration of 95%. In the second experiment, shoots from previous study were excised and cultured on different types of culture media (solid, semi-solid or liquid MS medium containing 3.0 mg/l BAP). The results showed that solid MS medium gave the highest percentage of shoot formation (95%), number of shoots (7.70 ± 0.02 shoots/explant) and shoot length (45.50 ± 0.05 mm) after culture for 60 days. Root induction occurred when regenerated shoots were cultured on MS medium supplemented with 3.0 mg/l IBA under photoperiod of 16/8 h (light/dark cycle) after culture for 45 days (95.50% of rooting, number of roots per explant at 20.86 ± 0.05 and root length at 42.30 ± 0.22 mm). Rooted plantlets were hardened and established in pots at 90% survival. The regeneration protocol developed in this study provides a basis for germplasm conservation and for the production of plant materials necessary to study the medicinally active components of *Tacca chantrieri* Andre.

Keywords: *Bat flower, Micropropagation, Plant regeneration, Shoot induction, Tacca chantrieri Andre*



INTRODUCTION

Bat flower plant (*Tacca chantrieri* Andre.) is perennial, distributes in the tropical regions of Asia (Yokosuka, Mimaki, Sakuma, & Sashida, 2005). Its rhizome has been used in folk medicine and recently the isolated compounds of four new spirostanol saponins, along with one known saponin have been evaluated for their cytotoxicity against HL-60 human promyelocytic leukemia cells (Yokosuka, Mimaki, & Sashida, 2002). In Thailand, bat flower is found in the tropical rain forest and has been used in Thai folk medicine as well (Wutthithamawet, 1997). Its values are not only for the medicinal properties, but also for the chemical compounds extracted from rhizomes which are able to fight against plant pest (Nuanla & Sruamsiri, 2000).

As demand has increased for *Tacca chantrieri* Andre., there is an urgent need to develop methods for the efficient propagation and conservation of this plant. Conventional propagation methods using seeds are ineffective due to the high mortality rate of the seedlings in the early stages of growth, while the use of rhizomes for vegetative propagation may destroy the already endangered mother plants. *In vitro* propagation techniques provide useful systems for the mass multiplication and germplasm conservation of many threatened plant species (Liu, Murch, Jain, & Saxena, 2004a; Liu, Murch, El-Demerdash, & Saxena, 2004b) and offer great potential for the propagation of plant species, such as *Tacca chantrieri* Andre.

MATERIALS AND METHODS

Source of explants and surface sterilization

The fresh fruits of *Tacca chantrieri* Andre. were harvested from plants grown in the greenhouse at Faculty of Science and Technology, Nakhon Si Thammarat Rajabhat University (Figure 1). The fresh fruits were first washed with tap water and a few drop of detergent (Teepol), and then rinsed with water 2-3 times. They were surface sterilized using 10% Clorox® (5.25% sodium hypochlorite, NaOCl) for 20 minutes followed by rinsing three times with sterile distilled water. They were again surface sterilized for another 5% Clorox® (5.25% sodium hypochlorite, NaOCl) and 2-3 drops of Tween 20 per 100 ml solution for 10 minutes. The treated fresh fruits were washed three times with sterile distilled water to remove traces of disinfectant. Finally the sterilized seeds from the surface-sterilized fresh fruits were cultured on MS (Murashige & Skoog, 1962) medium supplemented with 3% (w/v) sucrose to promote seedlings growth for 45 days.

Medium and culture conditions

Basal MS medium without any PGRs was used as control. All culture media were supplemented with 3% sucrose and gelled with 0.76% agar and adjusted to a pH of 5.7 with 1 N KOH or 1 N HCl prior to autoclaving at 1.05 kg/cm², 121°C for 15 minutes. All cultures were maintained at 25±2°C under a 16 h photoperiod with light supplied by cool-white fluorescent lamps at an intensity of 10 µmol m⁻² s⁻¹ photosynthetic photon flux density (PPFD).

Effects of BAP concentrations incorporated in MS medium on shoot formation of Tacca chantrieri Andre. after culture for 60 days

The shoots of *Tacca chantrieri* Andre. (1.5 cm in size) were sectioned from the 45-day-old seedlings (approximately 3.5 cm height) and cultured on MS medium (Murashige & Skoog, 1962) supplemented with N⁶-benzylaminopurine (BAP) at 0, 1.0, 3.0, 5.0 or 7.0 mg/l. The percentage of shoot formation, number of shoots per explant and shoot length (mm) were scored and compared statistically after 60 days of culture.



Effect of media types on shoot multiplication of Tacca chantrieri Andre. after culture for 60 days

For shoot proliferation, shoots from previous study were excised and cultured on different types of culture media (solid, semi-solid or liquid MS medium containing 3.0 mg/l BAP). The frequency of shoot formation (%), number of shoots per explant and shoot length (mm) were scored and compared statistically after 60 days of culture.

Effect of IBA on rooting of Tacca chantrieri Andre. regenerated shoots after culture for 45 days

For root induction, elongated shoots (2.0 cm) were cultured on MS medium augmented with Indole-3-butyric acid; (IBA) at 0, 0.5, 1.0, 1.5, 2.0, 2.5 or 3.0 mg/l. The rooting percentage, number of roots per explant and roots length (mm) were recorded and compared statistically after 45 days of culture.

Greenhouse Acclimatization

In vitro rooted plantlets of *Tacca chantrieri* Andre. were taken out from culture bottles and carefully rinsed thoroughly with tap water to remove all traces of agar. The plantlets were then transplanted into plastic pots containing a mixture of organic soil and sand (1:1) in the greenhouse. All plantlets were covered with polyethylene bags in order to maintain high humidity. After 15 days, the polyethylene covers were removed. The percentage of plantlet survival was recorded at 30 days of acclimatization.

Experimental design and statistical analysis

Experiments were performed in a completely randomized design (CRD). The data were analyzed by ANOVA using SPSS (version-20) and the mean values were compared using Duncan’s multiple range test at a 5% probability level.

RESULTS

Effects of BAP concentrations incorporated in MS medium on shoot formation of Tacca chantrieri Andre. after culture for 60 days

The sterilized seeds were germinated on the MS medium (Murashige & Skoog, 1962). Shoot explants of *Tacca chantrieri* Andre. were inoculated on MS medium supplemented with varying levels of N⁶-benzylaminopurine (BAP) for the induction of shoot regeneration. After 60 days, significantly multiple shoots were observed on shoot explants cultured on MS medium amended with 3.0 mg/l BAP compared to the other BAP levels, with an average of 7.50 ± 0.08 shoots per explant, shoot length at 43.50 ± 0.11 mm and a frequency of shoot regeneration of 95 % (Table 1). The percent of shoot formation and number of regenerated shoots increased with increasing the concentrations of BAP up to 3.0 mg/l; thereafter, shoot formation and number of regenerated shoots was gradually decreased with further increase the concentration of BAP (Table 1).

Table 1. Effects of BAP Concentrations Incorporated in MS Medium on Shoot Formation of *Tacca Chantrieri* Andre. after Culture for 60 days.



BAP concentrations (mg/l)	Shoot formation (%) (mean ± SE)	Number of Shoots/explant (mean ± SE)	Shoot length (mm) (mean ± SE)
0	30 ^d	1.50 ± 0.10 ^d	20.50 ± 0.12 ^c
1.0	50 ^c	3.50 ± 0.12 ^c	30.50 ± 0.07 ^b
3.0	95 ^a	7.50 ± 0.08 ^a	43.50 ± 0.11 ^a
5.0	65 ^b	4.10 ± 0.15 ^b	30.80 ± 0.05 ^b
7.0	50 ^c	1.60 ± 0.50 ^d	18.80 ± 0.09 ^c

Similar letter within the same column mean no significant difference at $P \leq 0.05$ by DMRT.

Effect of media types on shoot multiplication of *Tacca chantrieri* Andre. after culture for 60 days

In the second experiment, shoots from previous study were excised and cultured on different types of culture media (solid, semi-solid or liquid MS medium containing 3.0 mg/l BAP). The results showed that solid MS medium gave the highest percentage of shoot formation (95%), number of shoots (7.70 ± 0.02 shoots/explant) and shoot length (45.50 ± 0.05 mm) after culture for 60 days (Table 2).

Table 2. Effect of Media Types on Shoot Multiplication of *Tacca chantrieri* Andre. after Culture for 60 days.

Basal media (mg/l)	Shoot formation (%) (mean ± SE)	Number of Shoots/explant (mean ± SE)	Shoot length (mm) (mean ± SE)
Solid medium	95 ^a	7.70 ± 0.02 ^a	45.50 ± 0.05 ^a
Semi-Solid medium	70 ^b	5.15 ± 0.12 ^b	35.50 ± 0.15 ^b
Liquid medium	20 ^c	3.50 ± 0.05 ^c	25.50 ± 0.11 ^c

Similar letter within the same column mean no significant difference at $P \leq 0.05$ by DMRT

Effect of IBA on rooting of *Tacca chantrieri* Andre. regenerated shoots after culture for 45 days

For root induction, elongated shoots (2.0 cm) were cultured on MS medium supplemented with Indole-3-butyric acid; (IBA) at 0, 0.5, 1.0, 1.5, 2.0, 2.5 or 3.0 mg/l. Root induction occurred when regenerated shoots were cultured on MS medium supplemented with 3.0 mg/l IBA under photoperiod of 16/8 h (light/dark cycle) after culture for 45 days (95.50 % of rooting, number of roots per explant at 20.86 ± 0.05 and root length at 42.30 ± 0.22 mm) (Table 3).

Table 3. Effect of IBA on Rooting of *Tacca chantrieri* Andre. Regenerated Shoots after Culture for 45 days.

IBA concentrations (mg/l)	Rooting (%)	Number of roots per explant (mean±SE)	Root length (mm) (mean±SE)
0	20.50 ^e	3.25 ± 0.05 ^d	5.12 ± 0.05 ^c
0.5	33.30 ^d	3.95 ± 0.38 ^d	10.68 ± 0.21 ^d
1.0	45.50 ^c	8.51 ± 0.21 ^c	17.90 ± 0.23 ^c
1.5	50.50 ^c	8.58 ± 0.12 ^c	18.50 ± 0.11 ^c
2.0	80.50 ^b	12.0 ± 0.03 ^b	28.83 ± 0.16 ^b
2.5	93.00 ^a	19.52 ± 0.15 ^a	40.05 ± 0.15 ^a
3.0	95.50 ^a	20.86 ± 0.05 ^a	42.30 ± 0.22 ^a

Similar letter within the same column mean no significant difference at $P \leq 0.05$ by DMRT.



Greenhouse Acclimatization

Plantlets of *Tacca chantrieri* Andre. with well-developed root systems were taken out from culture bottles and carefully rinsed thoroughly with tap water to remove all traces of agar. The plantlets were then transplanted into plastic pots containing a mixture of organic soil and sand (1:1) in the greenhouse, and about 90 % developed normally (Figure 1).

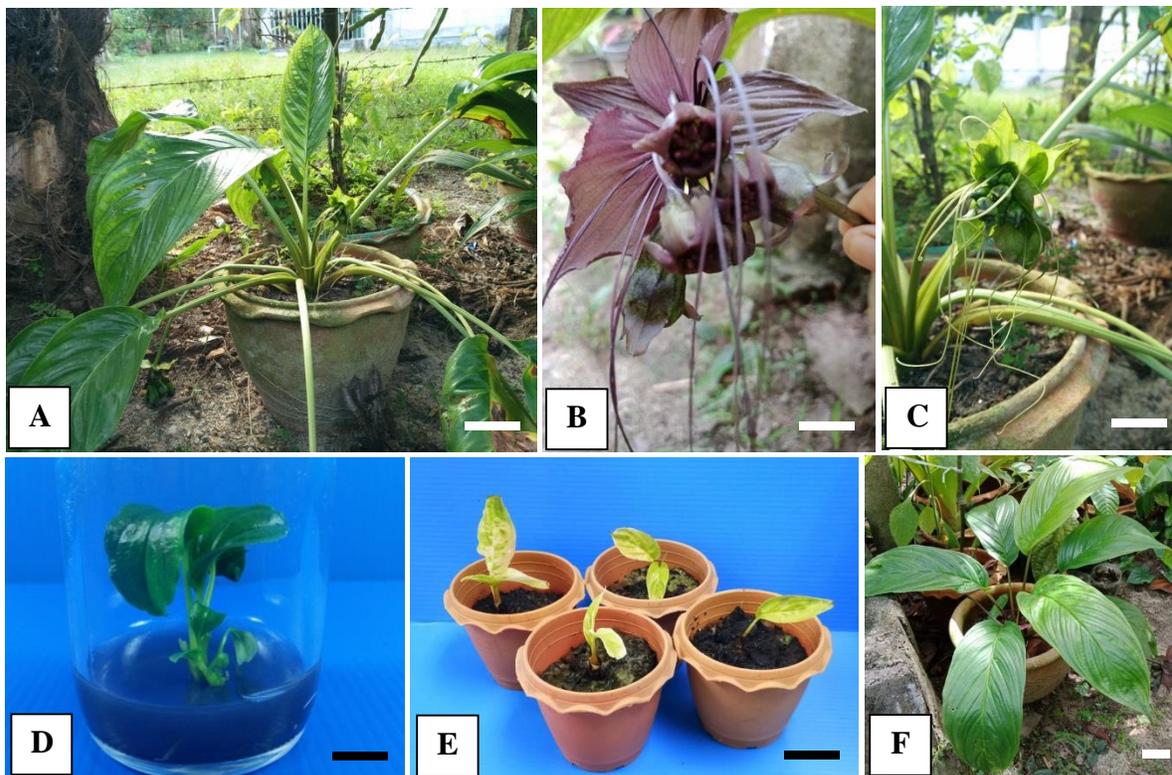


Figure 1. Micropropagation of *Tacca Chantrieri* Andre. (A); Plant, (B); Flowers, (C); Fruits, (D); Rooting of regenerated shoots on MS medium supplemented with 3.0 mg/l IBA after 45 day culture, (E); Micropropagated plants transplanted to organic soil and sand (1:1) after 30 day and (F); One-year-old plantlet (Scale bar=1 cm).

DISCUSSION

An efficient protocol for the *in vitro* micropropagation of *Tacca chantrieri* Andre., an endangered Thai medicinal plant, was developed. In plant tissue culture system, the balance between auxin and cytokinin plays an important role in determining the morphogenetic development of an explant (Gaspar *et al.*, 1996). BAP was surprisingly effective for shoot formation from shoot explants of *Tacca chantrieri* Andre. Similar results were recorded for other medicinal plants, including *Bacopa monnieri* (L.) Wettst and *Stevia rebaudiana* (bert) in which large numbers of shoots were regenerated in response to BAP (Kaur, Nautiyal, & Pant, 2013; Thiagarajan & Venkatachalam, 2012). The presence of cytokinins in the medium was essential to induce bud break and shoot proliferation from explants.

The role of Auxin is well established for enhancing rooting (Tiwari, Tiwari, & Singh, 2000). In the present study, IBA at 3.0 mg/l concentration proved to be the most efficient for rooting. IBA has been found to enhance



rooting in *Bacopa* (Ceasar, Maxwell, Prasad, Karthigan, & Ignacimuthu, 2010); while, it is contradictory to earlier reports in which IAA with other PGR has been used for enhancing roots (Chaplot, Dave, & Jasrai, 2005; Gurnani, Kumar, Mukhija, Dhingra, Rajpurohit, & Narula, 2012).

CONCLUSIONS

In conclusions, this report describes a rapid protocol for multiple shoot regeneration from shoot explants of *Tacca chantrieri* Andre. This study provides an efficient *in vitro* propagation method that could be applied for conservation of *Tacca chantrieri* Andre. using a simple protocol for producing uniform plants in a relatively short period and with high multiplication rate. This protocol can be utilized for conservation of this important medicinal plant species.

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Expert System to Diagnose the Risk of Depression in the Elderly

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ABSTRACT

The objective of expert system development to diagnose the risk of depression in the elderly was to find the knowledge set to build a system of experts to find the risk of depression in the elderly. The result of the risk assessment results were analyzed from a survey of 2 query forms, and 8,320 sample data groups, with a procedure based on the study of data analysis and the creation of data tables to create the knowledge. The knowledge of the system in the form of If-then rules in the design process, which was a tree deciding to create a condition to diagnose the risk of 4 levels including normal, low, moderate, and severe level of if-then rules. The total 786,433 rules by using mechanisms in the forward chaining for the risk diagnosis and that the rules were accurate of overall model as 98.85 percent, and in the development process, the If-then rules applied to develop the system with questions answered to the user, diagnosing risk and final operation of the system test and maintenance.

Keywords: *Diagnose, Elderly, Expert System, Risk of Depression*

INTRODUCTION

Thailand’s social structure of population is being changed into an aging society. The United Nations (UN) defines that the country with more than 10 percent of country’s population aged 60 years or more than 7 percent of country’s population aged 65 is considered that the country has entered the aging society. For Thailand, seniors are defined in the Act 2546 that means the elderly aged 60 years and over (Promtpat, 2013).

Seniors are the age ranges faced with changing economic, social and physical. Due to the aging of the post-retirement, revenue decreased a social decline the development of the body's deterioration in the structure and function of every organ system resulting in a debilitating health problem easily. Seniors over 40 percent have at least one underlying disease and are more likely to have the disease increasing with age (Junotaan, Kanjanapongsakul, Chaipak, & Kultonabot, 2541). Such changes are the stimuli that encourage seniors to have to adapt. Seniors show whether adaptive behavior is appropriate or not based on the acceptance of climate change. If seniors do not accept the changes, it may lead to behavioral adaptation improper or depression. A condition in which emotions are expressed by depression deserted despair that they feel worthless And often blame themselves accompanied by physical symptoms such as sluggish to say the least (Sadock, 2000)



This research was the application of expert systems. The survey analyzed the health of the elderly to determine the risk of developing depression with him by bringing knowledge from text books and expert to create a knowledge base in a decision tree (Ratpradit & Juntrapornchai, 2012) and then converted to the form of If-then rules by the terms of the law including the results of the health survey (Tiensaard & Aimsombat, 2012), and a mechanism to deduce a forward to find the answer to a preventive approach in their practice. This led to behavioral change on a daily basis to reduce the risk of developing depression as well as to guide the doctor to get advice from this information.

LITERATURE & THEORY

1. The expert system is an information system that brings science of artificial intelligence to handle knowledge to assist in troubleshooting decisions or simulate human decisions that are from specialists using inferential knowledge and deductive reasoning to solve a problem that requires a specialist. It is related to knowledge management and is designed to help you make decisions in the same way as human expert. The expert system is software used to create a knowledge base, mechanisms for questioning and the answer is an answer to the question like real experts.

2. Elderly or commonly known as the old man or old people was identified by dictionary definition of the word in 1999 in old age or damaged to deteriorate. It is also called elderly senior citizen. World Health Organization (WHO) and United Nations (UN) use the word in English that elderly is older person or elderly person.

3. Depression, mental care center in Bangkok defines that depression is a disorder of the brain that affects the mind, emotion, behavior and physical health. However, most people tend to think that depression is a result of mental disorder that you can recover it yourself. In fact, depression is a disease caused by an imbalance of neurotransmitters called serotonin consisted of 3 types including dopamine, norepinephrine and serotonin.

RELATED WORDS OR DISCUSSION

Nowadays, many researchers are focusing on application of technology in everyday life more to enhance the performance or quality of life. In particular, the expert system can be applied to the following areas.

Ratchpradit and Juntrachai (2012) developed expert system to diagnose rice from diseases caused by pathogens such as bacteria, fungi, viruses, and 3 groups of 16 diseases. The results showed that the system could meet with specialists diagnosed up to 94.5 percent.

Tiensaard and Aimsombat (2012) developed the system to diagnose and advise patients with CKD using knowledge base ontology by bringing knowledge from textbooks and nursing hemodialysis. The results showed that the expert system could diagnose the problem and provided recommendations to the patients as well. The accuracy (Precision) was found at 96.89 percent and the remembrance (Recall) was found at 95.39 percent compared to the answers of the dialysis nurse. Rintal (2552) developed a tour guide in relation to information to advice and inform various locations of the six Andaman provinces. The trial compared the accuracy with tour companies found that the accuracy of the system was 72.40 percent compared with tour companies.

Development of an automated online decision support system for the selection of subjects to students of higher education which developed by Utamunee and Pranedpolkarung (2010) modeled building for factors that influence decision-making in the field of study of students. Develop models and decision support systems of automated online to guide to the field of study of students in higher education found that the model probabilities using data mining techniques by way of Bay Networks could indicate the key



variables affecting the decision in the field of study of students in higher education, and the accuracy in predicting was found high with the value of 91.35 percent.

Expert system helped diagnose the risk of NCDs was developed by Tachpetpaiboon (2559) which the system had developed a set by the search for knowledge building system experts to help find the risk of disease from NCDs annual health check results of blood tests and diagnosed 10 types of the risk. The accuracy of the model was found as a whole of 99.27 percent.

Systems and diagnosis of allergies developed by Dekrom (2012) started from storing of knowledge, building a knowledge base, creating rules to deduce the logic of probability. The study indicated that expert system was able to diagnose different types of allergies. The system could help diagnose and the accuracy was greatly close to experts.

A survey of depression in patients with chronic by Jaratseng (2012) found that AIDS patients was a group with the most severe level of depression followed by cancer and diabetes respectively. Additionally, survey research on depression of Chunjam (2011) found that research on depression of physical patients in adults and the elderly was most studied. It lacked of studies on mental patients or the risk of depression among caregivers as workers, and so on.

METHODS

The study was to develop the expert system to help diagnose the risk of depression in the elderly. Start from analyzing the process by considering the demand, appropriateness, and feasibility of implementation in real-life situations by understanding the problem, the steps in the solution of problem, the format of the answer, as well as knowledge and understanding of the material to be developed. According to studies, it found that diagnosing the risk of depression in the elderly was determined by respondents from the rough questionnaire (PHQ-2) which was a screening questionnaire for the elderly prone to depression. The questionnaire contained 2 questions to answer. These two questions were based on the responses of older people to answer "no" to both questions which showed that older people were not suffering from depression. In contrast, if the elder replied "A" in Article 1 or 2 or both, it meant that older people were more prone to depression. The questionnaire in detail (PHQ-9) used for further consideration.

The risk of depression was considered by the scores. If the total score less than 7, it considered normal. If scores were between 7 and 12, it considered a low-level depression, advised to go to the doctor and then return to life as normal. If the scores were between 13 and 18, it considered a moderate. Additionally, if scores were 19 or more, it was considered as severe. Therefore, elders who had scores more than 13 were considered need to receive treatment from psychiatrists, and for those who had scores more than 7, they need to complete the assessment of suicide (PHQ-8) as well.

The analysis system was a summary of the survey questionnaire forms including, general questionnaire (PHQ-2), detailed questionnaire (PHQ-9), and suicide assessment questionnaire (PHQ-8) which were showed in Table 1.

Table 1.

Summary of exploration and evaluation results

Questionnaires	Range of Scores	Evaluation Results	Suggestions
General Questionnaire (PHQ-2)	replied, "there are not" in both two questions	normal	-
	replied, "there are" one or two questions	Tend to get depressed	Respond to the questionnaire PHQ-9
Detailed Questionnaire (PHQ-9)	less than 7	normal	-
	between 7 to 12	low degree of the risk of developing depression	Respond to the questionnaire PHQ-8
	between 13 and 18	moderate degree of the risk of developing depression	Respond to the questionnaire PHQ-8



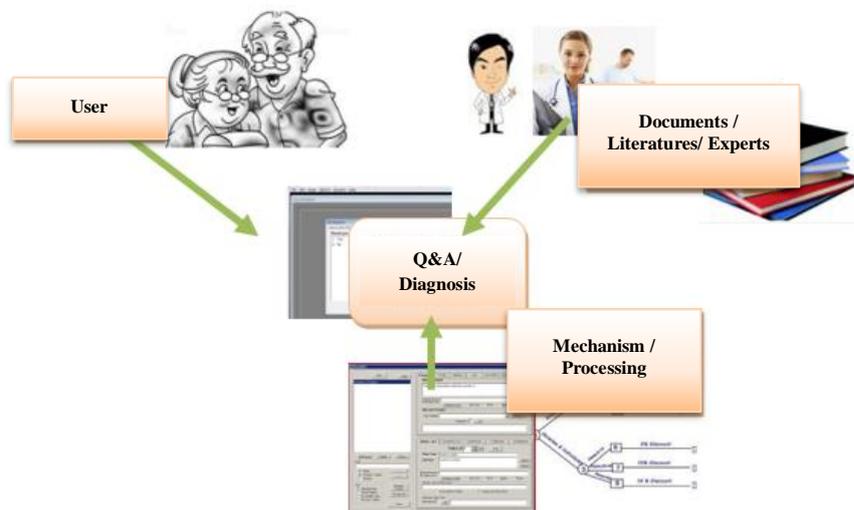
	over 19	severe degree of the risk of developing depression	Respond to the questionnaire PHQ-8
Suicide Assessment Questionnaire (PHQ-8)	between 1-8	low degree of committing suicide	Receive doctor's advice
	between 9-16	moderate degree of committing suicide	Receive doctor's advice
	Over 19	severe degree of committing suicide	Closely receive medical care

From the table, it showed that assessing the risk of depression in the elderly started from the elderly respondents consisting of 2 general questions. If the elder replied, "there are" one or two questions, it considered that they had the risk of depression. By conducting a risk assessment for depression consisting of 9 questions, and each has a variance score, if an older respondent rating and had scores at least 7, it showed that normal, but if it had scores between 7 to 12, it showed that the risk of developing depression, to a lesser degree. Subsequently, scores between 13 and 18 were considered moderate, and when scores over 19, it considered severe. The elderly who had scores more than 7 were considered to complete the assessment of suicide (PHQ-8) to determine the likelihood of suicide at any level.

In designing the system, this step processed the data and obtained into the analysis to consider what was to evaluate. When the system initially completed, it was needed to design a context diagram. The creation of a hierarchy of valuation adjustments to answer a question like query that consisted of questions and answers that the answer used to acquire the image.

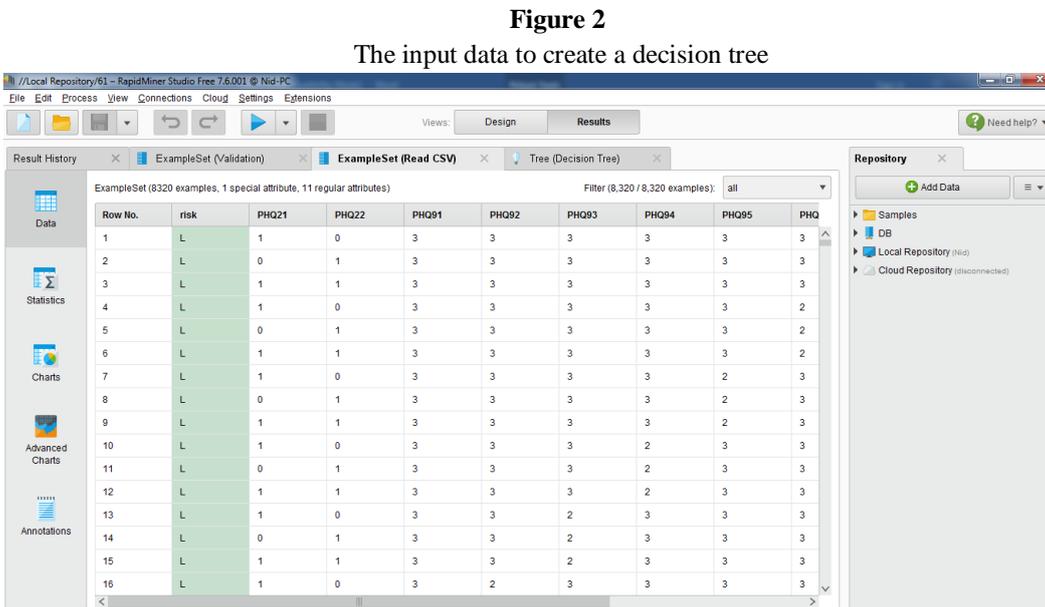
Figure 1.

Context diagram of an expert system to help diagnose the risk of depression

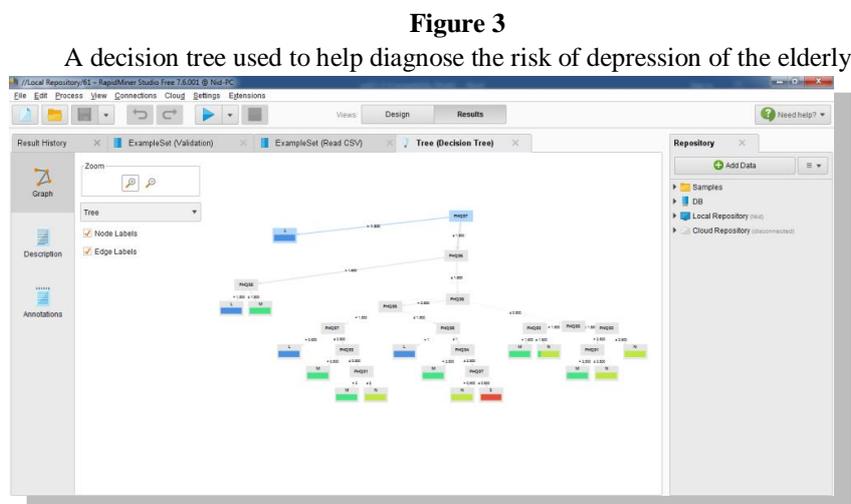


The picture showed a diagram of the expert system context started by answering user questions in the system. From the rough form questionnaire (PHQ-2) and a detailed questionnaire (PHQ-9), the system would consider a number of questions that must be answered by the responses of the user. The system then processed the data, and showed the diagnosed data on the display.

The next step was to develop the system. From the diagram context made to the design including criteria or features collected primarily as in Table 1. The summary of exploration and evaluation results, at this stage, would be converted into information that led to the process. The development of the system for creating decision trees was shown as in Table 2.



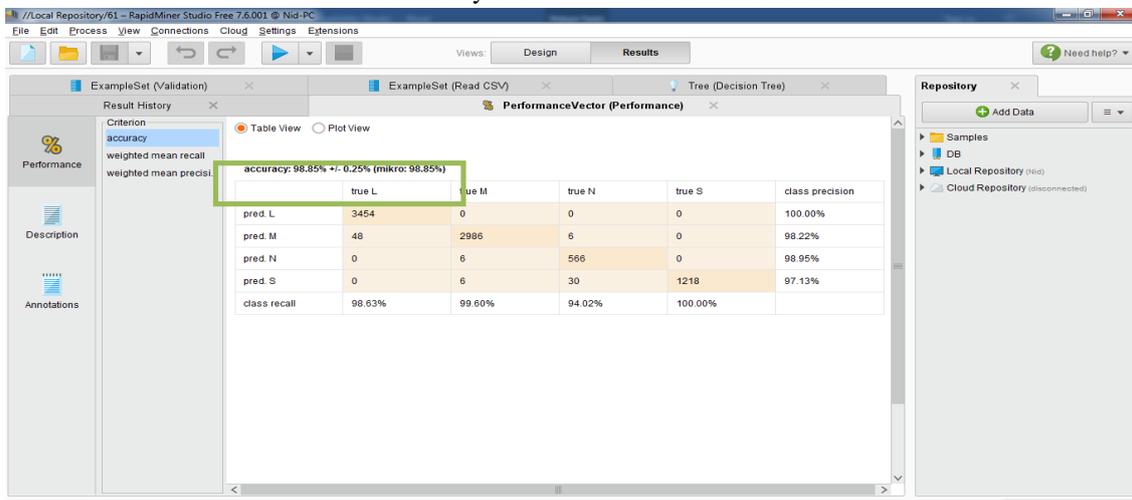
The data obtained from the analysis was converted to Table that was ready to be introduced into the process of creating a decision tree with software RapidMiner studio as in decision tree Figure 3.



After the process, the validity was determined with the model. The picture showed the accuracy of the model decision tree of the expert system to help diagnose the risk of depression in the elderly accounted for 98.85 percent.

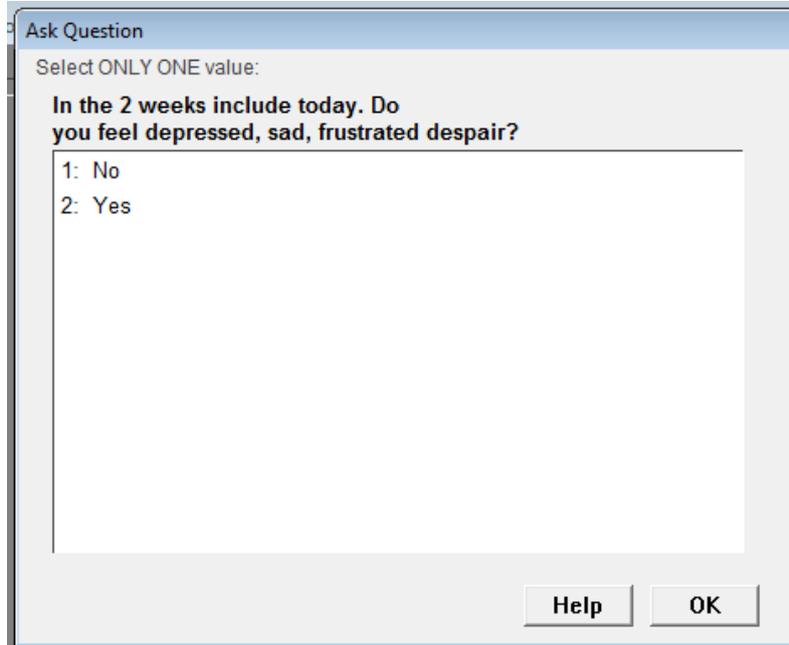


Figure 4
The accuracy of the model overall decision tree



The next step was to separate the section of question by clearly answer. Then put data into the system. To understand the If-then rules, which was the process of creating a database to create variable conditions and create the display. The image previewed screen of questions for users.

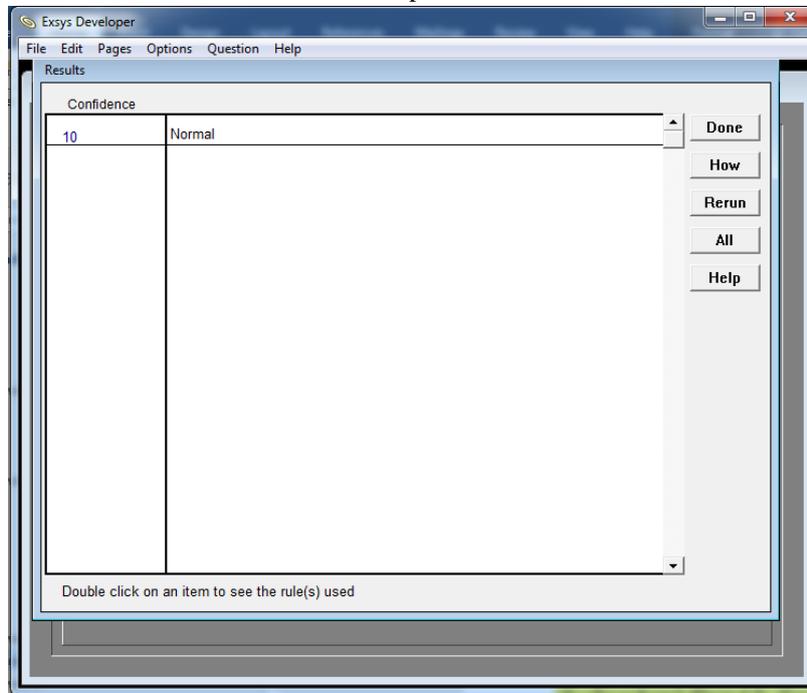
Figure 5
A screen to put information into the system



The image was the example of input screen of the system. The system had to question and answers to learn values, such as Yes / No, which the user must select one by bringing the mouse to click on the desired item, then click OK to the next question. When the user fulfilled the list, the system displayed the diagnosis risk for depression as shown below.



Figure 6.
Example of screen



The picture showed that the diagnosis of the risk of depression in the elderly had no risk of depression. The user could use the results of this diagnostic approach to be proactive in its implementation. This led to behavior change on a daily basis to have good health or to guide the doctor to get advice from this information.

For evaluation of expert system to help diagnose the risk of depression in the elderly, it could diagnose the risk of disease by considering the overall accuracy of the model (accuracy) accounted for 98.85 percent, and the next step was to complete the installation, testing, and maintenance. The final step was to install the system, test the usability and improve to the accreted system and up date.

RESULTS

This research study was conducted to develop an expert system to help diagnose the risk of depression in the elderly with data from a sample of 8,320 items. Table showed the data to be brought into the process and development to build a decision tree.



Table 4. Data examples was put into the system to create a decision tree

221	222	911	912	913	921	922	923	931	932	933	941	942	943	951	952	953	961	962	963	971	972	973	981	982	983	991	992	993		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N
1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	N	
1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	S	
0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	S	
0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	S
1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	S
1	1	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	M
0	1	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	M
0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	N
0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	N
0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	N
0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S
0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	N
0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	0	0	1	0	M
0	1	1	0	0	0	1	0	1	0	0	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	0	0	1	0	M
0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	S
0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	S
0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S
0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S
0	1	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	M
0	1	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	M

The table indicated values in order to diagnose. The value that had been identified as one meant the outliers on the list and was identified as 0 referred to the normal schedule to that. At first line, there was no irregularity in the list. The result was that the diagnosis showed no risk of the disease appeared as N, the risk of disease or normal. The first four values were specified in the list of 221, 911, 983 and 993 meant that there was a positive response on the part. PHQ-2 (No. 1) PHQ-9 (Article 1. Post level 1) PHQ-9 (Article 8. Post level 3) PHQ-9 (Article 9. Post level 3), where the diagnosis was given. There was a risk of the disease S, which meant there was a risk of disease found low level. Such risk factors detailed in the table below.

Table 5. Risk factors for the disease

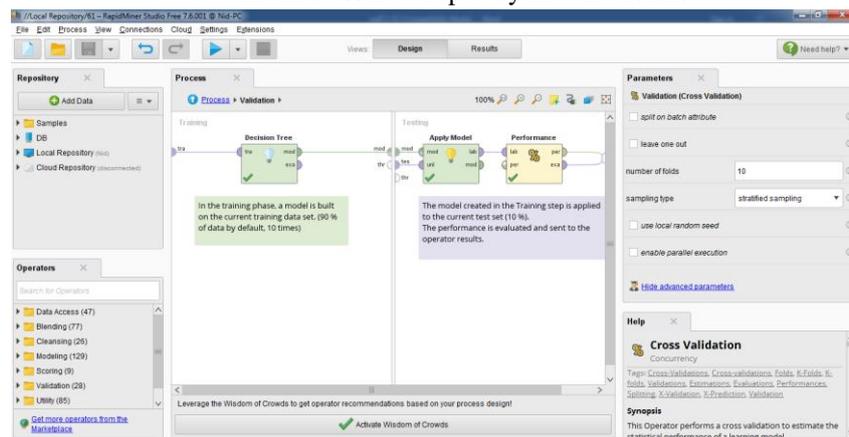
รหัสข้อ	รายการ
221	ในช่วง 2 สัปดาห์ที่ผ่านมาคุณรู้สึก หดหู่ เศร้า ท้อแท้สิ้นหวังหรือไม่
222	ในช่วง 2 สัปดาห์ที่ผ่านมา ท่านรู้สึกเบื่อ ทำอะไรก็ไม่มีพลังเพลินหรือไม่
911	เมื่อไม่สนใจอยากทำอะไร บางวัน (น้อยกว่า 7 วัน)
912	เมื่อไม่สนใจอยากทำอะไร บ่อย (มากกว่า 7 วัน)
913	เมื่อไม่สนใจอยากทำอะไร ทุกวัน
921	ไม่สบายใจ ซึมเศร้า ท้อแท้ บางวัน (น้อยกว่า 7 วัน)
922	ไม่สบายใจ ซึมเศร้า ท้อแท้ บ่อย (มากกว่า 7 วัน)
923	ไม่สบายใจ ซึมเศร้า ท้อแท้ ทุกวัน
931	หลับยาก หรือหลับ ตื่นๆ หรือหลับมากเกินไป บางวัน (น้อยกว่า 7 วัน)
932	หลับยาก หรือหลับ ตื่นๆ หรือหลับมากเกินไป บ่อย (มากกว่า 7 วัน)
933	หลับยาก หรือหลับ ตื่นๆ หรือหลับมากเกินไป ทุกวัน
941	เหนื่อยง่าย หรือไม่ค่อยมีแรง บางวัน (น้อยกว่า 7 วัน)
942	เหนื่อยง่าย หรือไม่ค่อยมีแรง บ่อย (มากกว่า 7 วัน)
943	เหนื่อยง่าย หรือไม่ค่อยมีแรง ทุกวัน
951	เบื่ออาหาร หรือกินมากเกินไป บางวัน (น้อยกว่า 7 วัน)
952	เบื่ออาหาร หรือกินมากเกินไป บ่อย (มากกว่า 7 วัน)
953	เบื่ออาหาร หรือกินมากเกินไป ทุกวัน
961	รู้สึกไม่ดีกับตัวเอง คิดว่าตนเองล้มเหลวหรือทำให้ตัวเอง หรือครอบครัวผิดหวัง บางวัน (น้อยกว่า 7 วัน)
962	รู้สึกไม่ดีกับตัวเอง คิดว่าตนเองล้มเหลวหรือทำให้ตัวเอง หรือครอบครัวผิดหวัง บ่อย (มากกว่า 7 วัน)
963	รู้สึกไม่ดีกับตัวเอง คิดว่าตนเองล้มเหลวหรือทำให้ตัวเอง หรือครอบครัวผิดหวัง ทุกวัน
971	สมาธิไม่ดีเวลาทำอะไร เช่น ดูโทรทัศน์ ฟังวิทยุ หรือทำงานที่ต้องใช้ความตั้งใจ บางวัน (น้อยกว่า 7 วัน)
972	สมาธิไม่ดีเวลาทำอะไร เช่น ดูโทรทัศน์ ฟังวิทยุ หรือทำงานที่ต้องใช้ความตั้งใจ บ่อย (มากกว่า 7 วัน)
973	สมาธิไม่ดีเวลาทำอะไร เช่น ดูโทรทัศน์ ฟังวิทยุ หรือทำงานที่ต้องใช้ความตั้งใจ ทุกวัน



The table was set parameters to determine the risk of developing the disease with 29 items. Form PHQ-2 consisted of 2 questions and form PHQ-9 was composed of 9 question with 3 options, the decision had all the conditions consisted of 786 433 conditions ($3 * 4^9 + 1$), then brought the data into the system by creating a tree decision as shown in figure 7.

Figure 7.

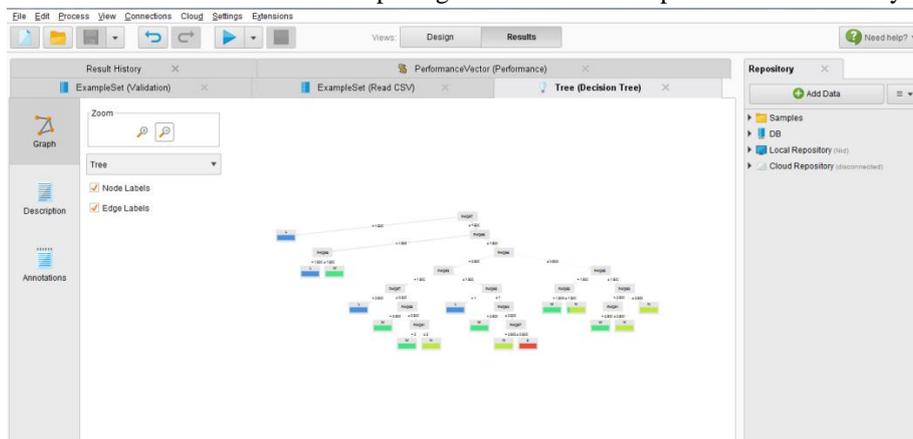
The Process Developed by Tree Decisions



A total of 8,320 items of information were put into the process with Rapid miner Studio using the operator's decision tree as shown in figure 8

Figure 8.

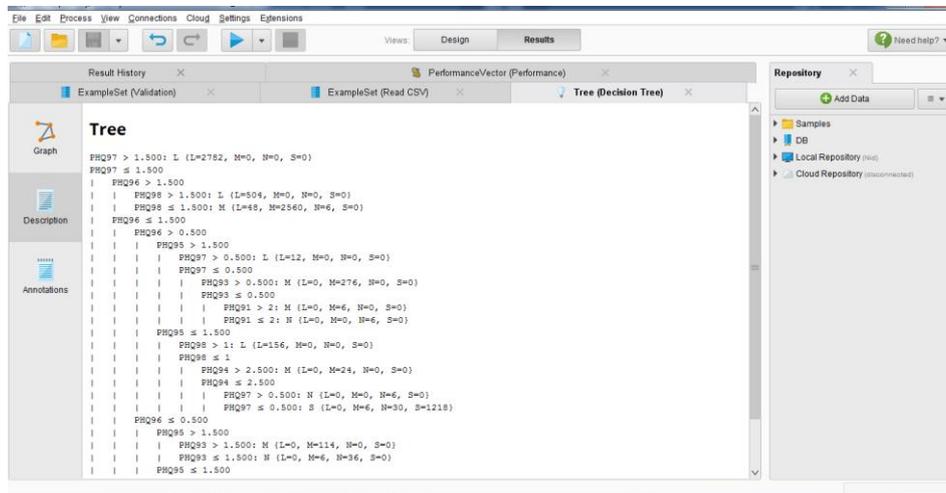
Tree Decisions used to Help Diagnose the Risk of Depression in the Elderly



The image was a decision tree used to create the conditions If-then diagnosing the risk of depression in the elderly as Figure 9 showed the detailed conditions.

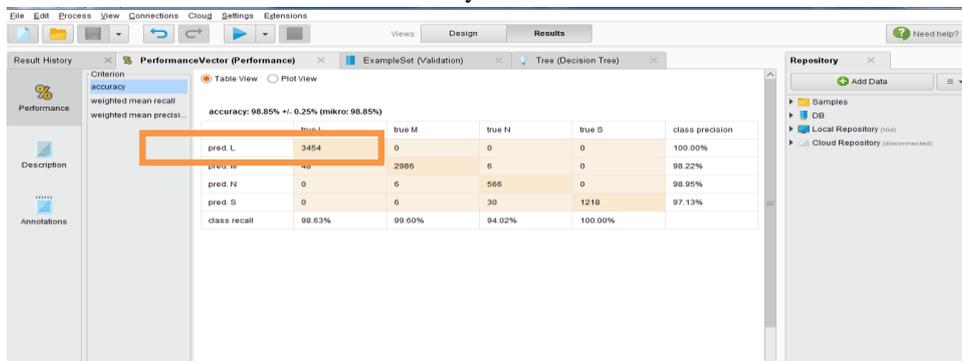


Figure 9.
The Detailed Conditions



From the Figure 10, it showed that the terms of conditions were 786,433 and the overall accuracy of the model of the decision tree represented 98.85 percent.

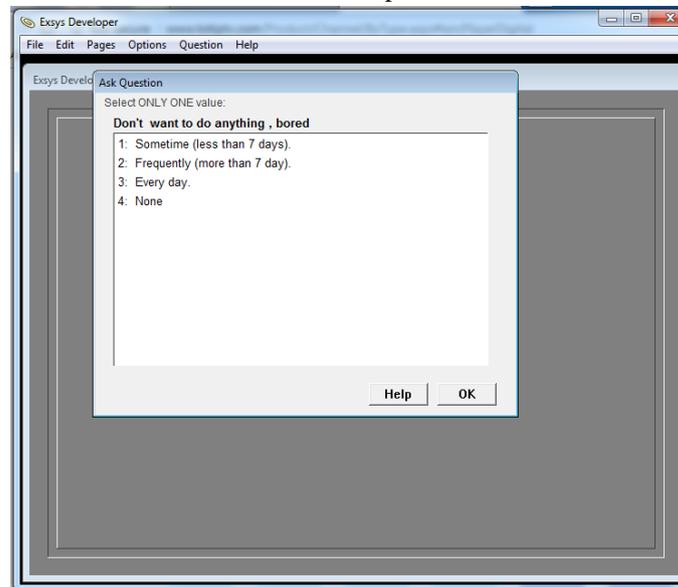
Figure 10.
Accuracy of Decision Tree



The next step was the condition of the tree used by identifying questions, answers for users to select and display diagnosed data with Exsys Corvid shown in Figure 11.



Figure 11.
Screen for Input the Data



The image was a screen used for inputting data into the system. The system would show questions and answers for users to select as shown in Table 6.



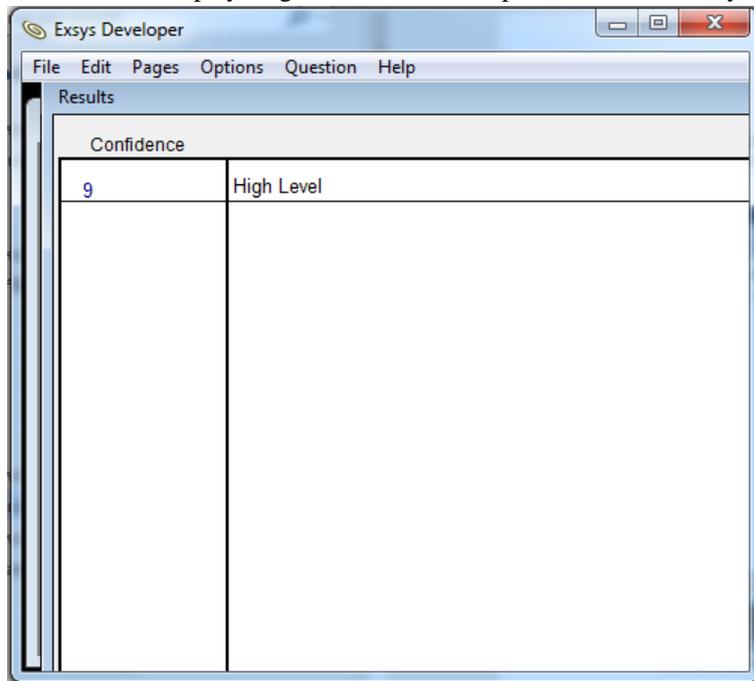
Table 6.
The Question and Answers for Users to Select

แบบฟอร์ม	คำถาม	คำตอบ 1	คำตอบ 2	คำตอบ 3	คำตอบ 4
PHQ-2 ข้อที่ 1	ในช่วง 2 สัปดาห์ที่ผ่านมาวันนี้ ท่านรู้สึก หดู่ เศร้า ท้อแท้ สิ้นหวังหรือไม่	Yes	No	-	
	In the 2 weeks include today. Do you feel depressed, sad, frustrated despair?				
PHQ-2 ข้อที่ 1	ในช่วง 2 สัปดาห์ที่ผ่านมา ท่านรู้สึกเบื่อทำอะไรก็ไม่เพลิดเพลินหรือไม่	Yes	No	-	
	In the 2 weeks. You feel bored, do whatever you do not enjoy or not.				
PHQ-9 ข้อที่ 1	เบื่อไม่สนใจอยากทำอะไร	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Don't want to do anything , bored	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None
PHQ-9 ข้อที่ 2	ไม่สบายใจ ซึมเศร้า ท้อแท้	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Uncomfortable, depressed, frustrated	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None
PHQ-9 ข้อที่ 3	หลับยาก หรือหลับ ตื่นๆ หรือหลับมากเกินไป	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Hard sleeper or to fall asleep, wake up or sleep too much.	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None
PHQ-9 ข้อที่ 4	เหนื่อยง่าย หรือไม่ค่อยมีแรง	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Tired or weak,	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None
PHQ-9 ข้อที่ 5	เบื่ออาหาร หรือกินมากเกินไป	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Anorexia, or eat too much.	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None
PHQ-9 ข้อที่ 6	รู้สึกไม่ดีกับตัวเอง คิดว่าตนเองล้มเหลวหรือทำให้ตัวเอง หรือครอบครัวผิดหวัง	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Feel bad about myself. I think themselves fail or make themselves or family down.	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None
PHQ-9 ข้อที่ 7	สมาธิไม่ได้เวลาทำอะไร เช่น ดูโทรทัศน์ ฟังวิทยุ หรือทำงานที่ต้องใช้ความตั้งใจ	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Feel bad about yourself. Think about something fail or make themselves or family down.	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None
PHQ-9 ข้อที่ 8	พูดช้า ทำอะไรช้าลงจนคนอื่นสังเกตเห็นได้ หรือกระสับกระส่าย ไม่สามารถอยู่นิ่งได้ เหมือนที่เขยเป็น	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Poor concentration, time to do, such as watching television, listening to the radio or work that requires intention.	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None
PHQ-9 ข้อที่ 9	คิดทำร้ายตนเอง หรือคิดว่าตายไปคงจะดี	บางวัน (น้อยกว่า 7 วัน)	บ่อย (มากกว่า 7 วัน)	ทุกวัน	ไม่มีเลย
	Harm yourself or think dead would be better.	Sometime (less than 7 days).	Frequently (more than 7 day).	Every day.	None

From the table, the first two questions were the PHQ-2 form. The system would check if the answer of the system asked for a form PHQ-9 of 9 items then diagnose the risk of depression. Figure 12 showed screen of the diagnosed risk of depression in the elderly.



Figure 12.
Screen display diagnosed the risk of depression in the elderly.

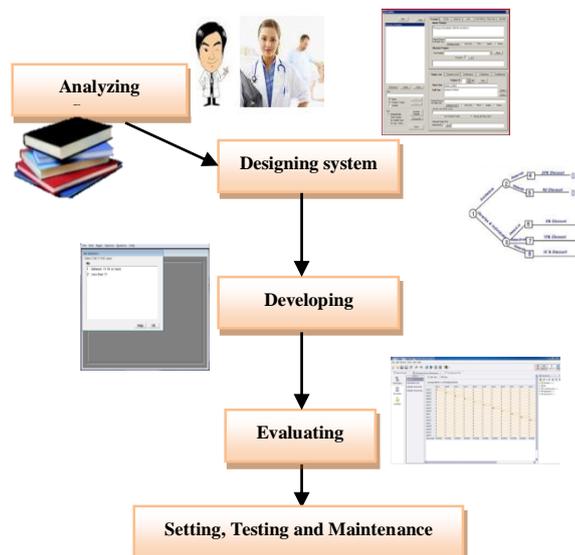


The picture showed that the result of the diagnosis of the risk of depression in the elderly user was high so that users could use their findings as a guide to conduct of preventive and self-care. This led to behavior change on a daily basis for good health, or to guide the doctor to get advice from this information.

CONCLUSION AND FUTURE WORK

Development of expert system helped diagnose the risk of depression in the elderly by bringing knowledge from text books and medical professionals to create a knowledge-based system in the form of the If-then rules of the respondents with 2 forms form the bulk sample 8,320 entries. The process started from system analysis, system design, system development and evaluation, installation, testing, and maintenance as shown the process image.

Figure 13.
Work flow





From the figure, the system started from studying analyzed data to create data tables to import data, and create a knowledge base of rules in the form of If-then rules in the design process. This was a decision tree to create the conditions to make the diagnosis. The risk had four levels which were normal, low, moderate, and severe evaluated by If-then rules with total number of 786,433 rules by using algorithms to infer a forward chaining to diagnose the risk. The accuracy of the model as a whole was 98.85 percent. The process of development led to the development of the If-then rules system. The question and answers used for users to select. The procedure was designed to answer questions, and the screen displayed diagnosis of the risk of the disease. Finally, it showed testing of the system and maintenance.

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Decision Support System Development for Avoiding Obesity

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ABSTRACT

A decision support system (DSS) for avoiding obesity was developed and evaluated in two facets, which were user friendliness and usefulness consisted of five-level Likert items (1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree) participated by 78 responses on online questionnaire. The DSS works by letting the user to select the food menu(s) and the number of each menu that they wanted in a day. Then DSS calculated total energy of all the menus selected and showed the total energy. After that, user selected his/her sex, and DSS would compare the total energy with the range of energy required per day for the user’s sex and showed the result in three cases: 1) too much 2) ok 3) less. The results from evaluation of DSS participated by 78 responses were presented that user friendliness was average (4.44), and usefulness was average (4.60).

Keywords: *Decision support system, Obesity*

INTRODUCTION

A decision support system (DSS) is a computer-based application program that collects, organizes, and analyzes the data to facilitate quality of decision-making for management, operations and planning. There were many DSS applications used in many fields which were a decision support system that supports decision-makers in choosing the most suitable database technology (Farshidi, Jansen, Jong, & Brinkkemper, 2018), DSS for urban emergency (Zhang & Li, 2008), DSS for enhancing the effectiveness of the decision support system in selected Universities in Zimbabwe (Ngwenya, 2013), DSS in E-commerce including customer service, better inventory control, lower marketing , distribution costs, reduced cycle time, increased market reach, and reduced operation costs (Velmurugan & Narayanasamy, 2008), bio-energy decision support systems (Wright, Dey, Brammer, & Hunt, 2011), DSS for increasing the effectiveness of municipal waste management (Rybnytska, Burstein, Rybin, and Zaslavsky, 2018), decision support approaches in adaptive forest management (Kašpar, Bettinger, Vacik, Marusk, and Garcia-Gonzalo, 2018), decision support systems in a tourism destination (Baggio & Caporarello, 2005), fuzzy decision support system to be employed in evaluation phase of Value Engineering methodology (Naderpajouh, Afshar, and Mirmohammadsadeghi, 2006), and a classification of modern decision support systems applied in the oil industry.

Decision Support Systems (DSS) are interactive computer-based systems that enable people to use IT communications, data, documents, knowledge and models to solve problems and make decisions. DSS are used in order to improve and speed-up the processes by which people make decision.

Obesity is defined as having a body mass index (BMI) of 30 or more. BMI is a calculation that takes a person’s weight and height into account. BMI has some limitations due to factors, such as age, sex, ethnicity, and muscle mass which can influence the relationship between BMI and body fat. Also, BMI



doesn't distinguish between excess fat, muscle, or bone mass, nor does not provide any indication of the distribution of fat among individuals.

A cause of obesity is eating calories more than burn it in daily activity (on a long term basis). These extra calories add up and cause gain weight.

Common specific causes of obesity:

- Eating high fat and calories food
- Inactive lifestyle
- Hormonal changes from not sleeping enough that make hungrier and take high-calories foods
- Genetics
- Getting older

Anyway many factors related to obesity are difficult to control. A factor that one can control oneself to avoid obesity is controlling of their calories to intake no more than calories used.

This research was a DSS development for support one to make decision in selecting the food and the amount of food to eat in a day in order to avoid obesity. This DSS had many menus of 657 menus, which user could choose and select amount of each menu. The DSS would automatically calculate the total calories of all menus selected by user and then compared the total calories with the normal range of calories used per day of the user's sex. After that, DSS showed the results that total calories of all the menus selected was ok or too much or less. So the user could decide what were the menu(s) and the amount of each menu he/she should have per day in order to avoid the obesity.

METHODOLOGY

DSS comprised of knowledge, model, and user interface.

Knowledge

The knowledge of food energy in each menu and normal range of calories used per day of office men and office women including:

- 657 menus with the calories of each menu
- Normal range of calories per day for officer (male and female)

DSS Model

Model of this DSS was shown in Figure 1. This DSS consisted of calories of each menu in 657 menus. The normal range of calories used per day of male and female. The total calories of all menus selected were compared with the normal range of calories used of user's sex then provided the results. There are three possible results which were ok, too much, and less. In case total calories intake was higher than normal range of calories used per day, the results would be “too much”. In case total calories intake was in normal range of calories used per day, the results would be “ok”. Finally, In case intake calories were less than normal range of calories used per day, then the results would be less.

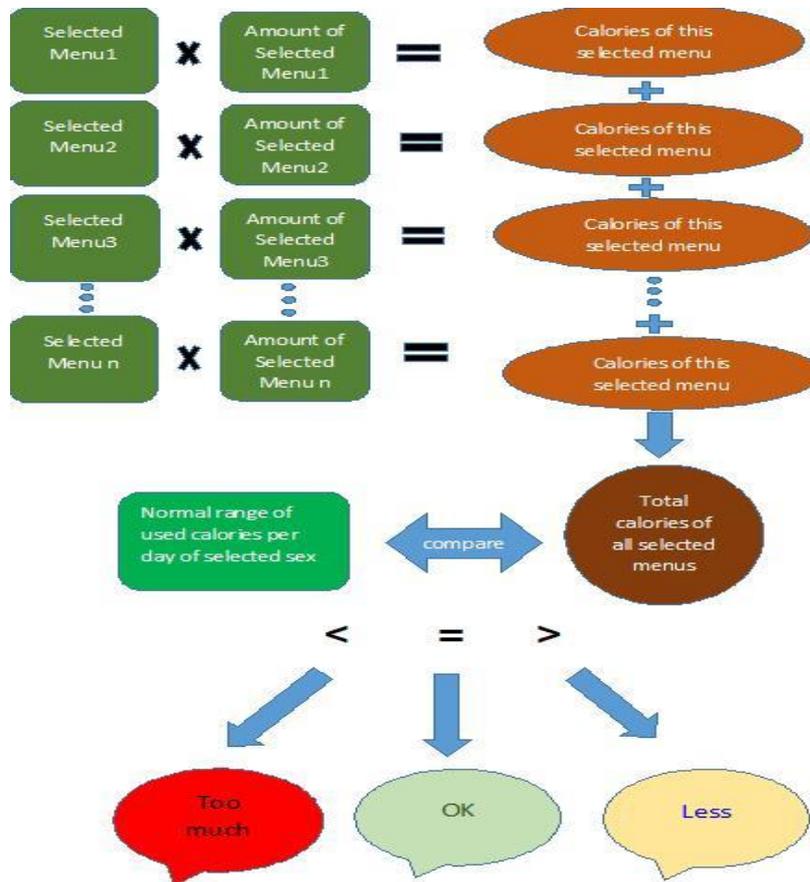
DSS User Interface Development

Google Sheets was used as a tool for DSS development.

Users could select menus and the amount as much as they wanted, and selected the sex of the user. Then DSS would calculate total calories of all the menus selected and compare with the normal range of calories and showed the results. The language used in this DSS was mainly in Thai.



Figure 1.
DSS model



RESULTS

The first user interface DSS developed was shown in Figure 2. The first row showed the reference where the calories of all menus taken from. The 3rd and 4th rows were the instruction of how to use this DSS. The first five columns were 657 food menus which users could choose by selecting the checkbox in the first column at the front of the menu and the number of food unit by selecting from drop-down list box in the fourth column on the same row. Then the system calculated the calories of the selected menu which showed in the same row in the fifth column as well as summarized all the calories of all the selected menu(s), and showed the results in the seventh column in the 8th row. Then user put in his/her sex by selecting the checkbox in the 13rd or 14th row. After that, DSS compared the total calories calculated from all selected menus with the normal range of calories used in a day of the selected sex and showed the results in column I. User could explore by changing the selected menu(s) and the amount of each selected menu and saw the results from comparing with the normal range of calories used per day. The results from the system had three types which were less, ok, and too much. After the user saw the results from DSS, user could decide to change the selected menu(s) and/or the amount of each menu and saw the results again and again until they could make decision on the menus and the amount of the selected menu(s) to have per day.



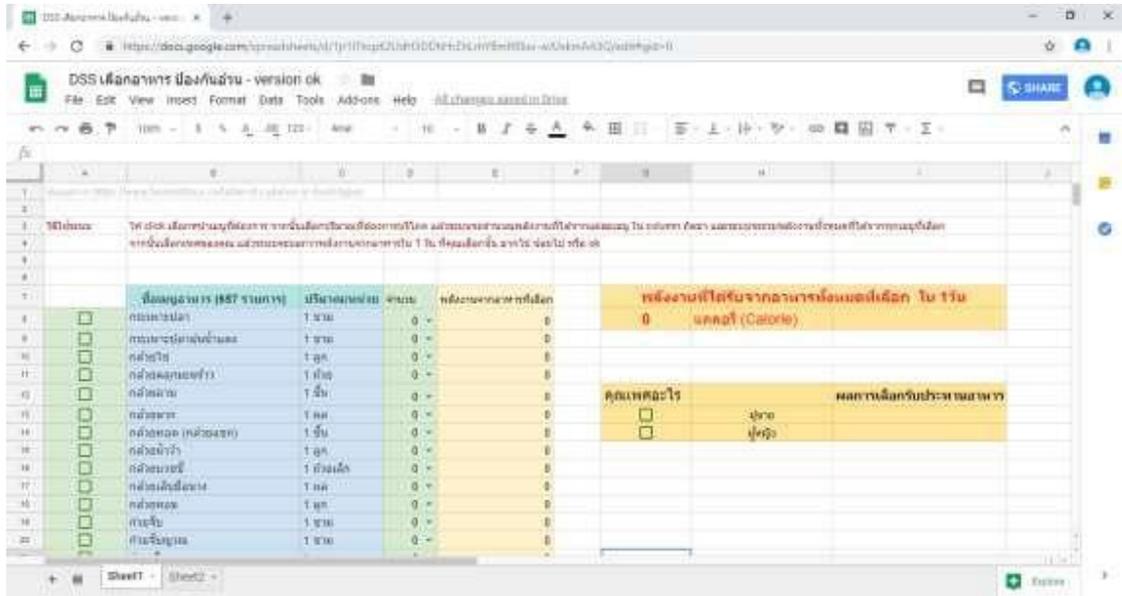
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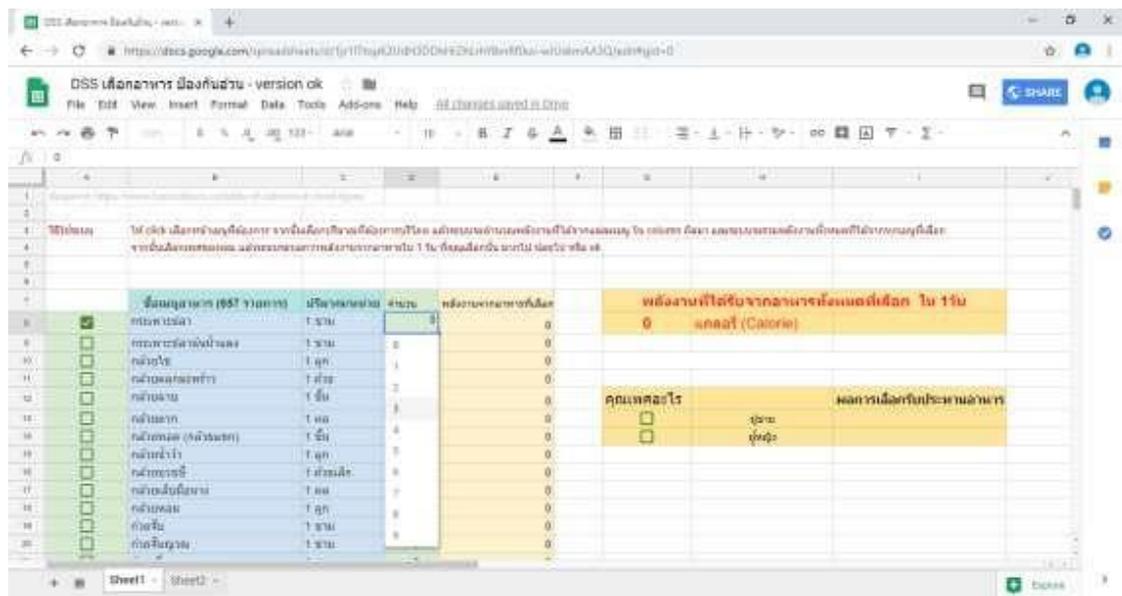


Figure 2.
DSS for Avoiding Obesity at the First Glance



User could select the menu and the amount of the selected menu that they wanted to have from drop-down list box as shown in Figure 3.

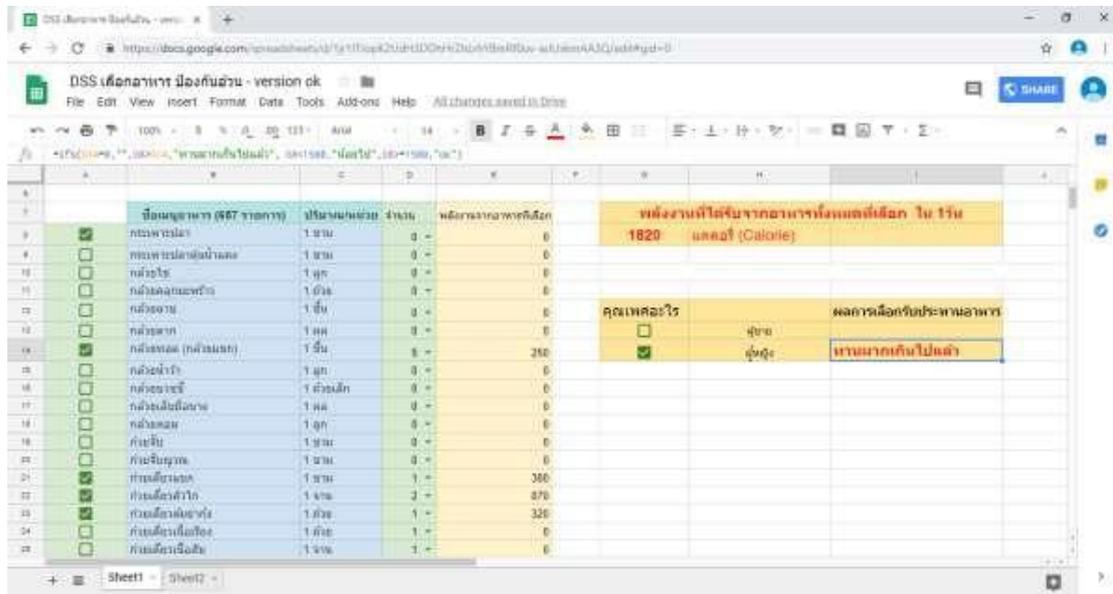
Figure 3.
Menus and the Amount Selection



Then DSS calculated total calories of all menus selected and showed the results. Then the user selected his/her sex in the system as shown in Figure 4.



Figure 6.
In case “too much”



After finishing DSS development, we created a link on a website and then asked the users to test this DSS and evaluated this system.

This DSS was evaluated in two facets which were user friendliness and usefulness with five-level Likert items (1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree) participated by 78 responses on online questionnaire. The results in user friendliness were shown in Table 1.

Table 1.
Evaluation Results of User Friendliness

Level	frequency	%
1 = Strongly disagree	1	1.3
2 = Disagree	2	2.6
3 = Neutral	7	9
4 = Agree	20	25.6
5 = Strongly agree	48	61.5

The result of average users on friendliness level was 4.44.

The results from evaluation in user friendliness plotted in graph were shown in Figure 8. The result in usefulness was shown in Table 2. Average value of usefulness level was 4.60. The results from evaluation in usefulness plotted in graph as shown in Figure 9.

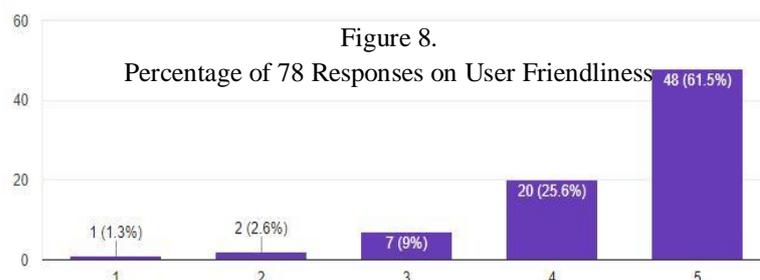
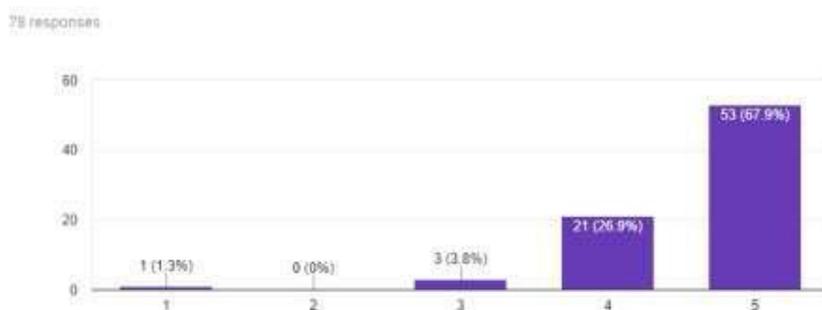




Table 2.
Evaluation Results of Usefulness

level	frequency	%
1 = Strongly disagree	1	1.3
2 = Disagree	0	0
3 = Neutral	3	3.8
4 = Agree	21	26.9
5 = Strongly agree	53	67.9

Figure 9.
Percentage of 78 responses on usefulness



CONCLUSION

The results from evaluation of this DSS participated by 78 responses were user friendliness (average = 4.44) and usefulness (average = 4.60) with five-level Likert scale. The developed DSS of this research was found useful and friendly very much. Using this DSS by users could explore the menus that they should have per day to avoid the obesity. As there were 657 menus in this DSS, the user could select plenty of menus as many as they wanted since it had many food choices to decide to have.

ACKNOWLEDGEMENTS

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The Analysis of Water Quality for Water Supply System in Bannongvang village, Namon District, Kalasin, Thailand

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ABSTRACT

In the past, surface water was used as a source of water supply in Bannongvang village, Namon district, Kalasin province, Thailand. It was known that the surface water had been polluted by domestic and agriculture activities causing the water quality unusable as water supply. Therefore, groundwater has been the only one source of water supply in the village since 2015. The study area covered an area of 160 km² and lies in a semiarid region. There were about 800 people living in this area. Agriculture was the major activity in this area. The aim of this study was to analyze the water quality of groundwater supply for the village. In order to assess the water supply quality, water supply samples were collected from eight taps in different places around the village during September 2018. The water samples were analyzed for physical and chemical characteristics, such as pH, Total Dissolved Solids (TDS), as well as trace amount of metal concentration (Fe, Mn and Zn) in the laboratory using the standard methods given by the American Public Health Association (2005). The results were evaluated in accordance with the drinking water quality standards suggested by the World Health Organization and the Thai standard of water supply. The results showed the water supply quality of Bannongvang village and the need for the preliminary treatment of water before it was used for the household purpose.

Keywords: *Drinking water, Groundwater, Water quality, Water supply*

INTRODUCTION

Water is necessary for human and animal life. The selecting of water source is important for quality and quantity of water supply to meet water requirement. Groundwater is the majority source of water supply for domestic, agricultural, and industrial sectors in many countries. In Thailand, groundwater has been also promoted as one of the purest forms of water available for supplying to meet the overall demand of people in rural and semi-urban areas. In the past, surface water was preferred as a source of water supply in rural area because of its convenient availability and its constant and good quality. However, rural water supply system has a critical issue in water quality because the source is contaminated by domestic and agriculture activities. Agriculture seems to be the most considerable source of pollution due to runoff from fertilized land. Therefore, people believed that groundwater was purer and safer than surface water due to the protective qualities of the soil cover. Groundwater source was used also for solving an inadequate water supply, and safe water in many rural areas in Thailand. Normally, groundwater naturally contains higher iron and manganese than surface water. High concentration of these metals can cause an undesirable taste and color. The traditional way, aeration is widely used in order to remove iron and manganese from groundwater. Aeration process removes dissolved metals through oxidation which were the chemical combination of oxygen from the air with dissolved metals such as



iron, manganese, and volatiles organic in the water. Once oxidized, these chemicals become particles in the water and can be removed by filtration. The efficiency of aeration relies on the area of surface contact between air and water.

The water supply quality is very important factor since it indicates the quality of people life in rural area. Groundwater quality relies on the quality of infiltrated water, precipitation, surface water and sub-surface geochemical processes (Jafar, Loganathan, & Ananthkrishnan, 2013). The groundwater quality therefore is important to consider the suitability of water for different purposes. Changes in local topography and water discharge from activities directly affect both quality and quantity of the groundwater (Vasanthavigar, Srinivasamoorthy, Gandhi, Chidambaram, & Vasudevan, 2010). Heavy metals are one of the main environmental problem occurred in water from natural, such as chemical weathering of minerals and soil leaching, or anthropogenic sources (Biswas, Uddin, Alam, Sakib, Sultana, & Ahmed, 2017). The groundwater contaminated by hazardous or heavy metals is a serious worldwide problem because these metals are permanent and most of them have toxic effects on living organisms for the human consumption when they exceed the permissible limit (Chakraborty, Zaman, Mukhopadhyay, Banerjee, & Mitra, 2009; Sirajudeen, Manikandan, Manivel, 2014). Thus, heavy metals contamination in groundwater used for human purpose is very significance from the human health viewpoint. The physical and chemical characteristics of groundwater play an important role in classifying and assessing water quality. Several researchers have been studied heavy metals pollution of the groundwater according to human activities (Jafar, Loganathan, & Ananthkrishnan, 2013; Chakraborty et al., 2009; Balakrishnan & Ramu, 2016). In recent years, attention has been given to study of the evaluation of natural concentration of heavy metals in groundwater. The objective of this study was to investigate the water quality of water supply of Bannongvang village and to delineate regions where groundwater source was suitable or unsuitable for drinking and household purpose.

Study area

The study area was in the rural water supply system of the Bannongvang village in Namon district, Kalasin, Thailand. This region locates in northeastern Thailand. It covers an area of 160 km² and lies between latitudes of 103°46'46.3"N to 103°46'59.5"N and longitudes of 16°39'6.16"E to 16°39'1.7"E. This area has a semiarid climatic type with temperature ranging from 19°C to 45°C. The water supply system covers around 800 users. The region covers both agricultural land and residence area. Agriculture is the major activities and chief crops grown are paddy and watermelon, etc. In the past, surface water source had been used for the water supply system of this area. However, the surface water was polluted by agriculture and household drainage. The poor water quality then affected to the people, then this source was stopped using for water supply. Therefore, groundwater has been used as the major source for water supply of this village. The water from groundwater is pumped to the top of the towel and allowed to cascade down through the rising air through natural draft aeration to oxidize iron and manganese before filtration. The treated water is stored in the high tank before distributing to users.



Figure 1. Location of Namon District, Kalasin Thailand. (Google map)

Material and Method

The collection of 24 samples was carried out directly from tap water of different eight sampling stations for assessment of water supply quality during the post monsoon season (September 2018). Three samples were collected at each sampling station. The eight sampling stations were shown in Figure 2. The 1st station was at the pumping station where the samples were collected at the entry point of the supply water to the users’ house. Other sampling stations were at the users’ house. The water samples were collected from the nearest water users of the distribution line in the village, middle and the farthest which represented the quality of the piped water. Water supply samples were collected in clean polyethylene bottles. At the time of collecting the samples, bottles were thoroughly rinsed 2-3 times with water at its source to be sampled. The water samples were collected after flushing water for about 2-3 minutes to remove the stagnant water as per standard procedures (American Public Health Association, 2014). The collected water samples were transported to the laboratory on the same day and preserved in a refrigerator at 4°C before analysis. Some physical parameters were tested namely pH, total hardness, total dissolved solids. Hydrogen ion concentration (pH) was measured on the site by using a digital pH meter while other parameters were determined in the laboratory within 48-72 hours of the sampling following the standard methods (American Public Health Association, 2014). The analysis was in accordance with standard methods of Water and Wastewater standards method (American Public Health Association, 2014) for various physico-chemical parameters. Total Dissolved Solids (TDS) was performed by gravimetric analysis. Total Hardness (TH) was analyzed by volumetric titration methods. Heavy metals, such as iron (Fe), manganese (Mn), and zinc (Zn) were also measured by using Atomic Absorption Spectrophotometer (AAS) (Model: PerkinElmer PinAAcle 900F Atomic Absorption Spectrometer). All the Chemical analysis of water samples were performed in the Laboratory of the faculty of science and health technology at Kalasin University.



Figure 2. The Eight Sampling Stations at Bannongvang Village in Namon District, Kalasin, Thailand

RESULTS AND DISCUSSION

Quality of water supply from groundwater source determined its suitability for different purposes depending upon the specific standards. Generally, the chemical characteristic of water supply used for drinking should be soft, low in dissolved salts and free from toxic constituents. The drinking water standards of World Health Organization or WHO (2011) and Thailand Department of Health Standards or TDH (2009) were the basis for the water supply quality evaluation for drinking purpose. General characteristics of physicochemical parameters and concentration of heavy metals in water samples for the study area were summarized in Table 1. All the samples (n = 24) showed the pH values varies between 7.25 and 8.19, with an average of 7.97, which indicated the alkaline nature of water supply of the study area. The pH and TDS value of all the water samples are within the permissible limit prescribed for drinking water by WHO (2011) and TDH (2009). The total dissolved solid test measures the total amount of dissolved minerals in water reported that TDS ranged from 100 mg/L to 350 mg/L, with an average of 210. The solid could be iron, manganese, calcium, or other minerals could produce unpleasant taste as well as effect corrosion in water distribution network. High TDS level caused in excessive staining of water pipes and household appliances, and could shorten the service life of these appliances (Jafar, Loganathan, & Ananthakrishnan, 2013). Hardness was an important factor for household purposes because pipes could become clogged with scale. The hardness in water was caused by sedimentary rocks and seepage and runoff from soils (Akram, & Rehman, 2018). The results of TH showed that the water sampling station at house 1, 2, 3 and 6 within the permissible limit of WHO standard as in Figure 4. However TH of all water sampling stations was within the permissible limit of Thailand Department of Health Standards (TDH). However, water



with hardness above 200 mg/L might cause scale deposition in the water distribution system and increase soap consumption (Beyene, H. D. 2015). Iron and manganese were one of the most abundant metals in Earth's crust, usually occurred together (World Health Organization, 2011). The collected samples showed that the concentration of iron, manganese and zinc varies from 0.119 mg/L to 0.371 mg/L, 0.241 mg/L to 1.039 mg/L and 0.119 mg/L to 0.689 mg/L respectively. The mean concentration of heavy metals was followed the descending order: Mn>Zn>Fe. The iron concentration of all the stations was within permissible limit except House1 which the mean concentration of iron was higher than the standard of WHO (2011). High iron concentration may stain plumbing fixtures and clothes, and produce undesirable tastes as well as an objectionable reddish-brown color to water. All the samples show high concentration of manganese except House4 and House7 as seen in Figure3. Manganese occurred naturally in many surface water, groundwater and food sources. Although, manganese was an essential element for humans and animals, excess Mn concentration might cause neurotoxicity as experimentally shown, and in neonates given parenteral nutrition (Erikson, Thompson, Aschner, Aschner, 2007; Agency for Toxic Substances and Disease Registry, 2012). The concentration of zinc in surface and ground waters was normally below 10 µg/L and 10–40 µg/L, respectively (Elinder, 1986). However, the zinc concentration in tap water might be higher because of the zinc leaching from piping and fittings (Nriagu, 1980). The concentration of zinc of the collected samples was within the permission limit. Low concentration of zinc in water left an undesirable astringent taste and opalescent color as well as a greasy film on boiling.

Table 1. Physicochemical Parameters

Sample No.	Sampling location	pH	TDS (mg/L)	TH (mg/L)	Fe (mg/L)	Mn (mg/L)	Zn (mg/L)
1	Initial supply	8.10	210	361	0.245	0.326	0.237
2	Initial supply	8.15	200	400	0.289	0.353	0.293
3	Initial supply	8.13	160	275	0.326	0.323	0.368
4	House 1	7.93	200	320	0.371	0.366	0.553
5	House 1	7.98	240	308	0.347	0.359	0.689
6	House 1	7.97	240	254	0.263	0.302	0.147
7	House 2	7.99	220	242	0.171	0.395	0.125
8	House 2	8.01	230	243	0.119	0.392	0.126
9	House 2	8.05	210	231	0.188	0.390	0.135
10	House 3	7.96	190	254	0.119	0.337	0.119
11	House 3	7.91	260	279	0.253	0.481	0.128
12	House 3	7.94	230	240	0.256	0.485	0.149
13	House 4	7.99	200	386	0.263	0.262	0.227
14	House 4	8.11	350	314	0.267	0.241	0.231
15	House 4	7.75	100	310	0.266	0.308	0.235
16	House 5	8.14	250	367	0.224	1.039	0.189
17	House 5	7.99	290	322	0.210	0.265	0.224
18	House 5	8.15	330	372	0.331	0.276	0.240
19	House 6	7.86	110	234	0.162	0.325	0.275
20	House 6	7.25	160	326	0.135	0.334	0.270



21	House 6	7.54	130	254	0.266	0.345	0.273
22	House 7	8.00	150	382	0.306	0.265	0.265
23	House 7	8.13	320	322	0.156	0.297	0.2911
24	House 7	8.19	190	295	0.286	0.289	0.269
Average		7.97	215	304	0.242	0.365	0.252
WHO (2011) permissible limits		6.5-8.5	600	300	0.3	0.3	3.0
TDH (2009) permissible limits		7.0-8.5	600	500	0.5	0.3	5.0

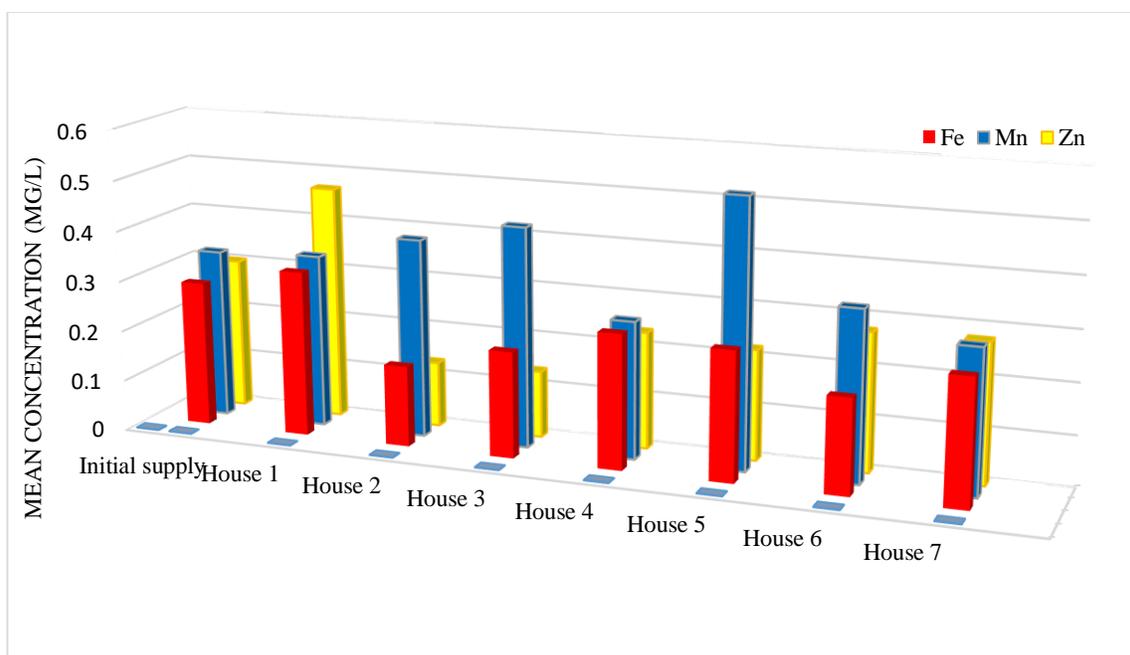


Figure 3: The Mean Concentration of Metals of Sampling Stations.

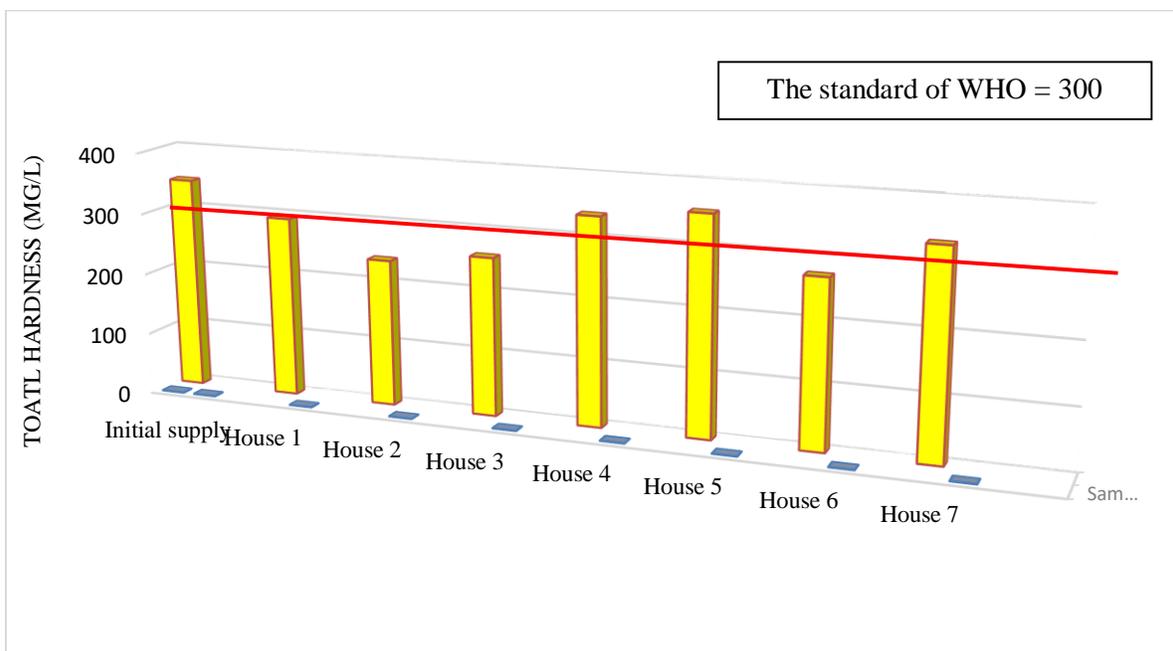


Figure 4: The Total Hardness of Sampling Stations.

CONCLUSION AND FUTURE WORK

Rural water supply system in Bannongvang was sometimes not satisfactory because its color was unpleasant. Water supply using groundwater as a source was generally alkaline, hard and brackish. However, pH and TDS were within the permission limit for drinking and domestic purposes. The concentration of trace elements, such as iron and zinc were within the permission limit for drinking except for a few stations. On the other hand, high manganese concentration at a number of sampling stations clearly indicated the unsuitable of water supply for drinking and domestic purposes. Few stations of the sampling station in the village fall in the suitable range for drinking purpose and most stations were unsuitable for drinking and domestic purpose. According to the overall assessment of the water supply quality was found suitable for drinking purposes, in 25% of the stations sampled. The values of concentration of trace elements indicated high abundant metal, such as iron and manganese in this area. These minerals were commonly found in soil and rock and could dissolve into groundwater as it percolated through soil and rock. High manganese concentration might cause neurotoxicity and health risk to the rural people due to drink these contaminated. Therefore, this area needed adequate preliminary treatment to overcome high manganese concentration problem for drinking and domestic purposes. The water contained both iron and manganese, staining that could vary from dark brown to black. Therefore, this was sometimes the cause of consumer complaints about the red or dirty water. However, this village had used a natural draft aeration to remove abundant metals contained in groundwater. The frequency of maintenance of the preliminary treatment is important to maintain the efficiency of the aeration and filtration system. Government therefore, should take necessary steps and control for mitigating the risk of supply water contamination. However, other heavy metals polluted by agricultural activities, such as arsenic, cadmium, and leads were not analyzed in this study. Other important parameters indicated that



microbiological quality analysis and heavy metals should be analyzed for drinking purposes to represent the quality of the water supply of this village in the future works.

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Waste Separation Behavior

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ABSTRACT

Nowadays, waste management is a big problem needed to deal with. The 3R (Reduce, Reuse, and Recycle) has been promoted in waste management. Waste separation behavior is an essential factor effecting on waste reduction and good to reuse, reform and recycle. This research is a preliminary study on waste separation behavior of undergraduate students in Suan Sunandha Rajabhat University, Bangkok, Thailand. This study focused on waste separation behavior of the responses, the responses’ knowledge in waste separation, and the responses’ attitude towards waste separation by using online questionnaire with Yes/No answer choices. The results of the study showed that 68% of the responses did waste separation, 93% of the responses knew how to separate the waste, and 96% of the responses had positive attitude towards waste separation.

Keywords: Behavior, Separation, Waste

INTRODUCTION

There are many researches investigating on the factors related to waste separation behavior as seen in references (Tonglet, Philips, & Read, 2004; Pothimamaka, 2008; Ittiravivongs, 2011; Ghani, Rusli, Biak, & Idris, 2013; Bernstad, 2014; Nguyen, Zhu, & Le, 2015; Sheau-Ting, Sin-Yee, & Weng-Wai, 2016). The related factors can be different among societies, personnel attitudes, and society norms. As seen in many places and many events, there were sharing the knowledge how to separate the waste, so we believe that nowadays almost all the people in the society has already known how to do waste separation. Still, the waste is the big problem needed to be managed. As seen on TV that there were fire from garbage pilethreatening many households. There were much pollution, such as air pollution, water pollution, and soil pollution in the societies. These events showed that the waste has still been misplaced and miss conducted.

There were many research works on waste separation behavior. Stoeva and Alriksson (2017) found that a recycling program could function as a barrier for individuals to participate in waste separation at home, as well as satisfaction with local facilities could play an important role in engagement with separation of household waste. Zhang, Liu, Wen, and Chen (2017) found that parents and friends’ source separation behavior had positive correlation with students’ behavior. Additionally, knowledge had positive correlation with source separation behavior. Vassanadumrongdee and Kittipongvises (2018) stated that both subjective norms and knowledge on municipal solid waste situation had positive correlation with Bangkok residents’ source separation intention. Moreover, Xu, Ling, Lu, and Shen (2017) revealed that the intention to recycle had a significant effect on recycling behavior. Accordingly, market incentives, government incentives, and government facilitators had significant effects on recycling intention. Nguyen, Zhu, and Le (2015) found that trust, personal moral norms, perceived difficulties and reciprocity were important factors that explained the residents’ behavioral intentions in waste separation. (Bernstad, 2014) stated that the importance of convenience and existence of infrastructure were necessary for source-



segregation of waste as important factors for household waste recycling, and highlighted the need of addressing these aspects where waste was generated, such as when it was already inside the household.

Waste separation behavior could be depending on many factors. If one did not know how to separate the waste, one could not separate the waste. If one’s attitude was negative towards waste separation, one would not separate the waste. On the other hand, if one knew how to separate the waste and also had positive attitude towards waste separation, one would participate in waste separation which led to less waste problems in the society.

As seen in Sweden, all the waste has been brought to produce the energy and now the country does not have enough waste to be the source of energy and need to import the waste from the other nearby countries. This is the example showing that good waste management can not only reduce pollution from the waste but also get benefits from the waste. In Thailand, waste management is still mainly on municipal duties, and it need to have proper waste management. The amount of waste has been growing more and more every year since it has more population in the country, more consumers, and more sources of waste.

In this research we studied the students’ waste separation behavior, personnel attitude towards waste separation, and the knowledge about waste separation.

METHODOLOGY

An online questionnaire with *Yes* or *No* answer choices was created for data collecting from the undergraduate students in Suan Sunandha Rajabhat University, Bangkok, Thailand.

The three questions in the questionnaire were

1. Do you do waste separation? (This question referred to waste separation behavior)
2. Do you know how to separate the waste? (This question referred to knowledge on waste separation)
3. Do you have positive attitude towards waste separation? (This question referred to personal attitude towards waste separation)

RESULTS

There were 68 responses of the questionnaires.

Question 1: Do you do waste separation?

The results from the responses to question 1 were shown in Table 1, Figure 1, and Figure 2.

Table1.
Responses to Question 1

Q1	No of responses	Percentage
Yes	46	67.65
No	22	32.35

Figure 1.
Number of Responses to Question 1



Figure 2.
Proportion of Responses to Question 1



From Figure 2, there were 68 % of the responses who did waste separation. The result was found little bit more than half that respondents did waste separation.

Question 2: Do you know how to separate the waste?

The results from the responses to question 2 were shown in Table 2, Figure 3, and Figure 4.

Table2.
Responses to Question 2

Q2	No of responses	Percentage
Yes	63	90.65
No	5	7.35

Figure 3.
Number of Responses to Question 2

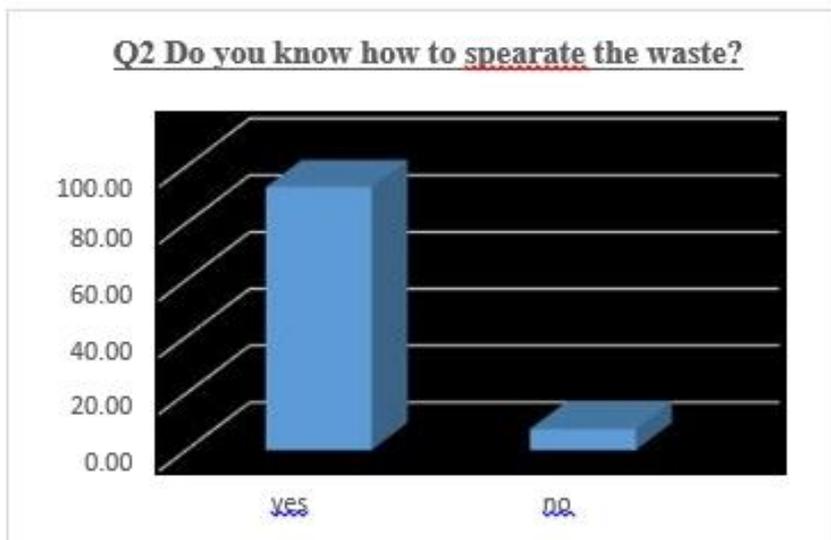
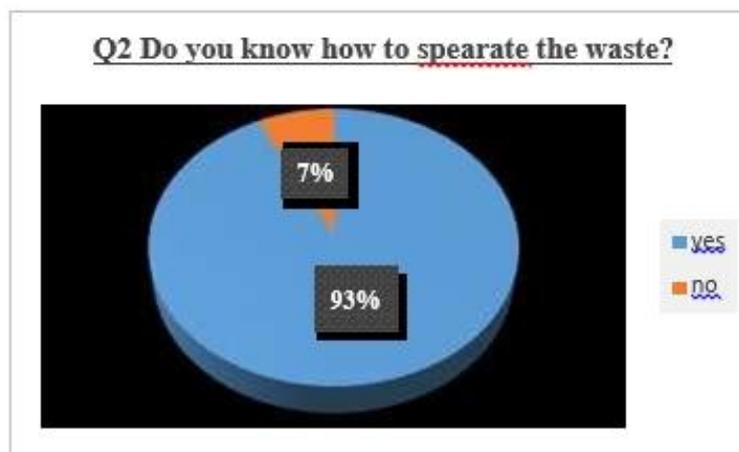


Figure 4. Proportion of Responses to Question 2



From Figure 4, there were 93% of the responses knowing how to separate the waste. It could be said that almost all respondents had knowledge of waste separation.

Question 3: Do you have positive attitude towards waste separation?

The results from the responses to question 3 were shown in Table 3, Figure 5, and Figure 6.

Table 3. Responses to Question 3

Q3	No of responses	Percentage
Yes	65	95.59
No	3	4.41



Figure 5.
Number of Responses to Question 3

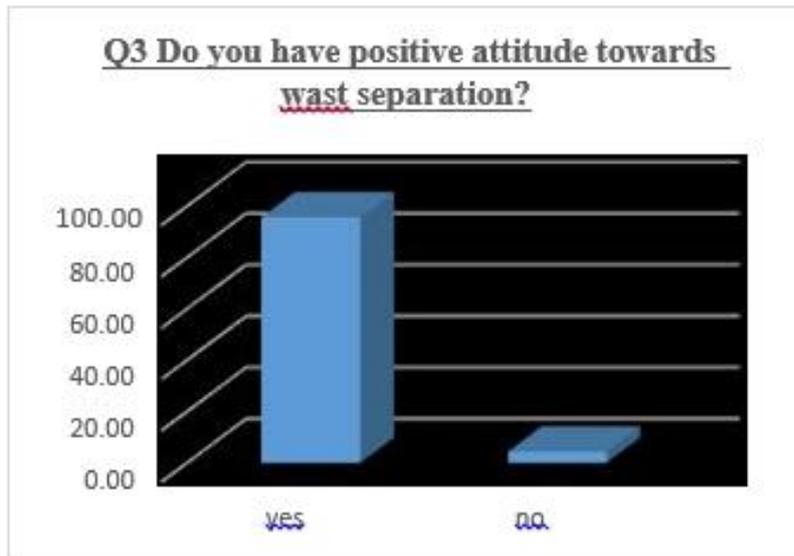


Figure 6.
Proportion of Responses to Question 3

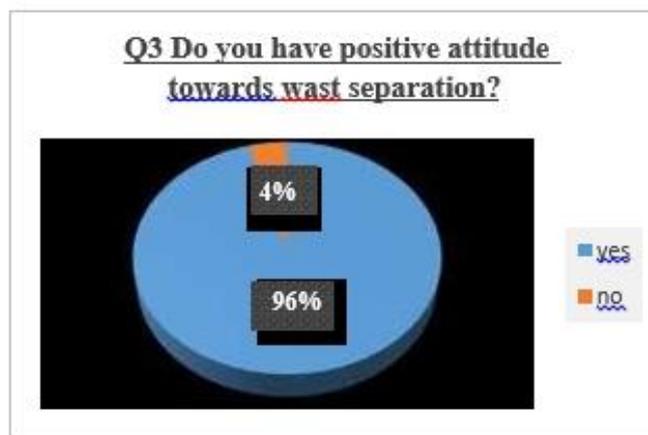


Figure 6 showed that 96% of the responses had positive attitude towards waste separation. This meant almost all respondents had positive attitude towards waste separation. It could be concluded that there were high percentage (93%) of having knowledge of waste separation and also very high percentage (96%) of having positive attitude towards waste separation while in waste separation behavior, it was found little bit low percentage (68%). This showed that waste separation behavior was not depending on only having the knowledge of waste separation and positive attitude towards waste separation, but also depending on the other factors.

There were some research studies about the students' behavior in waste separation. Sheau-Ting, Sin-Yee, and Weng-Wai (2016) found that the most important attribute to encourage waste separation on campus was to ensure that the community was able to access the recycling bins in a distance of 100-500 meters since limited access to recycling bins will restrict the waste separation behavior. Stoeva and



Alriksson (2017) revealed that a lack of proper conditions for waste separation could prevent individuals from participating in waste separation, regardless of their positive attitudes. Additionally, Zhang, Liu, Wen, and Chen (2017) stated that parents and friends’ source separation behavior has positive correlation with students’ separation behavior. Furthermore, Tangwanichagapong, Nitivattananon, Mohanty, and Visvanathan (2017) found that 3R waste management initiatives had positive effects on people’s attitudes about resources, waste management and consciousness of the need to avoid waste, but these initiatives did not affect recycling and waste management behavior. A voluntary approach only could not bring about behavioral change.

Figure 7.
Summarize the results of this study



CONCLUSION

The current research found that waste separation behavior was not related to the waste separation attitudes, and waste separation knowledge. The results of the study also showed that it was very high percentage in positive attitude towards waste separation and very high percentage in knowing how to do waste separation, but less in waste separation behavior. Additionally, there were different factors related to waste separation behavior of the people in different groups and different areas. Further study should focus on related factors to waste separation behavior of the people in the society. Moreover, special program should be creating to promote and support waste separation behavior from the related factors in the society.

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INQUIRY BASED SCIENCE EDUCATION AND RESPONSIBLE RESEARCH AND INNOVATION: REAL EXAMPLES FROM EUROPEAN UNION PROJECTS

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ABSTRACT

There is a close relationship between the competitiveness of the countries in scientific and technological fields and the qualified manpower trained in those countries. For that reason, European Union has been making major investments in the field of educational sector for the development of quality manpower in the fields of science and technology through both its framework programs (FP7 and H2020) and Erasmus plus program. In this context, initiatives such as “Inquiry Based Science Education (IBSE)” and “Responsible Research and Innovation (RRI)” have been realized in many EU supported projects to provide teachers and students necessary educational support and to give students opportunities to choose a career in science and technology. These approaches played an important role in changing the perspective of science education in Europe. In this study, the projects that are supported by European Union and their contributions to science education will be explained.

INTRODUCTION

The European Union (EU) offers financial supports to individuals in two major programs in the field of education: Framework Programs and the Erasmus Plus program.

The European Union's Framework Programs:

The framework programs are the financial support programme to implement the scientific and technological initiatives which aim to improve Europe's global competitiveness in the world. Decisions related to the framework programs are given by Europe's leaders and the Members of the European Parliament. The framework programs are seen as an EU's blueprint for smart, sustainable and inclusive growth and jobs. A total of seven framework programs have been carried out so far and have been completed successfully. The period of each framework program is 7-years. The latest framework programme, Horizon 2020, focusses on the excellent science, industrial leadership and tackling societal challenges. It is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available in the years between 2014 and 2020. Horizon 2020 framework program covers all people and the main aim is to remove barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation (Horizon 2020).

The programme covers all sectors: Agriculture and forestry, Aquatic Resources, Bio-based Industries, Biotechnology, Energy, Environment & Climate Action, Food & Healthy Diet, Funding Researchers, Health, ICT Research & Innovation, Innovation, International Cooperation, Key Enabling Technologies, Partnerships with Industry and Member States, Plastics, Raw Materials, Research Infrastructures, Security, SMEs, Social Sciences and Humanities, Society, Space and Transport.

Responsible Research and Innovation (RRI) is an important concept of the ‘Science with and for Society’ objective. RRI is defined at Horizon 2020 as “Responsible research and innovation is an approach that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation” (Horizon 2020).

Further information can be found on the European Commission Funding programmes, particularly Horizon 2020 at <https://ec.europa.eu/programmes/horizon2020/en>.

The European Union's Erasmus+ programme

Erasmus plus programme is another funding programme of European Union to help and support quality activities in the fields of Education, Training, Youth and Sport. The programme is carried out by National Agencies and partly at the European level by the Education, Culture and Audiovisual Executive Agency (EACEA).

The programme covers Key Actions which consist of mobility, cooperation and policy issues. According to the Erasmus plus programme; it offers opportunities for:



- individuals to spend a mobility or volunteering period abroad and to receive linguistic training,
- organisations to collaborate in project partnerships in the fields of academic and vocational training, schools, adult learning and European sport events (Erasmus Plus, 2018).

As it indicated above, the Erasmus + programme includes 3 key actions:

Key Action 1 supports mobility in the education, training and youth sectors and aims to bring long lasting benefits to the participants and the organisations involved.

Key Action 2 make it possible for organisations from different participating countries to work together, to develop, share and transfer best practices and innovative approaches in the fields of education, training and youth.

Key Action 3 provides grants for a wide variety of actions aimed at stimulating innovative policy development, policy dialogue and implementation, and the exchange of knowledge in the fields of education, training and youth. The majority of them are managed by the EACEA (Erasmus Plus, 2018).

Further information can be found on the European Commission’s Erasmus + programme at https://eacea.ec.europa.eu/erasmus-plus_en.

Examples of the EU Supported Framework Programme Projects:

Many framework program and Erasmus + projects were supported by European Union to realize the goals defined by European Commission. The projects (related to science education) explained below are just few examples funded by European Union. More projects can be found at Horizon 2020 and Erasmus + web pages.

The name of the project : Professional Reflection-Oriented Focus on Inquiry-based Learning and Education through Science (PROFILES)

Web address : <http://www.profiles-project.eu/>

The aim : The main aim of the PROFILES project is to create innovative learning environments and programmes for the enhancement of teachers’ continuous professional development in order to disseminate Inquiry-Based Science Education (IBSE) in more effective ways in science teaching and learning supported by stakeholders from different areas of society.

Contribution to the science education : PROFILES type teaching and learning modules for teachers and students, Continuous Professional Development Models for Teachers, Stakeholders Contribution to Science Education

The name of the project : ARK OF INQUIRY

Web address : <http://www.arkofinquiry.eu/>

The aim : The Ark of Inquiry project centres around two closely related concepts: Responsible Research and Innovation (RRI) and Inquiry-Based Science Education (IBSE). Ark of Inquiry aims at raising youth awareness to Responsible Research and Innovation (RRI), as well as building a scientifically literate and responsible society through Inquiry-Based Science Education (IBSE).

Contribution to the science education : Pedagogical framework for identifying inquiry-based activities that promote pupils' awareness of Responsible Research and Innovation (RRI); RRI-related inquiry-based activities; Making the inquiry-based activities available across Europe through the Ark of Inquiry platform

The name of the project : brEaking New Ground In the SciencE Education Realm (ENGINEER)

Web address : <http://www.engineer-project.eu/>

The aim : The main aim of the project is to introduce engineering into primary school and museum programmes throughout Europe and inspire the next generation of innovators and problem-solvers.

Contribution to the science education : Engineering modules for schools and museums.



The name of the project : Open Schools For Open Societies
Web address : <https://www.openschools.eu/>
The aim : The Open Schools for Open Societies project (OSOS) provide innovative ways to explore the world: not simply to automate processes but to inspire, to engage, and to connect. It supports the development of innovative and creative projects and other educational activities.
Contribution to the science education : Open schooling values and principles for action around curriculum, pedagogy and assessment, Offering guidelines and advice on issues such as staff development, redesigning time and partnerships with relevant organisations (local industries, research organisations, parents associations and policy makers), Suggesting a range of possible implementation models from small-scale prototypes through to setting up an “open school within a school” or even designing a new school.

The EU Supported Erasmus + Projects:

The name of the project : Development of Learning Design Skills for Enhancing Students' Key Competencies (LD-Skills)
Web address : <http://ea.gr/ep/ld-skills/>
Main aim : The main aim of the project is to capture a variety of pedagogical models for facilitating the process of strengthening students’ key competencies
Contribution to the science education: New approaches to teaching and learning, training framework for teachers, community of practice

The name of the project : Schools Study Earthquakes
Web address : <http://sse-project.eu>
The aim : The main aim of the project is to build a network of schools that study real data, do real analysis of real situations and real earthquake phenomena in real time using Inquiry Based Science Education in teaching and learning environments
Contribution to the science education: Real time earthquakes data collected from Eastern Mediterranean countries, Inquiry Based Teaching and Learning Activities for earthquakes, Seismology Handbook for teachers.

The name of the project : Daylighting Rivers
Web address : not ready
The aim : The main aim of the project is to raise students’ interest toward science, scientific competence and knowledge through the use of an effective Inquiry Based Learning approach applied to real and familiar context of Daylighting Rivers.
Contribution to the science education: Inquiry Based teaching and learning modules on rivers and ecosystems, Location Based Games.

Conclusions

The European Union provides serious financial supports to all stakeholders working in the field of science and technology through the framework and Erasmus + programs to develop innovative ideas, products and systems. Through these projects realized with the participation of quality brainpowers from different countries, the European Union is trying to increase the competitiveness of science and technology fields in the world. The European Union is developing and updating its support programs and taking measures to spend more budgets on science and technology. According to the Lammy Report published by the European Union, in the following years, special attention will be paid to the following actions:

- *Educate for the future and invest in people who will make the change: **Action:** modernise, reward and resource the education and training of people for a creative and innovative Europe.*
- *Make international R&I cooperation a trademark of EU research and innovation **Action:** open up the R&I programme to association by the best and participation by all, based on reciprocal co-funding or access to co-funding in the partner country*
- *Capture and better communicate impact **Action:** brand EU research and innovation and ensure wide communication of its results and impacts (Lammy, 2017).*



The 80th Anniversary of Suan Sunandha Rajabhat University

“International Conference on Innovation, Smart Culture and Well-Being” (ICISW2018)

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In order to implement these action plans, we need to start with science and technology teaching and learning environments and need to use new and active educational approaches. These actions will ofcourse improve our students’ imagination, invention and creation skills that will be needed for responsible research and innovation. As a final remark, we need to work together to create a better world for future open societies.

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The Efficiency of Interactive Science Simulations-Based Physics Teaching

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ABSTRACT

This research aimed to examine the achievement of interactive science simulations-based physics learning and the efficiency of interactive science simulations-based physics teaching. The authors had designed the interactive science simulations-based self-learning, which lasted for 180 minutes per week and was divided into 150-minute theoretical teaching, and 30-minute interactive science simulations-based self-learning demonstrations via <https://phet.colorado.edu> and at-home interactive science simulations-based self-learning. Meanwhile, the normal teaching involved 180-minute theoretical teaching and laboratory-based demonstrations as well as topical homework. The teaching duration was 1 semester. The package software was used in the assessment, analysis and processing of mid- and post-learning achievement to identify statistical values: number, percentage, mean, standard deviation, t-test, and analysis of variance at .05 level of statistical significance ($P = .05$).

According to research results, the physics knowledge based on midterm and final scores of students in the group of interactive science simulations-based physics teaching and of normal teaching indicated a similar learning achievement. Respecting physics learning achievement of Suan Sunandha Rajabhat University students attending the former, their midterm scores were higher than the final ones at .05 level of statistical significance. Moreover, the efficiency of interactive science simulations-based physics lessons is higher than those used in normal teaching. In this regard, the efficiency values ($E1/E2$) were equivalent to 92.38/82.74 and 89.62/75.83, respectively.

Keywords: *Self-learning, Interactive Science Simulations*

INTRODUCTION

The education is a tool/mechanism in developing human resource into citizenship (Ministry of Education, 2016). This includes 1) desired habit/ behavioral characteristics that require lifelong adherence (e.g. healthcare for age-appropriate growth, learning behavior creation, possession of desired competence, public consciousness, active citizen in doing public good and citizenship values), 2) possession of important body of 21st century knowledge: this fundamental knowledge is crucial for the inclusive and happy life based on the sufficiency economy philosophy within free and borderless economic and social systems, 3) the 21st century skills refer to learning skills that also require lifelong adherence from school to work age including skills, knowledge, ability and curriculum standards-based competence. All these are basic literacy based on the level and type of education, and 4) life skill possession: this skill is potentials, ability and competence sufficient for happy life enjoyment in society. It comprises learning skill, knowledge sharing and social skill, imagination skill, work skill and career progress, patent creation skill as well as self-creation skills of job and occupation.



The in-class learning, curricular and extra-curricular activities, university year experiences and interactions with lecturers and classmates lead to students’ learning outcome development. According to Ong-Art Naiyapatana (2015), 9 principles for good learner assessment not only were the value, creativity and reflection of multi-dimensional and interconnected learning but also revealed results in one given period. Clear objectives were determined with emphasis on learning outcomes along with the ongoing experience towards learning outcomes. The representatives from various sectors in educational community involved in considering the implementation of result assessment. This was one of conditions for learning quality improvement, while the assessment had to reflect the educational administrators’ responsibility towards students and publics.

The instruction focusing on learners’ role and participation (Piratch Duangkhamwad, 2018) was the integration of hierarchical teaching methods and techniques with Benjamin Bloom’s learning theories. The systematic teaching preparation was divided into following periods: teaching preparation or input, teaching and learning or processing process as well as assessment or action on results. This teaching method was called the Active Learning Model. The participatory learning promotes in-class participation and learner-teacher interactions focused on learning process development, and encouraged learners to apply skills and integrate body of knowledge in problem solving or future works. This instructional approach also enabled them to acquire 21st century life skills and characteristics in response to changes in today’s world. Good education for student quality promotion in the new era needs total change of students’ learning pattern. This meant that teachers should change the role to learning facilitators and learn about skills to perform such role systematically.

Physics is long accumulated/acquired knowledge and comprehension (the Institute for the Promotion of Teaching Science and Technology, 2003) and seeks knowledge to explain natural phenomena. All studied issues were found to be interrelated. Good learning required the understanding of principles of one given topic to the level that learners could apply them. This level of understanding enabled learners to explain, compare, categorize, give example, draw diagrams, choose and identify a range of topics.

Due to present changes, all parties are aware that, for the sake of country advancement, human quality development is needed. The development and problem-solving guidelines have been specified in National Economic and Social Development Plans in the context of change, especially reforming of science, technology and innovation. The education is an important foundation in enhancing personnel’s potentials for acquiring Thai’s desired characteristics as national and world citizen and in strengthening the way of learning and learning source. Higher education institutions are the important social organization for human development because the society is directed by graduates’ quality. The university’s main mission is the education, which is under multi-dimensional pressure of economy, society and politics. Therefore, the instructional arrangement in conformity with identity and mission is important. Suan Sunandha Rajabhat University, as a higher institution, dedicated for producing personnel to enhance the society’s quality, especially its scientific and technological aspects. Physics learning was difficult and complicated because the nature of its contents could not be perceived via 5 senses of students so the clear model and media were required. The interactive stimulations were created to explain different phenomena and invisible experiments in physics. With easiness to learn, the interactive science simulations promoted the students’ engagement in self-learning and in-class instruction and higher learning achievement. The authors were thus interested in experimenting whether the implementation of interactive science simulations in self-learning would promote better understating of physics. This research would benefit lecturers and students learning science, technology and physics for further instructional development.



Research Objectives

1. To investigate the achievement of interactive science simulations-based physics learning
2. To investigate the efficiency of interactive science simulations-based physics teaching

Research Hypothesis

The efficiency of interactive science simulations-based physics teaching was higher than normal physics teaching.

RESEARCH METHODOLOGY

1. There were 4 research processes including analysis, design and development, implementation and assessment. The sample was 2 groups of students of the Faculty of Science and Technology who enrolled in General Physics, 2nd Semester of the academic year 2017. The interactive science simulations-based self-learning was designed with duration of 180 minutes per week and divided into 3 parts which were 150-minute theoretical teaching, 30-minute interactive science simulations-based self-learning demonstrations via <https://phet.colorado.edu>, and at-home interactive science simulations-based self-learning. Meanwhile, the normal physics teaching consisted of 180-minute theoretical teaching and laboratory-based demonstrations as well as topical homework were applied to normal class. The teaching duration lasted for one semester.

2. The following factors were used in this research:

- 2.1 Learning groups: interactive science simulations-based self-learning and normal class
- 2.2 Mid- and post-learning achievement

3. The Fundamental Physics II Achievement Assessment Form was the research tool used in formative and summative assessment of achievement.

4. The authors used package software in the statistical analysis of Fundamental Physics II Achievement Assessment Form, which was applied in formative and summative assessment of achievement. The processes were as follows:

4.1 Descriptive Statistics Analysis

- 4.1.1 Lowest and highest values, mean and standard deviation to reflect mid- and post-learning achievement
- 4.1.2 Frequency table and expression of percentage to reflect the group of interactive science simulations-based physics teaching and of normal physics learning

4.2 Inferential statistics analysis using independence t-test

- 4.2.1 To compare Suan Sunandha Rajabhat University students' learning achievement in physics, categorized according to the teaching approach
- 4.2.2 To compare Suan Sunandha Rajabhat University students' mid- and post-learning achievement in physics

4.3 The efficiency of the interactive science simulations-based teaching and the normal teaching in Basic Physics is analyzed after being implemented. This is to improve the completeness of instructional approach by taking into account the standard value of 80/80 with following details.

- 4.3.1 Mid- and post-learning achievement is assessed using mean and standard deviation.
- 4.3.2 The mean of formative and summative assessment of achievement is calculated into percentage to identify the efficiency of standard criteria.
- 4.3.3 Mid- and post-learning achievement record table was created.



4.3.4 The achievement was examined according to the standard criteria of 80/80, while the efficiency values were determined as the process efficiency/result efficiency.

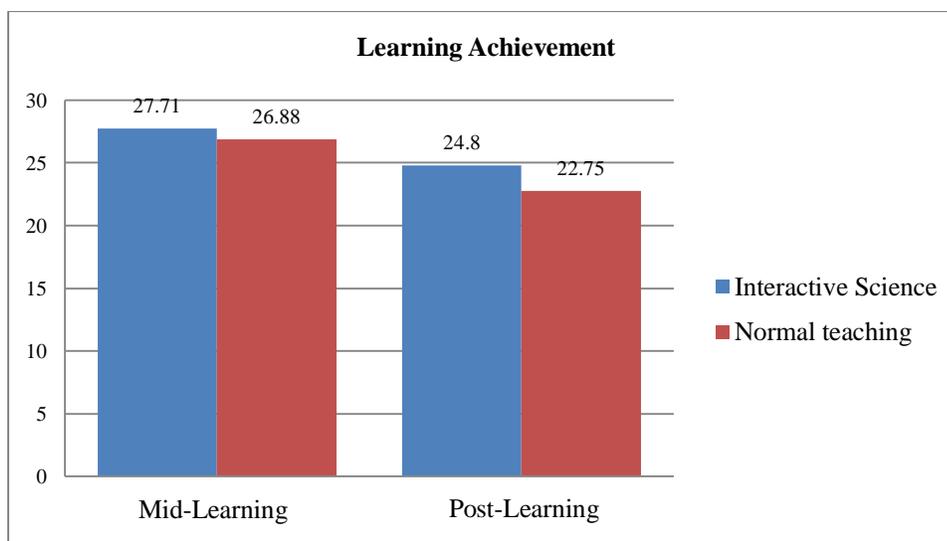
RESEARCH RESULTS

1. With respect to 40 physics students in semester 2017/1, most of them (26 or 65.0%) attended the physics class with normal teaching, while the other 14 students (35.0%) learned in the interactive science simulations-based physics class as presented in Table 1.

Table 1. Number and Percentage of Learning Group

Learning Groups	Number	Percentage
1. Normal Physics Teaching	26	65.0
2. Interactive Science Simulations-Based Physics Teaching	14	35.0
Total	33	100.0

2. Students in the interactive science-based teaching group had higher mid-learning achievement and post-learning score in physics than their classmates in the normal teaching group. Their mid-learning achievement was equivalent to 27.71 and 26.88, respectively. Likewise, their post-learning achievement was equivalent to 24.80 and 22.75, respectively (Figure 1).



3. Regarding mid- and post-learning achievement, students in the group of interactive science-based teaching and of normal teaching had similar physics achievement (Table 2).

Table 2. Comparison of Percentage of Suan Sunandha Rajabhat University Students’ Mid- and Post-Learning Achievement in Physics, Categorized According to the Teaching Approach



Mid-Learning	\bar{x}	S.D.	t	df	p-value
Normal Teaching	89.61	9.53	.83	38	.412
Interactive Science Simulations-Based Teaching	92.38	10.97			
Post-Learning					
Normal Teaching	75.83	12.66	1.52	38	.136
Interactive Science Simulations-Based Teaching	82.73	15.38			

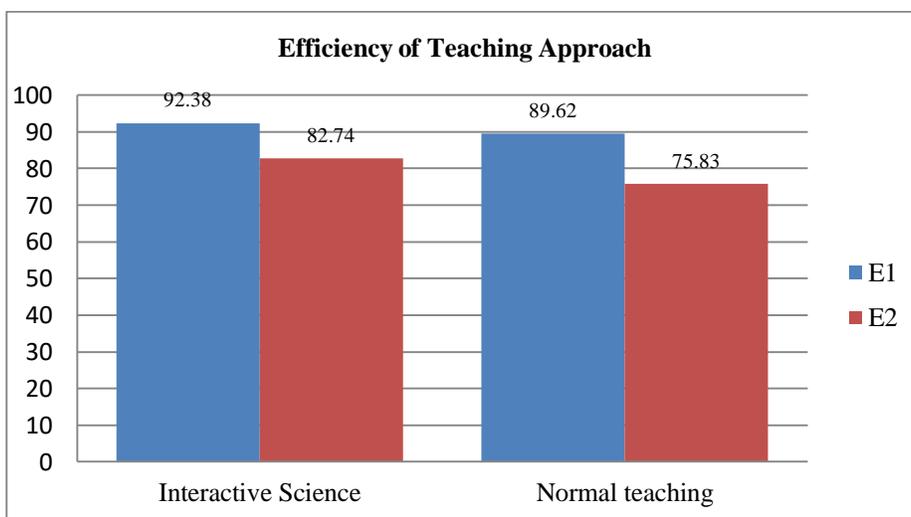
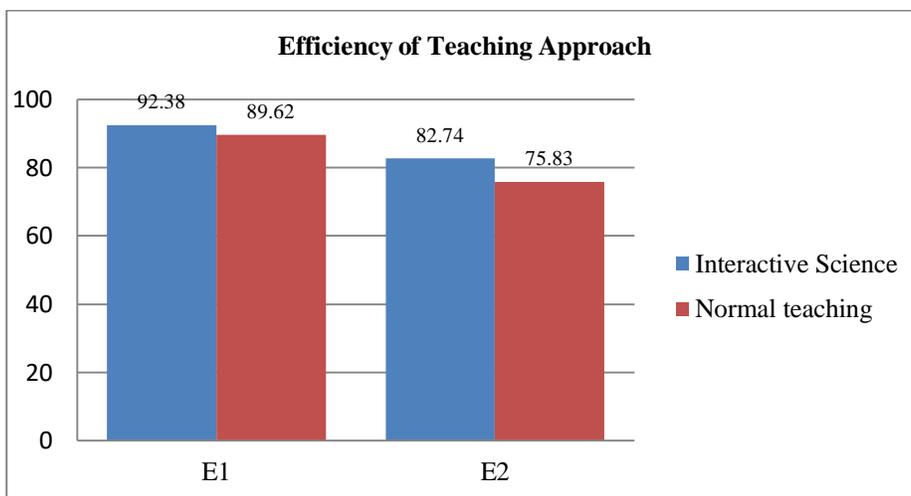
4. Mid-learning achievement of students in the group of interactive science simulations-based teaching and of normal teaching was higher than post-learning one at .05 level of statistical significance as in Table 3

Table 3. Comparison between Normal Teaching and Interactive Science Simulations-Based Teaching, Categorized According to Suan Sunandha Rajabhat University Students' Mid- and Post-Learning Achievement in Physics

Physics Learning Achievement	Group	\bar{x}	S.D.	t	df	p-value
Normal Teaching	Mid-Learning Score	89.61	9.53	5.73*	25	0.00
	Post-Learning Score	75.83	12.66			
Interactive Science Simulations-based Teaching	Mid-Learning Score	92.38	10.97	2.36*	13	0.03
	Post-Learning Score	82.73	15.38			

* Significant Level of 0.05

5. Process Efficiency (E1) compared to Result Efficiency (E2) of the efficiency of interactive science simulations-based physics lessons - E1/E2 was equivalent to 92.38/82.74. E1 or process efficiency in physics lessons was 92.38%, while E2 or result efficiency based on posttest was 82.74%. Meanwhile, process efficiency (E1) vs. result efficiency (E2) of the efficiency of normal lessons (E1/E2) was equivalent to 89.62/75.83. E1 or process efficiency in physics lessons was 89.62% and E2 or the result efficiency based on posttest was 75.83%. The efficiency of interactive science simulations-based physics lessons was higher than the normal ones at the efficiency value (E1/E2) equivalent to 92.38/82.74 and 89.62/75.83 respectively as shown in Figure 2



CONCLUSION AND DISCUSSION

According to the students’ physics knowledge based on mid-term and final score of the group of interactive science simulations-based physics teaching and of normal teaching, their learning achievement was found similar. Nonetheless, students in both groups have higher mid-learning achievement than post-learning one at .05 level of statistical significance. In particular, the efficiency of interactive science simulations-based physics lessons was higher than the normal one. The efficiency value (E1/E2) was equivalent to 92.38/82.74 and 89.62/75.83, respectively. This indicates that the interactive science simulations-based physics teaching and the normal one conformed to the instructional standards leading to the indifferent learning achievement. Moreover, the interactive science simulations-based physics teaching improved the instruction when compared to the normal one because the learners enjoyed virtual situation experience, witnessed the different process of changes and express reasons for solving problems. They also engaged in the in-class activities in which they could exchange ideas and principles and had participation in the instruction leading to wider learning atmosphere. This may



explain why the efficiency of the interactive science simulations-based physics teaching was higher than the normal one. It was supported by Siwa-amornrat (2009) who claimed that the simulations allowed learners to face problems and to critically think in solving future problems. Learners developed collective works in friendly environment and engaged in the instruction. The perception, understanding, reasons and abilities to solve problems also enhanced their farsighted vision. Likewise, Boochowong (2013) argued that the purpose of simulations-based teaching was to enhance learners’ engagement in the simulations for throughout understanding of different situations. The stimulations should thus be close to the reality. Consequently, when learners interact with such situation, they solved problems. The decisions they made in the stimulations would be the same to the real situation. The study of Gibbons (1995) cited in Siwa-amornrit (2009) on the impacts of stimulation implementation on students’ attitudes of mathematics learning revealed that the stimulations contributed to the students’ good attitude towards mathematics and to their better achievement of mathematics learning.

SUGGESTIONS

1. Suggestions based on the application of research results
 - 1.1 The interactive science simulations-based teaching should be continually developed.
 - 1.2 The interactive science simulations-based teaching should be applied in other subjects.
2. Suggestions for future research
 - 2.1 The applied research on the interactive science simulations-based instruction in scientific courses should be carried.
 - 2.2 The relationships between instructional attitude and interactive science simulations-based teaching should be studied.

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Design of Broadband and Low profile Microstrip Patch Antenna using Strip Slot Hybrid Structure

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ABSTRACT

This study discussed the design and development of C-band Micro strip patch Antenna with Strip-Slot Hybrid Structure. The proposed antenna consisted of four strips which were separated by three narrow slots, ground plane with coupling aperture and Y-shaped feeding structure. The strip-slot feeding structure used to enhance the bandwidth up-to 41% by controlling the dimensions of the strips and the slots. The designed antenna was modelled in CST MW studio. The proposed antenna fabricated on FR-4 substrate with dielectric constant 4.4. The fabricated antenna was tested in the far-field antenna test range and Network Analyser. The test results were compared with simulated results. The proposed structure was good candidate for broadband data link and altimeter applications in airborne vehicles.

Keywords: Hybrid Structure, Low profile, Strip-slot and Y-shaped Feeding

INTRODUCTION

With the rapid development of wireless communications, the microstrip antenna has been generally applied in many communication devices because of its obvious advantages (e.g., low manufacturing cost, easy fabrication, and low profile). However, the main limitation of traditional microstrip antennas is the narrow impedance bandwidth (typically less than 3% with reflection coefficient lower than -10 dB). For various wideband wireless communication services, several bandwidth enhancement techniques based on microstrip antennas have been studied and verified (Aanandanand & Nair, 1986; Huynh & Lee, 1995; Yang, Zhang, Ye, & Rahmat-Samii, 2001; Qu & Xue, 2007; Bhatnagar, Saini, Saxena, & Joshi, 2011). The use of six rectangular strips in Aanandanand and Nair's study (1986) realized a larger impedance bandwidth of 6%. A broadband circular microstrip antenna achieved a fractional bandwidth of 13.6% using diamond shaped slot in the study of Bhatnagar et al. (2011). By embedding a U-shaped slot within the rectangular patch, the impedance bandwidth is achieved over 20% (Huynh & Lee, 1995). A broadband E-shaped microstrip antenna was presented in the study of Yang et al. (2001) to achieve an excellent bandwidth of 30.3%. A Y-shaped stub proximity-coupled V-slot microstrip antenna presented in Qu and Xue's study (2007) showed an enhanced impedance bandwidth of 21%. As another feasible solution to improve the bandwidth of microstrip antennas, planar multilayer configuration was used in Kumar & Ray's study (2001) with 25% bandwidth. With the similar strategy, aperture-coupled stacked microstrip antennas were achieved with the bandwidth over 20% for millimetre-wave applications (Croqand & Pozar, 1991) and over 25% on a low-temperature co-fired ceramic substrate (Kuo-Sheng, Ho-Ting, & Jia-An, 2010). Based on double-Y-shaped aperture-coupling technique, a 10dB impedance bandwidth of 71% (3.28–6.76 GHz) was achieved in the study of Wei, Jiang, and Peng, (2017) with the size of 28×28×15mm.

To improve the impedance bandwidth of traditional microstrip antennas, a low profile wideband microstrip antenna with strip-slot hybrid structure was designed. The strip-slot hybrid structure was composed off four strips and three narrow slots. A Y-shaped microstrip feeding line was introduced to feed



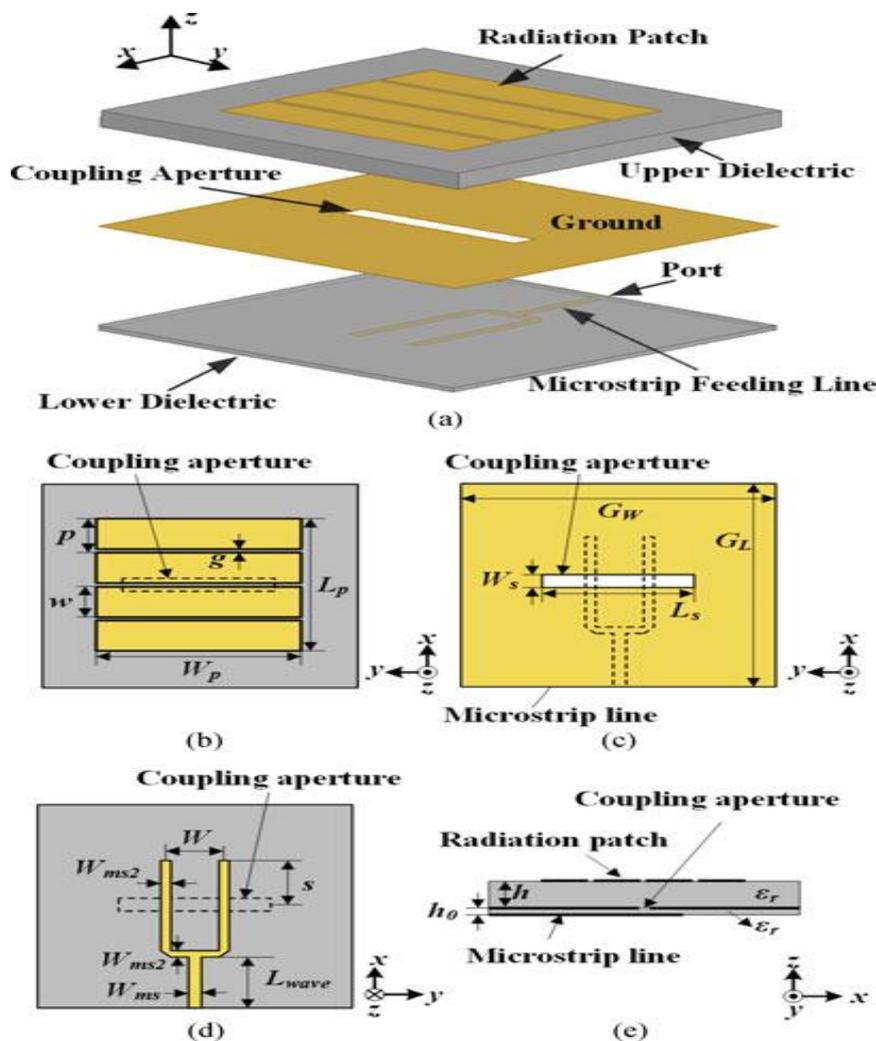
this antenna through a coupling aperture on the ground. By optimizing the sizes of the strips and the slots, TM₁₀ mode and antiphase TM₂₀ modes were excited. The coupling of two resonant modes enhanced the impedance and pattern bandwidths up to 41% with a substrate thickness of 0.06λ₀. The strip-slot hybrid structure was optimized using the full-wave simulation software of CST microwave studio and validated experimentally.

ANTENNA DESIGN

The overall geometry of the microstrip antenna with strip-slot hybrid structure is illustrated in Figure 1. This antenna has a three-layer structure and Figure 1(a) shows the perspective view of the layered structure. There are three metallic layers: radiating patch on the top layer, ground plane with coupling aperture on the middle layer, and Y-shaped feeding structure on the bottom layer. Between the three metallic layers, there are two

with the relative ε₀ of 4.4 tangent The volume dielectric GL × h, lower GW × In we can radiating strip slot structure,

of four strips series coupling between. are coupled other. and each strip w, and coupling



layers dielectrics same permittivity and loss of 0.0027. overall of the upper is GW × and the dielectric is GL × h0. Figure 1(b), see that the patch has a hybrid which is composed identical arranged in with gap in All of them proximity to each The length widths of are WP and the gap of g.



Figure 1: Geometry and dimensions of the proposed antenna: (a) Perspective view of the layered structure, (b) top layer of the radiating patch with strip-slot hybrid structure, (c) middle layer of the ground with the coupling aperture, (d) bottom layer of the Y-shaped feeding line, and (e) side view of the overall structure.

The coupling aperture is cut on the ground plane, and placed underneath and parallel to the center slot on the top layer. The dimensions of the coupling aperture are $L_s \times W_s$. The Y-shaped microstrip feeding structure is printed on the bottom layer of the lower dielectric, and it is symmetrical with respect to the y -axis. This microstrip feeding line is composed of two sections including the straight section of width W_{ms} and two arm sections of equal width W_{ms2} . The length of the straight section is L_{wave} . The end of the arm section has a vertical distance of s away from the y -axis. The distance between the two arms is W . By optimizing the dimensions of the strip-slot hybrid structure and Y-shaped feeding structure, the impedance bandwidth of this antenna can be improved obviously. The side view of the proposed antenna is shown in Figure 1 (e), and all the optimized dimensions of the proposed antenna are tabulated in Table I.

Optimized dimensions of the antenna (units: mm)

p	g	Wp	GL	GW	W_s	L_s	w
10	1.1	40	60	60	3.8	29	8.9

W	s	W_{ms}	W_{ms2}	L_{wave}	h_0	h
8	10	1.85	1.75	15	0.813	3.25

To understand the operating mechanism of the antenna, current distributions at three resonances are shown in Figure 2. These three resonances appear at the frequencies of 4.7, 5.5, and 6.3 GHz, respectively. Except for the radiation of the slots between adjacent strips, the current distributions at 4.7 GHz are similar to the TM_{10} mode excited in the traditional microstrip antenna. On the other hand, the current distributions at 5.5 and 6.3 GHz are almost the same, and the resonant mode resembles the antiphase TM_{20} mode. Due to the radiation of the coupling aperture and the strip-slot hybrid structure, the opposite sides of the center slot have the antiparallel E-fields. The theoretical analysis and calculation of the antiphase TM_{20} mode can be carried out by using the transmission-line model (Liu, Chen, & Qing, 2015). By coupling the two resonant modes together, enhanced bandwidth was reported.

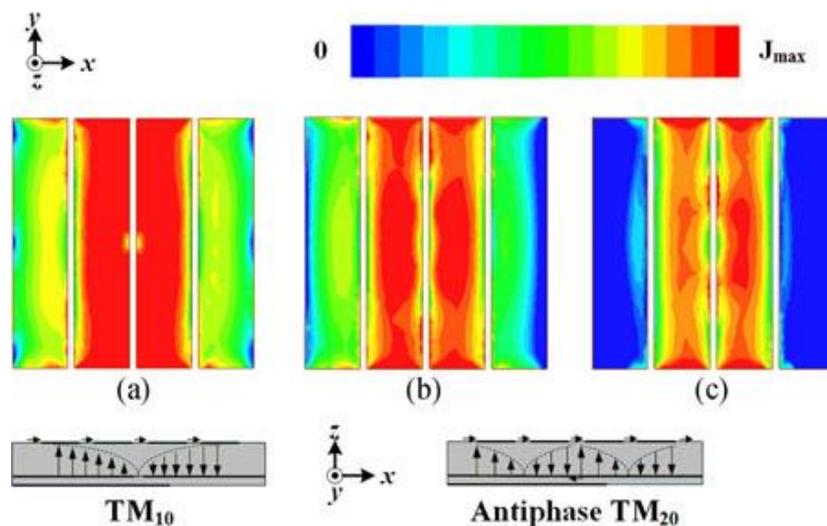




Figure 2. Current distributions and operating modes of the antenna at different resonances: (a) 4.7 GHz. (b) 5.5 GHz. (c) 6.3 GHz.

SIMULATED RESULTS

The C-band micro strip patch antenna with Strip-Slot Hybrid Structure is designed and simulated using CST Microwave Studio software.



Figure 3. simulated Reflection Coefficient of the designed antenna

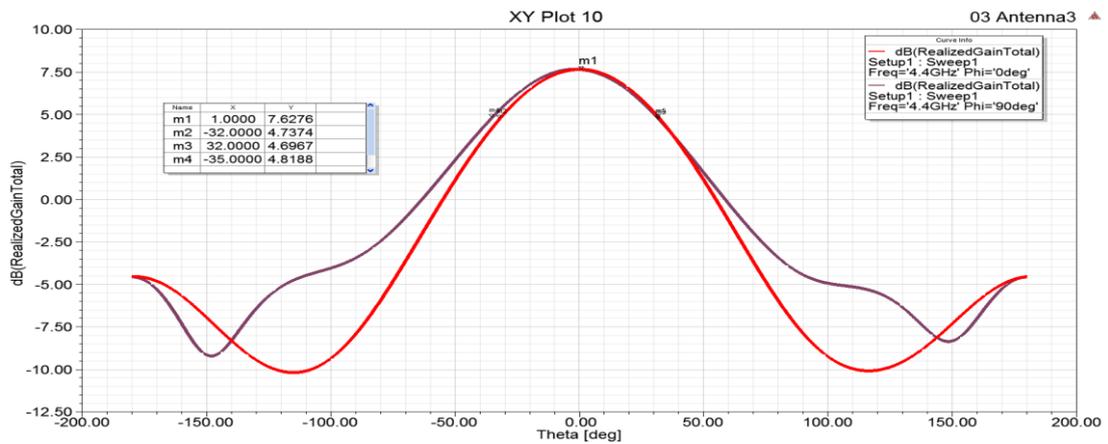


Figure 4. Radiation pattern of the Antenna in E_L & A_z at 4.4 GHz

The simulated reflection coefficient in Figure 3 shows a bandwidth of 2.1GHz. The radiation pattern of the antenna at 4.4 GHz is shown in the figure 4. In the simulation, the gain achieved is 7.62dBi in both E_L & A_z planes. Similarly, radiation patterns of the antenna at 5.4, 5.9 and 6.4GHz are shown in Figures 5, 6, and 7. The simulated gain is 9.8, 11.21 and 8dBi respectively for the above three frequencies.

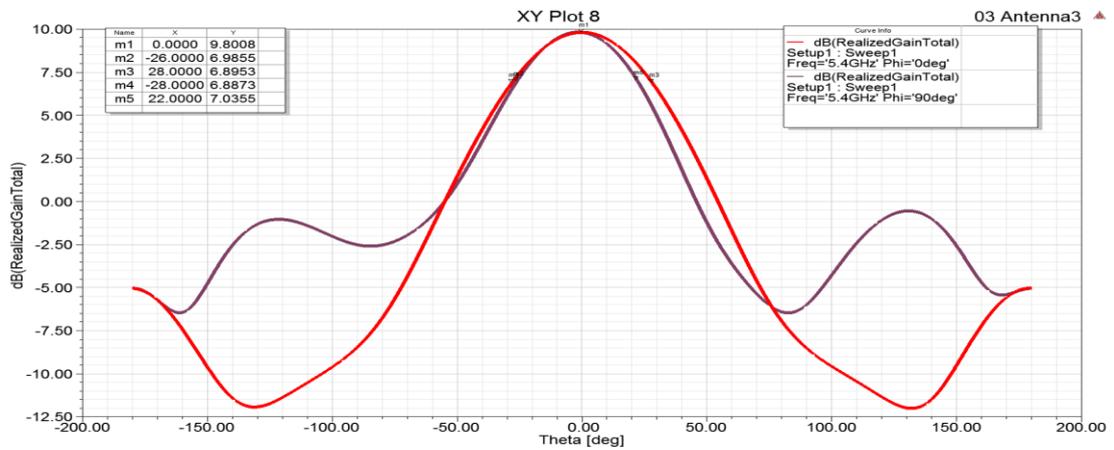


Figure 5. Simulated Radiation pattern of the Antenna in EL & AZ at 5.4 GHz

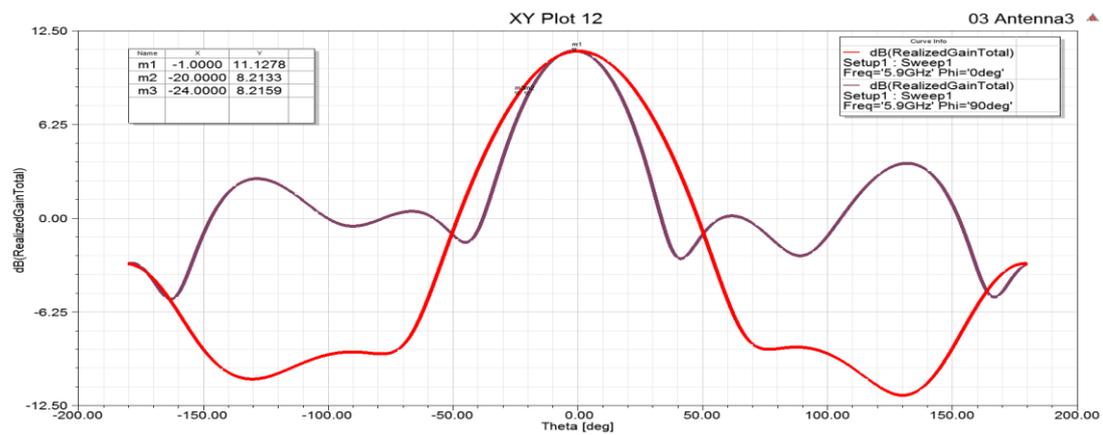


Figure 6. Simulated Radiation pattern of the Antenna in EL & AZ at 5.9 GHz

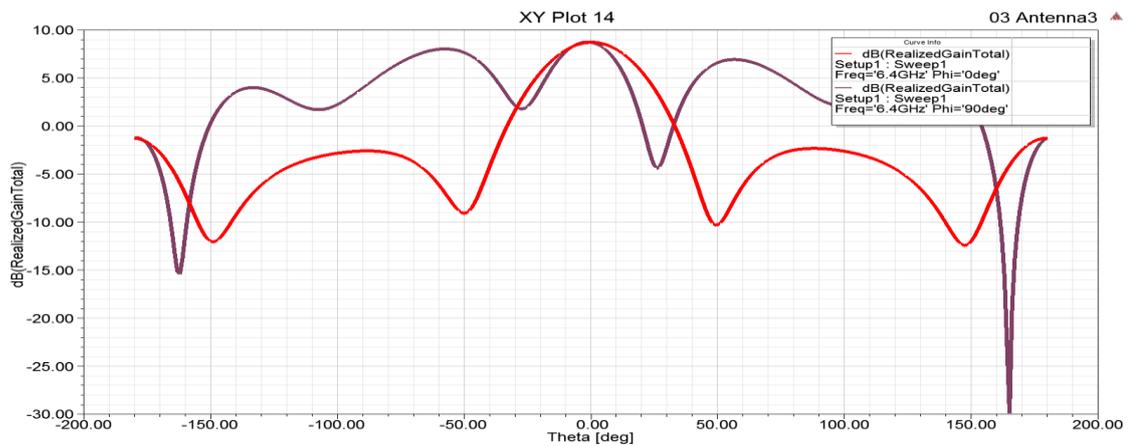


Figure 7. Simulated Radiation pattern of the Antenna in EL & AZ at 6.4 GHz



MEASURED RESULTS

The broadband low profile micro strip antenna was fabricated and the return loss results were tested using the Network Analyzer.

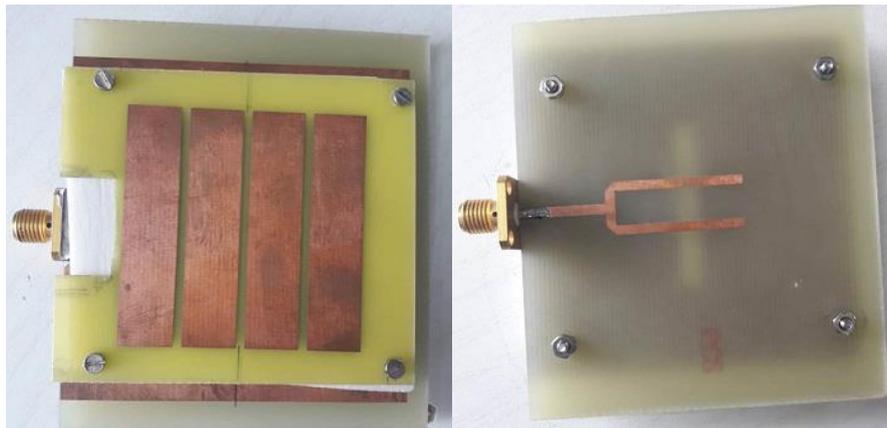


Figure 8. Photograph of the fabricated antenna



Figure 9. Return loss measured in Network Analyzer

The measured return loss was less than 10dB between 4.4GHz and 6.4GHz is shown in figure.9.

The Gain of the broadband and low profile antenna was measured at 4.4 GHz, 5.4 GHz, 5.9 GHz and 6.4 GHz and shown in the figures 5.6, 5.7, 5.8, 5.9 respectively. The results are almost comparable to the simulated results.

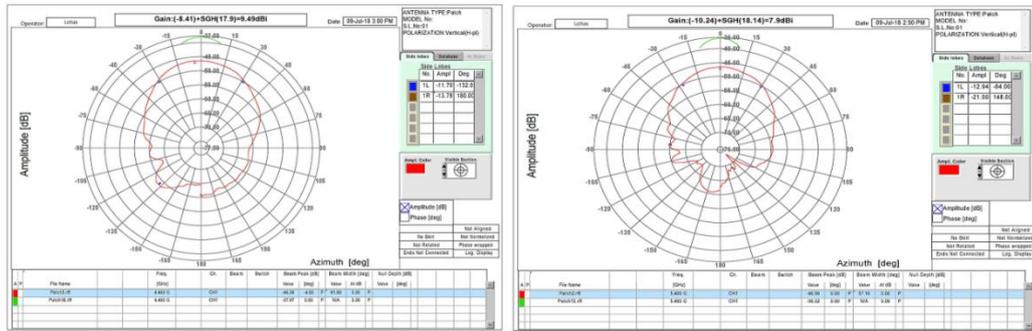


Figure 10. Gain measurement of antenna at 4.4 GHz and 5.4 GHz

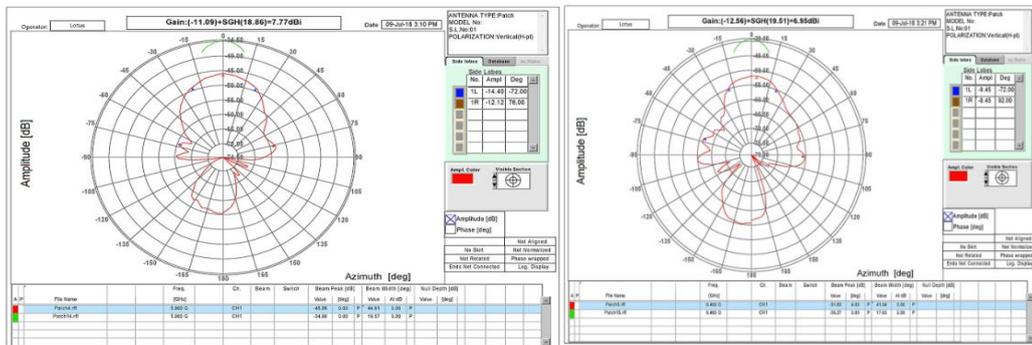


Figure 11. Gain measurement of antenna at 5.9 GHz and 6.4 GHz

The Radiation patterns of the broadband and low profile antenna was measured at 4.4 GHz, 5.4 GHz, 5.9 GHz and 6.4 GHz which were presented in the Figures 10, 11, 12, 13 respectively. The results are almost comparable to the simulated results.

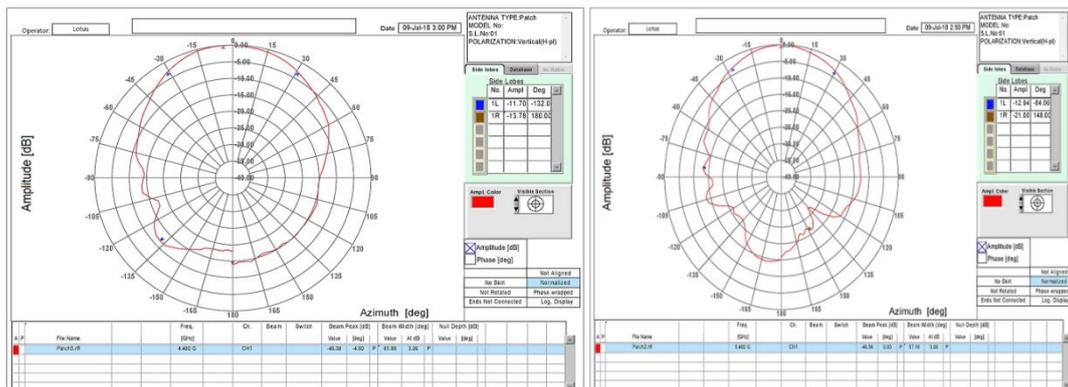


Figure 12. Radiation pattern of the Antenna at 4.4 GHz and 5.4GHz

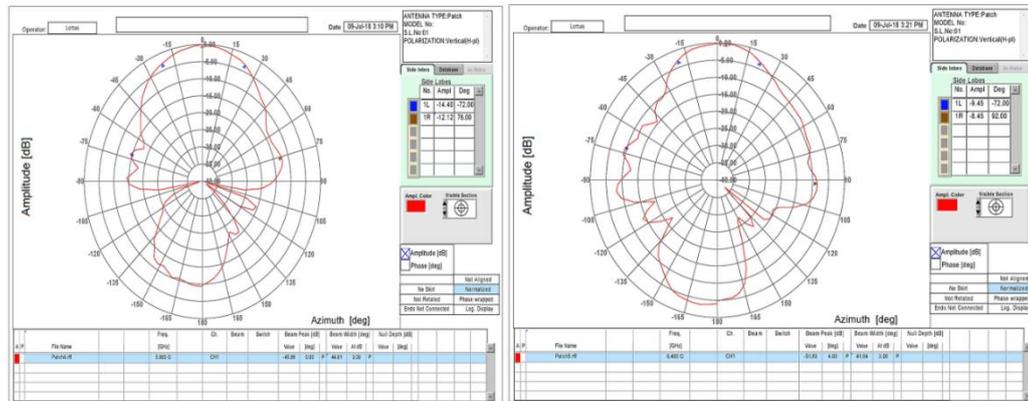


Figure 13. Radiation pattern of the Antenna at 5.9 GHz and 6.4GHz

Table 1. Comparison of simulated and test results of Reflection coefficient of antenna

S.No	Simulated Results		Test Results	
1	f1=4.40GHz	-9.4	f1=4.40GHz	-14.56
2.	f2 = 5.4GHz	-13.0	f2 = 5.4GHz	-9.77
3.	f3 = 5.9GHz	-21.0	f3 = 5.9GHz	-13.48
4.	f3 = 6.4GHz	-10.44	f3 = 6.4GHz	-10.5

Table 2. Comparison of simulated and test results of Gain of antenna

S.No	Simulated Results		Test Results	
1	f1=4.40GHz	7.6	f1=4.40GHz	9.49
2.	f2 = 5.4GHz	10.0	f2 = 5.4GHz	7.9
3.	f3 = 5.9GHz	11.25	f3 = 5.9GHz	7.77
4.	f3 = 6.4GHz	9.0	f3 = 6.4GHz	6.95

CONCLUSION

The experimental results obtained during the investigation demonstrate a promising new approach to the design of antennas whose performance is reaching the desirable specifications. Broadband and low profile microstrip antenna consists of four strips, which are separated by three narrow slots, ground plane with coupling aperture, and Y-shaped feeding structure. By controlling the dimensions of the strips and the slots, dual modes, TM₁₀ mode, and antiphase TM₂₀ mode are excited and coupled to increase the operating bandwidth. Due to the characteristics of broadband and low profile, the proposed antenna is good candidate for broadband data link and altimeter applications in airborne vehicles.

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Investigation into Laser Surface Modification of Stainless Steel

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ABSTRACT

Laser surface modification of metals is performed by irradiating a laser beam at the workpiece surface, where the heating and partial melting of metal take place and in turn alter the physical and/or metallurgical structures of metal surface to be a desired feature. However, the use of improper laser heating conditions can decrease the process performance as well as the quality of workpiece surface obtained. To understand the roles of laser in the metal surface modification, this study therefore investigated the effects of laser heating parameters on the roughness and morphology of metal surface. Stainless steel grade 316L was selected as a work sample in this study. Accordingly, average laser power, laser scanning speed and scan overlap were the major process parameters tested in this work, where the surface roughness of laser-scanned area was quantitatively and qualitatively analyzed. The experimental results revealed that using high laser power together with slow scanning speed and no scan overlap provided the average surface roughness of up to 0.701 μm . In addition, the formation of metal recast was evidenced in the laser-irradiated surface. The significance of this study could bring a deeper understanding of process behaviors and also recommend a practical guideline for controlling the quality of metal surface induced by laser.

Keywords: *Laser, Stainless steel, Surface modification*

INTRODUCTION

Lasers have largely been employed in manufacturing for cutting and welding processes due to their fast processing rate, high processing resolution, and ease of automation. Besides the metal cutting and welding processes, the surface modification of metals is another application of lasers to rapidly and precisely alter the physical and/or chemical properties of metal surface/subsurface for attaining a specific purpose, such as improving wear/corrosion resistance (Shin, Chung, Park, & Chu, 2011), roughing/smoothing the surface (Ukar, Lamikiz, Pozo, Pez De Lacalle, & Arana, 2011) or introducing hydrophobic/hydrophilic surface (Chen, Ge, & Liu, 2017). These can find in the preparation of functional surface in the multi-scale manufacturing processes. The laser surface modification uses a laser beam with a lower laser power than the laser cutting and welding processes to scan over the workpiece surface. The work material irradiated by the laser beam undergoes the metallurgical transformations in solid status or even melts and then significantly changes the surface roughness and morphology. In general, the laser power used for the metal surface modification is kept below the vaporization threshold of work material in order to prevent the material removal.



There are a number of studies investigating the laser heating and melting of metal surface. Shin et al. (2011) used a 4-W nanosecond-pulse laser to oxidize the surface of AISI304 stainless steel, in which chromium oxides were intensively formed on the surface and in turn promote the corrosion resistance of steel surface. Similarly, Cho, Shin, and Chu (2014) performed the selective laser marking of cylindrical stainless steel surface for the electrochemical etching process. The laser-marked area enriching with chromium and iron oxides could better withstand the etching process than the non-irradiated area, so that the micro-patterns could then be formed on the steel surface. However, using too high heat input (i.e. high laser power and/or slow scanning speed) can increase the thickness of recast layer on the work surface (Shin et al., 2011) and adversely enlarge the heat-affected zone (Long, Liu, Zhong, Xiong, & Shi, 2015). Thus, a suitable processing condition is a must to yield the desired surface characteristics with less detrimental effects induced by laser. However, the understanding of laser surface modification process still needs to be more elaborated both in quantitative and qualitative aspects to widen its viability in manufacturing.

In this study, the effect of major laser parameters on the surface roughness of metal was investigated. Average laser power, scanning speed and scan overlap were the three major parameters examined in this study, and the stainless steel grade 316L was selected as a workpiece which surface was to be modified by a nanosecond-pulse laser. The implication of this study could provide a better understanding on the principle mechanics of the laser surface modification of steel and also expose the influence of the three parameters on the process performance.

MATERIAL AND METHOD

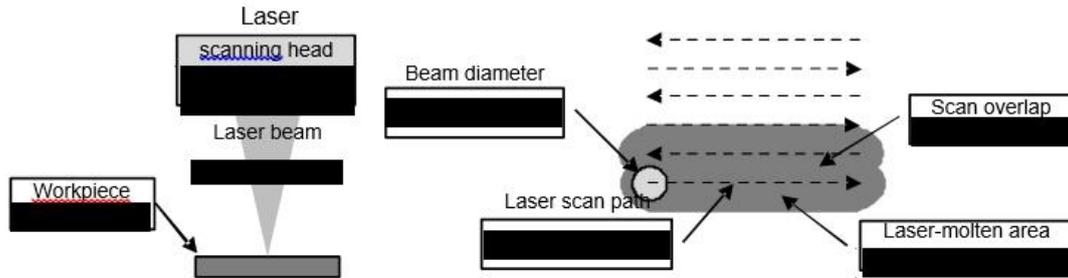
A nanosecond pulse laser emitting a wavelength of 1064 nm was used in this study to modify the surface of AISI316L stainless steel. The initial roughness (*Ra*) of steel surface was 0.101 μm . The laser pulse repetition rate and pulse duration were kept constant at 100 kHz and 120 ns, respectively. The values of average laser power, scanning speed and scan overlap examined in this study were listed in Table 1. The selection of these parameters' values was based on a number of preliminary experiments, where the heat input induced by laser was not too high to cause the material removal and also not too low to insignificantly change the metal surface. The laser scan pattern is shown in Figure 1, showing the back-and-forth scanning direction and the overlap between the laser-molten tracks. A laser beam having the Gaussian distribution was focused at the workpiece surface and its diameter was 37.66 μm . However, the track width is not necessarily equal to the beam diameter but it is dependent on the laser energy density applied to the workpiece and the size of molten region. The scan overlap accounted in this study was quantified as a percentage of the track width instead of the beam diameter. Thus, the spacing distance between the consecutive laser paths for a given scan overlap was individually determined from each processing condition as given in Table 2. It can be noticed from the data listed in the table that using higher laser power and/or slower scanning speed provides a wider laser-molten track. This is relevant to the laser energy density that is gained under such conditions and consequently expands the molten region so as the track width.

Table 1.
Process Parameters Tested in This Study

Parameters	Values
Average laser power (W)	2, 3, 4
Scanning speed (mm/s)	50, 100, 150, 200, 250
Laser scan overlap (%)	0, 25, 50



Figure 1.
Experimental Setup and Laser Scan Pattern



The average surface roughness (Ra) of each sample was measured by a profilometer both along and across the laser scan direction, and each of which was repeated three times. All six measures of Ra were then averaged and compared to the others for the quantitative analysis. The laser-scanned surface was also observed by a digital microscope (VH-Z500R, Keyence, Japan) to enable the visual inspection of surface morphology in the qualitative aspect.

Table 2.
Spacing Distance (μm) for Each Processing Condition

Laser power (W)	Speed (mm/s)	0% overlap	25% overlap	50% overlap
2	50	28.7	21.5	14.3
2	100	25.5	19.1	21.7
2	150	25.5	19.1	21.7
2	200	23.5	17.6	11.7
2	250	22.7	17	11.3
3	50	34.3	25.7	17.1
3	100	29.8	22.3	14.9
3	150	28.3	21.2	14.1
3	200	28.2	21.1	14.1
3	250	26.5	20.2	13.2
4	50	34.8	26.1	17.4
4	100	33.8	25.3	16.9
4	150	32.2	24.1	16.1
4	200	30.8	23.1	15.4
4	250	29.7	22.2	14.8

RESULTS AND DISCUSSION

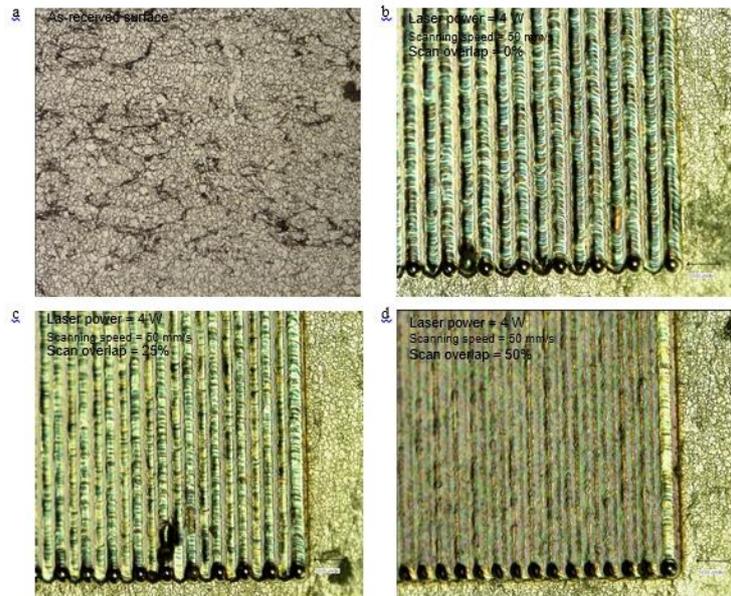
The morphology of as-received and laser-modified surfaces is shown in Figure 2, clearly indicating the different track overlaps in the work surface. The fish-scale pattern occurred along the tracks was the result of melting and resolidification. Such feature can also be found in the laser welding/melting process, and this typically roughens the work surface. As per the figure, the work material in the overlapped region was found to protrude from the work surface and this can be more distinguished when using a larger overlap condition (Figure 2(d)).

The average surface roughness (Ra) of the laser-modified surfaces was plotting in Figure 3, showing the relationships between the laser power, scanning speed, scan overlap and surface roughness. According to the results, an increase in the laser power was found to roughen the metal surface. This is due to the



increased heat energy that enlarges the molten region (Table 2) and in turn enhances the fluidity of the molten track. After the solidification of molten material, a more distinguishable fish scale as well as the protruding recast can be realized, thus increasing the roughness. The initial surface roughness of stainless steel sample was $0.101 \mu\text{m}$, but the average roughness could be increased up to $0.701 \mu\text{m}$ when the laser power of 4 W was applied. As per the figure, the influence of laser scanning speed was inversely proportional to the surface roughness. The increase in scanning speed linearly decreased the roughness, and the average decreasing rate was about $0.001 \mu\text{m}\cdot\text{s}/\text{mm}$. By considering the range of speeds examined in this study, the surface roughness could be decreased by 50% when the scanning speed was changed from 50 mm/s to 250 mm/s or four times faster than the minimum one.

Figure 2.
Surface Morphology of As-Received and Laser-Modified Surfaces Obtained under Different Scan Overlaps



The effect of laser scan overlap on the average surface roughness is also depicted in Figure 3. As presented in the figure, the 0% scan overlap provides a rougher surface than the others, although this effect is not significantly different in some conditions. When no overlap was applied in the process, each laser-scanned track was heated and melted only one time. In contrast, the overlap conditions can remelt a portion of rough track region, such as the fish-scale marks to be a more even or smoother surface. This relationship is also in line with the study of Khalid Hafiz, Bordatchev, & Tutunea Fatam (2012), noting that the larger the overlap, the smoother the workpiece surface can be achieved. However, they found that the laser-scanned surface becomes rougher when the overlap is greater than 95% of the beam diameter. Since our study considered the maximum overlap of only 50%, the turning point of surface quality at the large scan overlap has not been evidenced in our results. With regard to the findings, the average surface roughness of non-overlap samples for all combinations of laser power and scanning speed was about $0.356 \mu\text{m}$, while it was decreased to $0.312 \mu\text{m}$ and $0.291 \mu\text{m}$ for the 25% and 50% overlap conditions, respectively. The roughest surface ($0.701 \mu\text{m}$) was obtained when the laser power of 4 W, scanning speed of 50 mm/s and scan overlap of 0% were used. On the contrary, using the 2-W laser power together with the 250-mm/s scanning speed and 50% scan overlap can provide the lowest R_a of $0.067 \mu\text{m}$. The smoothest



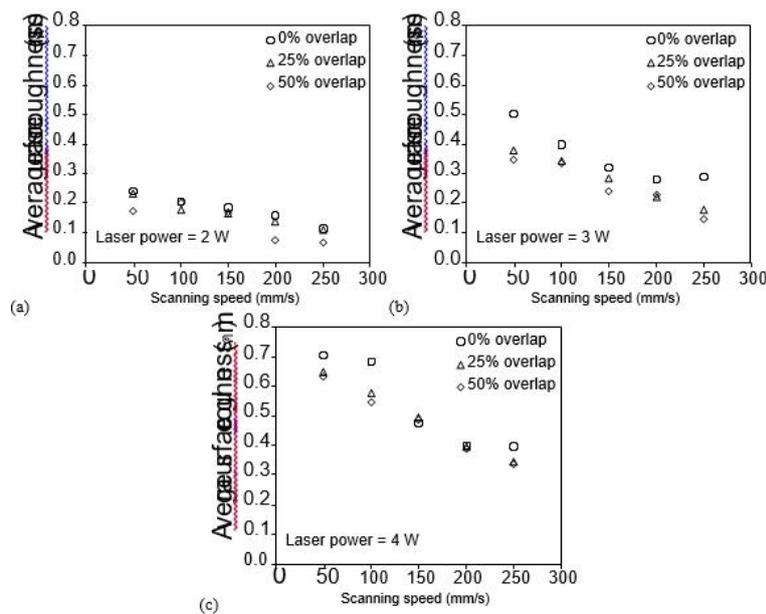
surface found in this experiment was smoother than the initial roughness by 33%. Thereby, this condition can further be applied for the laser polishing of metal surface. Based on the *Ra* results, a predictive model for *Ra* written as a function of the three process parameters was formulated by using the regression analysis, and the model is expressed as:

$$R_a = 0.0068v + 0.001P - 0.0013SO$$

where *v*, *P* and *SO* are the scanning speed, laser power and scan overlap, respectively. The adjusted *R*² value of this model is 0.931, indicating the goodness of model fitting. This developed model can facilitate the determination of *Ra* from a given processing condition.

Figure 3.

Effect of Laser Power, Scanning Speed and Scan Overlap on the Average Surface Roughness



CONCLUSIONS

Laser surface modification of AISI316L stainless steel was experimentally investigated in this study, where the effect of laser power, laser scanning speed and scan overlap on the surface roughness was qualitatively and quantitatively analyzed. The initial roughness of stainless steel surface was 0.101 μm, while it can be smoothed to be 0.067 μm after being treated by a laser beam with the 2-W laser power, 250-mm/s scanning speed and 50% scan overlap. This is equivalent to the 33% improved from the initial roughness. By using a higher laser power, slower scanning speed and/or smaller scan overlap, the metal surface roughness tended to increase linearly. Additionally, such rough surface could find its advantage in some industrial applications, such as the preparation of hydrophobic/hydrophilic features which require a specific texture/pattern to be manufactured on the workpiece surface. A predictive model for *Ra* was also developed in this study with the adjusted *R*² of 0.931. The model and the influence of process parameters presented in this paper can enable a better understanding of process behaviors in the laser surface modification of stainless steel so as other similar metals.



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Estimation of GNSS Receiver Bias Using Fitted Receiver Bias Method

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ABSTRACT

Global Navigation Satellite System (GNSS) is a collective term given to all the satellite based navigation systems that provides accurate user position, velocity and timing information anywhere in the world. Among various GNSS, GPS is the first operational GNSS. GPS positional accuracy is mainly affected by ionospheric time delay error, which depends up on, the Total Electron Content (TEC) (the integral of the electron density along the ray path between satellite and receiver, it provides the number of electrons per square meter). TEC measurements are corrupted by receiver instrumental bias. The instrumental biases occur due to the frequency dependent delays of analog hardware within the GPS satellite and receiver. Hence, to compute the user position, estimation of receiver bias is essential. One of the simple and less complex method for estimation of receiver bias is Fitted Receiver Bias (FRB) method. To carry out this work, GPS data was collected from two GPS receivers (NovAtel Dual frequency GPS receiver (GSV4004B) at Begumpet (Lat: 17.45°N Lon: 78.47°E) and (GPStation6 (NovAtel) at Hyderabad (Lat: 17.40°N Lon: 78.51°E)), India. In this paper, the receiver instrumental bias of two different receivers was estimated using FRB method. It was observed that estimated receiver bias for NovAtel receiver was -6ns and GPstation6 receiver was -11ns. Two GPS PRN satellites data were considered. In GSV4004B receiver, PRN16, PRN22 and in NovAtel receiver, PRN2, PRN12 satellites were considered. Before removal of instrumental bias, the TEC values obtained were negative values and after removing the receiver bias, the TEC values obtained were positive values. Hence, FRB method is very helpful for estimation of GPS instrumental biases, which greatly helps in improving the user position accuracy for Civilian Applications, such as transportation, search, and rescue operations etc.

Keywords: *Fitted Receiver Bias, GNSS, Receiver instrumental bias and Total Electron Content*

INTRODUCTION

Satellite navigation has evolved from being purely under the control of USA, Department of Defense. In the present day, there are multiple GNSS like GPS of USA, such as GLONASS of Russia, GALILEO of the European Union, and Beidou of China. Accordingly, there are Regional Navigation Satellite Systems (RNSS) like Indian Regional Navigation Satellite System (IRNSS) of India, and Quasi Zenith Satellite System (QZSS) of Japan. A user can determine his position - latitude, longitude, and altitude by receiving signals from these satellites with the help of an appropriate GNSS receiver. The position accuracy of GPS system is limited by



several errors, such as ionospheric error, tropospheric error, clock error, multipath, and ephemeris error. Among all of the errors, ionospheric time delay error is the predominant. Total Electron Content (TEC) is an important parameter for the estimation of ionospheric time delay. TEC is defined as number of free electrons contained in a tube of 1 m² cross-section extending from the satellite to the receiver and is measured in TECU (1 TECU = 10¹⁶ el/m²) (Sadón & Zarraoa, 1997; Kumar, Sarma, & Reddy, 2014). The uncertainties in the TEC calculation are caused by various errors, such as satellite and receiver instrumental biases. The instrumental bias occurs due to the frequency dependent delays of analog hardware within the GPS satellite and receiver (Ma & Maruyama, 2003). These biases exists due to the signals at two GPS frequencies ($f_1=1575.42$ MHz, $f_2=1227.60$ MHz) undergo different delays. In this paper, a simple method known as Fitted Receiver Bias (FRB) was considered for estimation of receiver bias.

FITTED RECEIVER BIAS METHOD

FRB method provides a rough estimation of receiver bias. Let STEC (the total number of free electrons in a column of the unit cross section along the path of the electromagnetic wave in ionosphere between the satellite and receiver) represent the Slant TEC consisting of the satellite bias (b_s) and receiver bias(b_r). Let $STEC_l$ be the STEC obtained after the biases (b_s and b_r) are removed from STEC. Therefore $STEC_l$ is given by (Chiablaem, Supnithi, Klinngan, Kenpankho, Panachart, Watthanasangmechai, Yokoyama, Ishii, & Saekow, 2016).

$$STEC_l = (STEC - b_s - b_r) \quad (1)$$

In FRB method, the estimation of GPS receiver bias is based on the standard deviation of Vertical TEC (VTEC) due to all visible satellites. Initially, STEC is converted to VTEC as in the studies of Parkinson and Spilker (1996), and Misra and Enge (2001).

$$VTEC = STEC_l * \cos \chi \quad (2)$$

Where, $\cos(\chi)$ is the slant factor and it is related to the elevation angle of the GPS satellite. It is calculated by,

$$\cos \chi = \sqrt{1 - \left(\frac{R}{R+h} \cos(el)\right)^2} \quad (3)$$

Where ‘R’ is the radius of the earth (6378 km), el is elevation angle of the satellite and ‘h’ is the height of ionospheric thin shell (350 km).

If ‘ $\sigma_u(n)$ ’ represent standard deviation of VTEC of each PRN and Lt is the total number of satellites, then $\sigma_u(n)$ can be given as,

$$\sigma_u(n) = \sqrt{\frac{1}{Lt} \sum_{i=1}^{Lt} \left(VTEC_u^m(n) - \overline{VTEC_u}(n) \right)^2} \quad (4)$$

Where ‘ $\overline{VTEC_u}(n)$ ’ is the average VTEC of total number of satellites, ‘u’ denotes the receiver station index, m denotes the satellite index and n is the time sample.

The total standard deviation of all the visible satellites, ‘ σ_{Total} ’ is given as

$$\sigma_{Total} = \sum_{i=1}^{Lt} \sigma_u(n) \quad (5)$$



The ‘ σ_{Total} ’ value is computed for varying values of receiver bias. The bias value for which the ‘ σ_{Total} ’ value is minimum, and is considered as the receiver bias of that particular receiver.

METHODOLOGY

Receiver biases of two different receivers located at Hyderabad, India were computed in this paper. One receiver was NovAtel Dual frequency GPS receiver (GSV4004B) (Lat: 17.45⁰N Lon: 78.47⁰E) at Begumpet, Hyderabad. The other receiver, GPStation6 (NovAtel) (Lat: 17.40⁰N Lon: 78.51⁰E), was located at Advanced GNSS Research Laboratory (AGRL), Department of ECE, Osmania University, Hyderabad. For estimating the receiver bias using FRB method only night time, STEC data was considered when there were no much variation in STEC. The STEC was converted to Vertical TEC (VTEC) with the help of Slant factor (Eqn.2 and Eqn.3). ‘ σ_{Total} ’ was computed using standard equations (Eq.4 and Eq.5). As a result, receiver bias was varied from -30 ns to +30 ns in the steps of 1ns. The bias value corresponding to minimum standard deviation of VTEC was the estimated receiver bias.

RESULTS AND DISCUSSION

Figure 1 shows the results of receiver bias estimation of NovAtel Dual frequency GPS receiver (GSV4004B) on 2nd August 2016. Standard deviation of VTEC due to two PRNS, PRN16 and PRN22 are visible during 2.5-5 Hrs LT, for receiver bias variation of -30 ns to +30 ns (Figure 1). It is presented in Figure 1 that the minimum standard deviation of VTEC (13.987 TECU) occurs at receiver bias of -6 ns. Therefore -6ns is considered as receiver bias (b_r) for the GAGAN receiver. This b_r value of -6 ns and b_s value obtained from Centre for Orbit Determination (CODE) are removed from the STEC to obtain $STEC_l$ (Eq.1) (Astronomisches Institut, 2016; GNSS Calendar and Utility, 2016). Both STEC and $STEC_l$ of PRN16 and PRN22 are shown in Figure 2 and Figure 3 respectively. It is found that the STEC values are varying from -10.483 to -6.205 TECU for PRN16 (Fig.2) and -16.457 to -14.761 TECU for PRN22 (Figure 3). After removing the receiver bias, the STEC is found to be varying between 6.616 to 10.894 TECU for PRN16 and 0.642 to 2.338 TECU for PRN22. The Figure 4 shows the results of receiver bias estimation of GPStation6 receiver on 13th and 14th February 2017. Standard deviation of VTEC due to two PRNS, PRN2 and PRN12 are visible during 22.9 Hrs. of 13th Feb to 05 Hrs. LT of 14th Feb is shown in Figure 4 for receiver bias variation of -30 ns to +30 ns. Additionally, it is found from the Figure 4 that the minimum standard deviation of VTEC (45.746 TECU) occurs at receiver bias of -11ns. Therefore, -11ns is considered as receiver bias b_r for the GPStation6 receiver. This (b_r) value of -11 ns and b_s value obtained from CODE are removed from the STEC to obtain $STEC_l$ (Eq.1) Both STEC and $STEC_l$ of PRN2 and PRN12 are shown in Figure 5 and Figure 6 respectively. It is found that the STEC values are varying from -17.446 to -11.831 TECU for PRN2 (Figure 5), and from Figure 6 STEC values are varying from -21.607 to -17.362 TECU for PRN12. After removing the receiver bias, the STEC is found to be varying between 13.903 to 19.518 TECU for PRN2 and for 13.987 to 9.742 TECU PRN12. FRB method is used for estimating the initial value of the receiver bias. For estimation of receiver bias using FRB method, only night time data is considered since TEC variations are relatively small and constant during the night time.

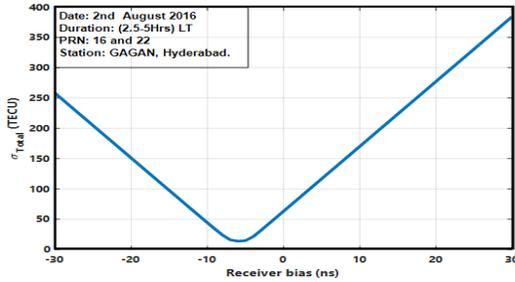


Figure1. Variation of Receiver bias and total standard deviation of VTEC of estimated receiver bias for GPS receiver (GSV4004B)

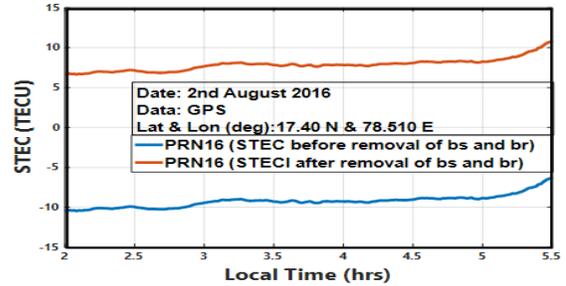


Figure 2. Variation of Local Time and STEC before and after removal of

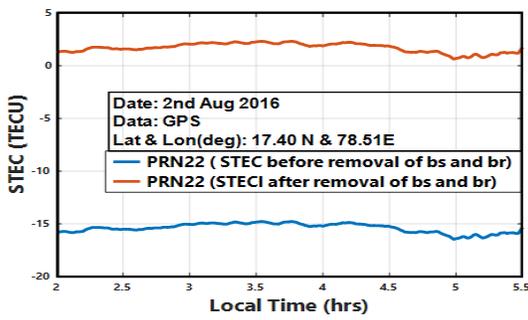


Figure 3. Variation of Local Time and STEC before and after removal of Receiver bias for GPS receiver (GSV4004B) (PRN22)

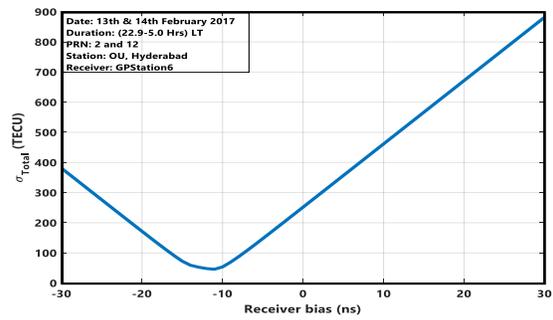


Figure 4. Variation of Receiver bias and total standard deviation of VTEC of estimated receiver bias for GPStation6 Receiver

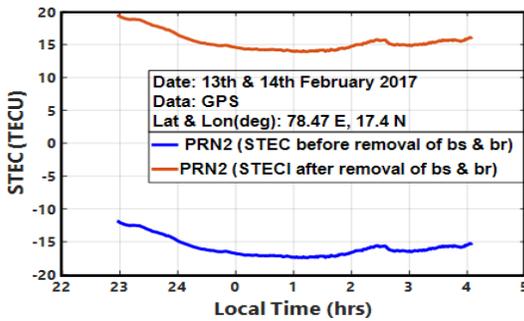


Figure 5. Variation of Local Time and STEC before and after removal of Receiver bias for GPStation6 Receive (PRN 2)

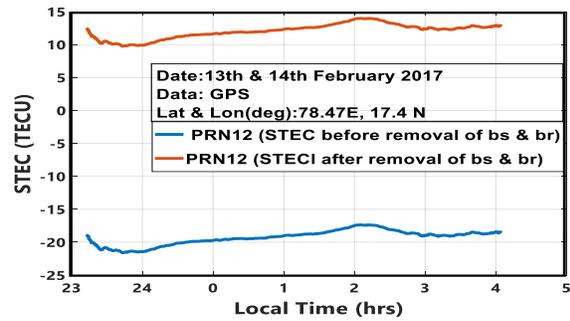


Figure 6. Variation of Local Time and STEC before and after removal of Receiver bias for GPStation6 Receive (PRN 12)



CONCLUSIONS

Precise estimation of ionospheric TEC plays an important role in many GNSS based applications. As receiver instrumental bias introduces an error into the TEC measurements, the estimation and elimination of receiver bias is necessary. In this work, GNSS receiver bias is estimated using FRB method and the estimated bias values are eliminated from the TEC measurements. The estimated receiver bias for GAGAN Hyderabad receiver is -6ns and for GPstation6 receiver is -11ns. After removing the respective receiver bias from the TEC value, it is observed that negative TEC values converted to positive TEC values. It is observed that STEC deviation before and after removal of biases is 17.14 TECU for PRN16 and PRN22. Similarly, for PRN12 and PRN2 deviation is 31.35 TECU. This method is very convenient and simple for estimation of receiver bias and in turn helps in the development of new ionospheric time delay models for single frequency applications of GNSS.

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The Development of Cyber Laboratory Instruction Model under the Theory of Constructivism

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ABSTRACT

The main objective of this study was to develop instructional model based on constructivist theory to enhance knowledge construction abilities of science students. The instructional model was developed based on the principles of constructivist theory. The sample was a group of 26 first year students studying the fundamental of Physics laboratory, the faculty of Science and Technology, Suan Sunandha Rajabhat University. The developed instructional model met the efficient standard criterion of 82.10/80.25, which was higher than the required criterion. The learning achievement scores of posttest were higher than pretest at the 0.01 level of significance. The instructional model was called MARCE Model. The Model consisted of principles, objectives, syntax, and support system. There were 5 steps of syntax which were (1) Motivation, (2) Action, (3) Reflection of Knowledge, (4) Construction of Knowledge, and (5) Evaluation. The students' opinions towards the instruction with MARCE Model overall were found at high level of agreement. On the aspects of the learning environment, the active learning, and finally, the benefits of collaborative learning activities were revealed at high level of agreement respectively.

Keywords: *Constructivist Theory, MARCE*

INTRODUCTION

Physics is one of the subjects that science students have to study. It is the science of workings and limitations of nature's laws, and is the oldest academic discipline. Physics is the basic knowledge for understanding the complexities of modern technology, and essential for technological advancement of a nation. However, many studies have found that students' difficulty in physics attributed to various factors. For example, in a study in USA, three categories of factors were identified: factors related to the students that they are capable of controlling, factors related to the course, and factors inherent in the nature of physics (Ornek, Robinson, & Haugan, 2008). There is one question of the teachers “How to teach Physics for easily understanding?” The goal is to find effective teaching methods according to the requirements of the teaching and learning for the 21st century. The method that answers the question is teaching by focusing on the constructivist learning theory. Constructivism has been intensively studied for more than a decade by researchers of science education and mathematics education (Davis, Maher, & Noddings, 1990). This theory refers to the idea that learners construct knowledge for themselves (each learner individually and socially), and constructs meaning as he or she learns. Thus, to start the research from this point of view, the aims of the research were (1) to find appropriate teaching and learning methods base on Constructivist theory, and (2) to experiment and find out the effectiveness of teaching and learning method.



METHODOLOGY

1.1 Sample

The case study of this research was Fundamental Physics Laboratory subject which using a cyber-laboratory as a physics laboratory. The population of this study consisted of students who enrolled in a basic Physics Laboratory course (PHY 1312) at the Faculty of Science and Technology, Suan Sunandha Rajabhat University, Thailand of the academic year 2016. Samples were students who enrolled in subject PHY 1312 in 1 class. It was a specific group that the researcher was responsible for teaching.

1.2 Variable

Independent variable was the instructional model base on Constructivist theory. In this research, MARCE model was used as well. The process of learning used as guideline of teaching and learning are 1. Motivation (M), 2. Action (A), 3. Reflection of knowledge (R), 4. Construction of knowledge (C), and 5. Evaluation (E).

Dependent variable were 1. the effectiveness of educational base on 80/80 (Performance criteria for 80/80, the first 80 number means the percentage of the average of the exercises at the end of the trial between the students' learning laboratory using the cyber laboratory, the latter 80 refers to the percentage of the average of the conceptual test after the end of experiment using the cyber laboratory, and 2. the opinion of the students toward the learning model.

1.3 Measuring instruments

- Paper test of physics concepts on a topic: Newton's second laws of motion along a straight line. The 3 physics concepts were concept of forces acting on the object, concept of the relationship between the net force and acceleration, and concept of the relationship between mass and net force.
- Questionnaires used to measure the students' opinions toward the learning model including 3 topics:
 - Learning environment
 - Learning activities
 - The benefits of collaborative learning activities

This study was conducted by the researcher in order to investigate a single group of students. The one group pre-test and post-test design is shown in Table 1.

Table 1.
The One Group Pre-test and Post-test Design

Group	Pre-test	Experiment	Post-test
(.) E	T ₁	X	T ₂

1.4 Data collection

The researchers conducted data collection as following.

- Students did a pre-test on the concepts of Physics.
- After the pre-test, students carried out an experiment using the cyber laboratory along with the process of MARCE model. After the process of learning, students did the exercise then it was the first 80 points of the evaluation which was used in finding efficiency score for learning.



- After all students had completed the physics experiment, they completed a post-test as to investigate the efficiency of learning.
- Students did the questionnaire to respond to the opinion with the learning process of MARCE model.

1.5 Data analysis

Table 2.

A Comparison of the Percentage of the Average Score between the Exercises and Post-test

Score	Efficiency of MARCE model		Criteria of Evaluation
	E ₁ (%)	E ₂ (%)	
Exercise	82.10		80
Paper test (post-test)		80.25	80

Table 3.

Comparison of the Mean Score between Pre-test and Post-test

Score	Students (N)	Full score	\bar{X}	S.D.	t	Sig (2 tail)
Pre - learning achievement	26	15	7.58	1.88	12.53	.000*
Post - learning achievement	26	15	12.04	1.37		

*Significant level 0.01

Table 4.

Students 'Opinions toward the MARCE Model

	Learning environment	Learning activity	The benefits of collaborative learning activities.
Mean	4.5846	4.4538	4.2231
N	130	130	130
Std. Deviation	.69086	.72723	.83773
Sum	596.00	579.00	549.00

Table 4 shows the students' opinion toward the MARCE model in each topic from highest level to lowest level as following: The learning environment, the active learning, and the benefits of collaborative learning activities, respectively.



Table 5.
The Students ‘Opinions toward the Lists of Learning Environment

	The learning activities are fun and enjoyable	The learning activities cause students eager to learn	The learning activities make students interested to participate in the course.	The learning activities encourage learners to share a comment.	The learning activities encourage students to critical thinking.
Mean	4.4231	4.7692	4.6154	4.3846	4.7308
N	26	26	26	26	26
Std. Deviation	.70274	.42967	.85215	.80384	.53349

Tables 5 shows the students’ opinion toward the lists of learning environment from highest to lowest as following:

1. The learning activities cause students eager to learn.
2. The learning activities encourage students to critical thinking.
3. The learning activities make students interested to participate in the course.
4. The learning activities are fun and enjoyable.
5. The learning activities encourage learners to make a comment.

Table 6.
Students ‘Opinions toward the Lists of Learning Activities

	It makes a difficult subject easier for understanding.	It makes a co-operate learning and support to exchange an idea to get a solution of problem.	It promotes knowledge and facilitate self-learning.	It manages the physics content suitably and smoothly.	It encourages students to critical thinking and solve the problem step by step.
Mean	4.46	4.5385	4.1538	4.5769	4.5385
N	26	26	26	26	26
Std. Deviation	.761	.76057	.78446	.64331	.64689
Sum	116	118.00	108.00	119.00	118.00

Table 6 shows students’ opinion toward the lists of learning activities from highest to lowest as following:

1. It manages the physics content suitably and smoothly.
2. It makes a co-operate learning and support to exchange an idea to get a solution of problem.
3. It promotes knowledge and facilitates self-learning.
4. It encourages students to critical thinking, and solves the problem step by step.
5. It makes a difficult subject easier for understanding.



Table 7.
Students ‘Opinions toward the Lists of the Benefits of Collaborative Learning Activities

	Gain knowledge and be able to summarize the important content.	Confident and assertive.	Collaborative with learning to solve problem.	Practical to critically think and solve a problem in sequenced.	Get together to exchange ideas and find the solution of problem.
Mean	4.3462	4.2308	4.0769	4.3462	4.1154
N	26	26	26	26	26
Std. Deviation	.74524	.90808	.93480	.79711	.81618
Sum	113.00	110.00	106.00	113.00	107.00

Table 7 shows students’ opinions toward the lists of collaborative learning activities from highest to lowest as following:

1. Gain knowledge and be able to summarize the important content as well as practical to critically think and solve a problem in sequenced.
2. Confident and assertive.
3. Get together to exchange ideas and find the solution of problem.
4. Collaborative with learning to solve problem.

CONCLUSION AND DISCUSSION

The efficiency of the instructional model based on the Constructivist theory to enhance the knowledge-based ability of science students were 82.10 / 80.25 compared to 80/80. It appears that the instructional model was effective which met the defined criteria. This means that the research hypothesis was accepted by learners. The result is due to the following reasons: the teaching model is systematically constructed in accordance with the principles, concepts, theory involved. Moreover, it was examined by the experts in the field of teaching and evaluation. All of instruments of research were improved and edited to be correct and suitable for practical purposes. In addition, the teaching style was more effective than the 80/80 criterion and the learning achievement before and after learning. The students’ post-test achievements on learning were significantly higher than their pre-test at the 0.01 level. Additionally, the students’ opinions towards the instruction with MARCE Model were at a high level of agreement. On the aspects learning, the learning environment, the active learning, and finally, the benefits of collaborative learning activities were revealed at a high level of agreement, respectively. The advantage of the result of the study based on the constructivist classroom shows that students work primarily in groups and acquire knowledge interactively and dynamically since this study greatly focuses and emphasizes on social and communication skills, as well as collaboration and exchanging of ideas. According to the study of Erinosh (2013), it was found that students do not like to ask for help from their teacher or answer questions in class. It is noteworthy that teachers must emphasize active teaching methods (e.g., group work, cooperative learning, and presentations), and make friendly classroom environment that can initiate quality interactions between the students and the teacher. Furthermore, this study comply with educators



who agree that students learn best in what interests them, and meaningful content is better learned and retained than less meaningful content (Smith, 2007; Sahin & Yagbasan, 2012). Thus, the MARCE model can be used for teaching cyber laboratory of physics to science students.

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The Flipped Classroom in Physics1 of 1st Year Students in Applied Physics

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ABSTRACT

This research aimed to investigate the ability and attitude towards physics subject of 1st year students in Applied Physics, Suan Sunandha Rajabhat University. Questionnaire was proposed to assess students’ attitude towards physics and their suggestion for improving physics class. The participants of the study were 1st year students of academic year 2018 enrolling in Applied Physics 1, Suan Sunandha Rajabhat University, Bangkok. The research finding reveals that the overall score from questionnaire of each student is high which can be divided into categories as following. (1) The average of students’ competency in physics subject found at moderate level, (2) the average score of creativity in physics is very high, and (3) the average score of application in physics is very high. Additionally, in aspect of each student, the results show that the high level of 6 students and the moderate level of 5 students indicated that the first year students in Physics had satisfactory results. Besides aspect of students, the achievement score was found at a high level compared to the standard set. Moreover, the results show the students’ attitude that most students prefer learning through practice and do not like physics when it comes to advance theories without teaching of basic principles. Furthermore, students suggested that (1) the content of theoretical subjects should correspond to the syllabus, (2) the practice should not be too hard for students to calculate, (3) instructors should interact with students, (4) basic knowledge should be taught before going deeper in content, (5) theoretical thinking can lead to learning and thinking, (6) practice is to bring understanding and learning to everyday life, (7) theory can encourage a lot of students, (8) do not put too much content in each class, (9) the content of the course should be described in a practical way, (10) instructors should ask students in class to make them interested in contents, and (11) in the lesson, instructor should demonstrate the practice.

Keywords: *Reversing Learning, Learning Achievement, Attitude towards Physics, Theory of Learning in Physics 1*

INTRODUCTION

Physics is a very important subject since it is the foundation of science learning in other fields. However, from the follow-up, there are some of the students who had low academic achievement. Particularly, in physics subject, students must have deep knowledge of the subject to be able to apply it in different contexts. In order to study physics, students have to link their knowledge, and concentrate on their study. If students are not ready, they will not be good enough in learning. The human nature is in society, situations or environments surrounding can affect students' emotion, which affects their learning. It is very difficult for students to be ready to learn simultaneously. In the world of information, there are many types of knowledge that students have to study when there is the time for students to study. The advantage of that is students can fully potentially learn.

Since each person has different learning paths, different time periods, and learning styles, it is better to learn when fully free. The reason that it is good to learn is that when student study, they must go through the process of thinking logically. Students need to contemplate carefully and bring the knowledge they have learned to share



and discuss in the classroom to make it clearer As well as use those knowledge in the applications. In addition, the knowledge can be used to solve problems of the exercises in different situations. For these reasons, the researchers are interested in doing the current study. For Physics 1 of 1st Year Students in Applied Physics, it is important to develop the students’ potential in order to solve the problems of students with low academic achievement.

Research Objectives

1. To evaluate the students’ ability to be proficient, creative in application, and good in problem solving.
2. To study the physics learning achievement of the first year students in the field of applied physics.
3. To study the attitude towards physics of 1st year students of Physics.
4. To provide students with guidance in physics 1.

RESEARCH METHODOLOGY

Population

The population of the study was the first year students of academic year 2016 in Physics, Applied Physics, Suan Sunandha Rajabhat University, Bangkok.

Research Tools

1. Student's ability assessment form of creative application and problem solving.
2. Physical Education Achievement Test 1
3. Attitude Measurement for Physics 1
4. The questionnaire for the students to give the instruction in physics 1

Methods of Research

1. Assign students to read and understand the teaching of physics 1 taught by the instructor.
2. Teach each person the knowledge they have learned. The instructor must make clear the Rubik of the students’ score in order to be accurate and fair.
3. Evaluate students according to the criteria by making a table with the list of students.
4. Once the content has been completed, students take the achievement test in Physics 1.
5. When students completed the content, then students complete a measurement of attitudes towards physics.
6. Provide students with physics instruction.

Data Analysis

1. Assess students' ability by finding the mean of the results and compare them with criteria to interpret.
2. Grade Physics 1 Learning Achievement Compared to Criteria to Interpret.
3. Determine the mean of the attitude toward physics 1 compared to the criterion to interpret.
4. Bring the data to the analysis table to find the common characteristics and characteristics to summarize as a guide to learning physics.



RESEARCH RESULTS

Table 1. Student Assessment Level

People	Each assessment score					\bar{X}	Evaluation level
	Correctness	Creation	Applying	problem-solving	Total		
1	5	7	6	7	25	6.25	Moderate
2	6	5	6	7	24	6.00	Moderate
3	7	8	6	7	28	7.00	High
4	7	8	6	7	28	7.00	High
5	7	5	6	7	25	6.25	Moderate
6	7	7	7	7	28	7.00	High
7	5	8	6	7	26	6.50	High
8	6	8	6	7	27	6.75	High
9	5	8	6	7	26	6.50	High
10	5	5	6	7	23	5.75	Moderate
11	5	5	6	7	23	5.75	Moderate
Total	65	74	67	77	283	6.43	High
\bar{X}	5.90	6.72	6.09	7.00			
Evaluation level	Moderate	High	Moderate	High			

Individual Assessment

The average score of the accuracy of the first year students in Physics was at a moderate level (= 5.9).

The average level of creativity of the first year students in physics was at a high level (= 6.72).

The average of the applications of the first year students in Physics was at a moderate level (= 6.09).

The average score of solving problems of 1st year students in Physics was at a high level (= 7.00).

Evaluate Every Aspect of Each Person

The results showed that the high level of 6 students and the moderate level of 5 students indicated that the first year students learning Physics had satisfactory results.

Average Rating

The results of the evaluation were very high (= 6.43).



Table 2. Student Assessment Level

People	Score on achievement in Physics 1	Achievement Level
1	70	Good
2	86	Excellent
3	86	Excellent
4	82	Excellent
5	75	Good
6	87	Excellent
7	75	Good
8	75	Good
9	79	Good
10	76	Good
11	74	Good
Average	78.63	Good

Table 3. Attitude towards physics

No	Issues	Level Comments	
1	Physics is a worthwhile subject.	4.81	Strongly agree
2	Physics always brings in new knowledge.	4.81	Strongly agree
3	Physics is a challenging subject to prove and research to gain new knowledge.	4.9	Strongly agree
4	Physics helps people think in a systematic way.	4.36	Strongly agree
5	Physics is a course that helps learners to solve problems in the right way.	4.36	Strongly agree
6	Physics is a subject that helps people understand the natural phenomenon.	4.45	Strongly agree
7	Physics is a subject that encourages reasoning.	4.54	Strongly agree
8	Physics is a boring subject.	3.81	Agree
9	Physics is a difficult subject to learn.	4.00	Agree
10	Physics is a subject that cannot be used in everyday life.	1.54	Strongly disagree
11	Physics is a subject that everyone should study.	4.63	Strongly agree
12	The progress of physics makes people enthusiastic.	4.00	Agree
13	The progress of education in physics makes the country prosper.	4.36	Strongly agree



14	The advancement of physics saves time and money.	3.63	Agree
15	Advances physics help the world prosper in the future.	4.36	Strongly agree
16	If I was the leader of the country. I will promote research and research in physics.	4.18	Agree
17	When more physics developed, it will cause problems for the unemployed.	3.27	Moderate
18	When physics grows, mankind will not be known.	3.90	Agree
19	The advancement of physics makes the natural resources destroyed.	3.54	Agree
20	Physics focuses on developing objects without regard to mental development.	3.63	Agree
21	If I have the opportunity to study, I will choose to study in physics.	4.18	Agree
22	When there is a problem in learning physics, I will ask the teacher for the correct understanding.	4.36	Strongly agree
23	I like to spend my free time studying physics.	3.09	Moderate
24	I often go back to study physics more after studying with a teacher.	3.18	Moderate
25	Talking about physics is boring.	3.63	Agree
26	Advance physics is not interesting.	4.18	Agree
27	It's waste of time to invite lecturers to lecture on physics.	4.36	Strongly agree
28	I like doing other activities rather than physics.	3.9	Agree

Table of Attitudes toward Physics (continue)

No	Issues	Level	Comments
29	I do not like doing experiments in physics.	4.18	Agree
30	I feel uncomfortable when it comes to studying physics.	4.27	Strongly agree
31	I like watching movies or television, which is a documentary about physics.	2.72	Moderate
32	I always keep up with the progress of physics.	2.72	Moderate
33	I like listening to lectures of physics.	3.27	Moderate
34	School libraries should have lots of physics documents.	4.27	Strongly agree
35	I like to read articles about physics in newspapers.	3.36	Moderate
36	I'm interested in physics.	4.00	Agree
37	I am tired of visiting physics exhibitions.	2.27	Disagree
38	I do not like reading books about physics.	2.18	Disagree
39	I do not like listening to radio shows and watching television programs of physics.	2.00	Disagree
40	I'm not interested in keeping up with the latest advances physics.	1.81	Strongly disagree
41	I like to research, read and read physics texts.	3.45	Agree
42	If the school organizes a competition to answer a problem of physics. I will attend.	3.45	Agree



43	If there is a physics exhibition in the school, I would be happy to help.	4.54	Agree
44	I often use the knowledge of physics to solve everyday problems.	4.00	Agree
45	I would like to visit the show of progress in physics.	4.15	Agree
46	I campaigned for people to apply their knowledge in physics to local development.	4.09	Agree
47	I like to campaign for most people to see the importance of physics.	3.90	Agree
48	I learned the physics but the teacher on explained, never researched further.	2.18	Disagree
49	I never used physics knowledge to solve everyday problems.	4.00	Agree
50	If I was assigned to investigate physics, I would try to avoid it.	1.45	Strongly disagree

The First Year Student Table of Attitude toward Physics Medium How to learn Physics

Table 4 Analytical tables for physics learning

People	The content of theoretical subjects is consistent with the study.	Engage with instructors.	Theory is just enough to understand. Do not go deep	It is easy to calculate.	Theory can be derived from the study of thought and analysis.	The practice is to bring understanding and learning to daily life.	The theory can encourage a lot of students.	Do not put too much content in each class.	The content of the course is described in a practical way.	Physics is useful	In the lessons, instructors need to demonstrate the practice.	Asking students to think can make the students interested.	Use the video in teaching.	I want the instructor to demonstrate.
1	✓	✓												
2	✓													
3			✓	✓										
4					✓	✓								
5							✓	✓	✓	✓				
6	✓			✓										
7	✓			✓							✓	✓		
8			✓										✓	
9	✓									✓				✓
10	✓													
11	✓									✓				
Total	7	1	2	3	1	1	1	1	1	3	1	1	1	1



Suggested Physics Classes

1. The content of theoretical subjects corresponds to the syllabus.
2. The practice should not be too hard for students to calculate.
3. Instructors interact with students.
4. Basic knowledge is taught before going deeper in content.
5. Theoretical thinking can lead to learning and thinking.
6. Practice for understanding and learning that is involved in everyday life.
7. Theory is taught to encourage students.
8. Do not put too much content in each class.
9. The content of the course is described in a practical way.
10. The knowledge is useful.
11. In the lesson, I want the instructor to demonstrate the practice.
12. Asking students to think can make the students interested.

Student Evaluation

Assessing the Overall Picture of Each Person

The average score of the competency of the first year students in Physics was at moderate level.
 The average score of creativity of the first year students in physics was at very high level.
 The average score of the application of the first year students in Physics was at a moderate level.
 The overall average score of solving problems of the first year students in physics was at very high level.

Evaluation of Every Aspect of Each Person

The results showed that the high level of 6 students and the moderate level of 5 students indicated that the first year students in Physics had satisfactory results.

Evaluation of Aspect of Everyone's Average Score

The results of the assessment are very high.

Evaluation of Achievement in Physics 1

The achievement scores were at a high level compared to the standard set.

Attitude towards Physics

1st year students in Physics showed attitude toward Physics that they did not like to study physics at the beginning because of the experience and teaching that was not good. Students had poor perception and feeling of boredom. In order to change the attitude, it needs some time since students have positive attitude towards physics at moderate level.

The physics student's suggestions

1. The content of theoretical subjects corresponds to the syllabus.
2. The practice should not be too hard for students to calculate.
3. Instructors should interact with students.
4. Basic knowledge should be taught before going deeper in content.
5. Theoretical thinking can lead to learning and thinking.
6. Practice is to bring understanding and learning to everyday life.
7. Theory can encourage a lot of students.
8. Do not put too much content in each class.



9. The content of the course should be described in a practical way.
10. Instructors should ask students in class to make them interested in contents.
11. In the lesson, instructor should demonstrate the practice.

DISCUSSION

Student Evaluation

Individual assessment

The results of the study show that the average score of the competency of the first year students in Physics is at a moderate level, the average score of creativity of the first year students in physics is at very high level,

The average score of the application of the first year students in Physics is at a moderate level, and the overall average score of solving problems of the first year students in physics is at very high.

This is due to the following reasons

1. The competency of the first year students in physics was at a moderate level because students don't have much experience in researching. Students with bad experience and attitudes towards physics make learning and perception less effective.
2. The creativity of the first year students in physics is found at a high level because students prepared to study and prepare to link knowledge in the content with their knowledge. Since teachers would evaluate students' creativity, the students well prepared for the evaluation. Students have the opportunity to master their own ability to create creative thinking at a very high level.
3. The application of the first year students in physics is at a moderate level. This is due to the fact that the student has sufficient knowledge at a moderate level. However, students can not apply the knowledge effectively. The ability to transfer knowledge from learning to problem solving is not good or at a moderate level.
4. The problem solving of the first year students in Physics is at a high level because the students can solve the problem systematically. Systematic thinking leads to problem solving skills.

Evaluate Every Aspect of Each Person

The results showed that the high level of 6 students and the moderate level of 5 students indicated that the first year students in Physics had satisfactory results. This is because each person has different views and experience, resulting in different assessment results.

Average Rating

The results of the assessment are found at very high level because students have different experience that there are some students have good foundations, while some do not.

Achievement in Physics 1

The achievement score was found at a high level compared to the standard set because this test uses content derived from instructional techniques that focus on teaching the learner to focus on the full interest. Students can critically think, and focus more on knowledge resulting in a high level of academic achievement.

Attitude towards Physics

Attitude toward Physics of 1st year students in Physics is not good because they are no good at physics. It is difficult to see, but it has been linked to the belief that the nature of physics is quite difficult, so that it makes students have negative attitude towards the subject. Negative attitude needs to be changed into positive attitude in order to lead students to better learning resulting in more knowledge.



SUGGESIONS FOR PHYSICS CLASSES

The content of theoretical subjects is consistent with the study. It is found that students opine in the similar ways as following: They need the exercise not too hard to calculate. They the instructor interacts and discusses with students. There is no need to go deep into the theory of what can be learned from the thinking and analysis. The practice should bring understanding and learning into daily life. Additionally, teachers should encourage students to practice and do not put too much content in each class. The content of the course should be described in a practical way. Asking students and making discussion in the lesson as well as demonstrating the practice can truly help students in learning physics.

The results of the study indicate that students cannot learn while studying because they cannot link what they have learned with their knowledge. It is impossible to link the knowledge together if they do not understand the theoretical subjects in accordance with the study. Students are familiar with theories and solving problems in practice; therefore, this is a great way to get started. By nature of the new generation students, they are not patient in learning since they do not like to study too deep into theories. They prefer practice and analysis since they proposed that theoretical models can be applied to the study of thought and analysis. It is suggested that the practice should lead to understanding and learning into the daily life. However, the results of the study shows that some students study physics without clear goal since they do not see the benefits of learning it and cannot apply it in situations. As a result, they are not enthusiastic to learn and do not want to learn deep into advance theories.

Students cannot control themselves to have learning disciplines while studying. They do not practice to be patient while learning, so the teachers may need to take action to change their learning behavior. Additionally, students do not want to learn too much in class especially when the teacher put much of information into the lesson since the students want to learn by doing or researching more than focusing on theory in class. Moreover, the class should be the place for idea changing and discussing of the topics students interested. The teacher should offer opportunity for students to learn by self-study instruction, and demonstrate the practice instead of focusing on text. This will make the classroom valuable for students and result in encouragement of students' learning.

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EFFECTIVENESS OF ELDERLY CAREGIVER TRAINING PROGRAM

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ABSTRACT

Abstract—This research was a quasi-experimental research that aimed to 1) study the results of the Elderly Caregiver Training Program, and 2) comprehend the attitudes of participants trained in the Elderly Caregiver Program towards the elderly person. The samples used in the research were 30 elderly caregivers who work in Samut Songkhram Province. Experimental method was designed by One Group Pre and Post-test Design. The research tools were divided into 3 parts as follows: 1) 80 hours training course for elderly caregiver, 2) Form of Knowledge-Attitude-Practice (KAP), and 3) Elderly Caregiver Attitude Survey. Data collections were recorded in three periods of pre-training (before training), after training and repeat after 2 weeks training. For Pre-training, the elderly caregivers had to perform the Form of KAP, then continually train 80 hours length. After 80 hours training, the elderly caregivers had to promptly complete the Post-test of KAP, and repeat again in the next 2 weeks. Statistics analysis employed in this research was the percentage, mean, standard deviation and Pair t-test. The results of this research were identified as follows. 1.) 73.4% of the elderly caregivers before training had knowledge about the elderly care in the moderate level. However, after training, the scores of Post-test were informed that 100% of all participants had been reached to the high level. Repeatedly, 53.3% of the elderly caregivers had scores of repeated Post-test in the high level. 2.) The differences of score between pre-test and post-test after training were statistically significant at .01 level in accordance with pre-test compared with post-test after 2 weeks. 3.) The differences of attitude of the elderly caregivers towards the elderly person between pre-training and post-training were statistically significant at .01 level.

Keywords— Effectiveness, Elderly Caregiver, Training Program



INTRODUCTION

Data indicated that population in the developed countries such as European Union and North America have transformed to aging-society [1]. In the 2000, the number of elderly person in Thailand was reaching to 9.6 percent of all population which was remarked as the top ranking in Southeast Asia. This number had been incessantly increased to 11.5 percent in 2010 and now Thailand has reached to the aging-society already. Expectedly, in the 2025, the number of elderly person will be touched 19.1 percent and 26.4 percent by 2025. These information implied that aging-society in Thailand has been faster transformed faster than other western countries in the world [2]. A study of Health Quality life of Elderly person in Samut Songkhram Province of Thailand also informed the numbers of elderly person who were stayed alone without relatives and only two together with their own couples have been increased. 104 of all 415 elderly person responded that they stayed with closers just only two persons in the family. This was accounted for 25.1 percent and 33 respondents kept stay alone in their houses, accounted for 8.0 percent [3]. This problem has been come from the changes of society and world where most of successions of those elderly person in the society have to keep their work hard and earn money so that they have not much times to take care their parents and elderly person in the family [4]. This transformation has effected to their behaviors which the private caregivers have been hired to look after elderly person in the present situation. The higher amount of elderly caregiver hires, the more significant of Elderly Care Program at College of Allied Health Sciences, Suan Sunandha Rajabhat University. Thus, the Department of Elderly Care has initiated the “80 hours Elderly Caregiver Training Program” in order to train the caregivers in Thai society to be better elderly care practitioners. The author was interested to study the results of the Elderly Caregiver Training Program in order to develop this course to be the elderly caregiver training prototype and to promote the health promotion in Thai society.

LITERATURE REVIEWS

Thailand has been presently transformed to the aging-society because of the increasing number of elderly person in Thai society, therefore Thailand raises the topic of elderly care as one of the significant working issues. Thai government has initiated the working plan for elderly person in accordance with the National Strategy (2017-2036) under the umbrella of the National Economic and Social Development Plan No. 12 (2017-2021) which were consisted of the plan on the elderly. This components were six main pillars; one of those has been focused on the human development; to promote the well-beings to all persons in the society and lifelong learning, to enhance the education for children, and to support the good life of elderly person [5]. In accordance with the 2nd National Plan on The Elderly (2002-2021) eds. 2009, this plan has divided into 5 strategies; 1) strategy on readiness preparation of the people for their quality ageing, 2) strategy on the elderly promotion and development, 3) strategy on the social safeguards for the elderly, 4) strategy on management of developing the national comprehensive system for undertakings and developing the personnel for the elderly involving missions, and 5) strategy on processing, upgrading and disseminating knowledge on the elderly and the national monitoring of implementation of National Plan for the Elderly [6].

Furthermore, General Prayuth Chan-o-cha, the prime minister of Thailand announced the Thailand Reforming Plan and the fundamental rights and freedoms of Thai people on April 6, 2018. The constitution laws state to health services as follows. “Section 47. A person shall have the right to receive public health services provided by the State. An indigent person shall have the right to receive public health services provided by the State free of charge as provided by law. A person shall have the right to the protection and eradication of harmful contagious diseases by the State free of charge as provided by law.” Also, “Section 48. The rights of a mother during the period prior to and after giving birth shall be protected and assisted as provided by law. A person who is over sixty years of age and has insufficient income for subsistence and an indigent person shall have the right to receive appropriate aids from the State as provided by law.” Besides, “Section 71. The State should strengthen the family unit which is an important basic element of society, provide an appropriate accommodation, promote and develop the enhancement of health in order to enable people to have good health and strong mind, as well as promote and develop excellence in sports and to maximize the benefit for the people. The State should promote and develop



human resources to be good citizens with higher quality and abilities. The State should provide assistance to children, youth, women, the elderly, persons with disabilities, indigent persons and underprivileged persons to be able to have a quality living, and shall protect such persons from violence or unfair treatment, as well as provide treatment, rehabilitation and remedies to such injure persons. In allocating the budget, the State shall take into account the different necessities and needs with respect to genders, ages and conditions of persons to ensure fairness” [7].

However, a person who careers as elderly caregiver must qualify the professional qualification on elderly care such as basic knowledge, skill and professional capacity according to the Professional Qualification Standard for Elderly Caregivers in the Royal Thai Government Gazette specified by the Thailand Professional Qualification Institute (Public Organization), issued on August 10, 2016 [8] and the rules of health services for the elderly specified by the Department of Old Persons, Thailand. The rules of health services for the elderly declared on the qualification of health receivers, health service specification, and rules and conditions [9]. In terms of College of Allied Health Sciences, Suan Sunandha Rajabhat University, the university has organized the Program in Elderly Care and promoted this course to be Niche Guru Program of the university. Besides, the university has also conducted the short course program especially for elderly caregivers whom interested in elderly care. This research has concentrated to evaluate the Elderly Caregiver Training Program (80 hours) which has consisted of 40 hours coursework and 40 hours workshops of 1) structure of Thai population 2) diseases and health problems in elderly person, 3) health care directions and restoration in elderly person, 4) emergency cases cause in elderly person and the first aids, 5) health promotion for elderly person, 6) theory and concept of elderly care, 7) folk wisdom and elderly care, 8) rights of elderly person following Thai constitution and rules of laws, 9) roles and ethics of elderly caregivers, and 10) workshop. The workshop mainly aimed to exchange the elderly caregivers’ experiences among participants, to practice, and to promote the positive attitude towards the elderly person and elderly care [10]. However, according to the program evaluation, the previous literatures stated that there were five popular models used in the program evaluation: 1) objective based model, 2) responsive based model, 3) specialist based model, 4) decision-oriented evaluation model, and 5) strategic based model which follows either program’s goals, formative evaluation, or hypothesis [11]. Attitude assessment uses the attitude survey which is to prove the human feeling towards human, things, or other attitudes. Attitude assessment is one of the marketing tools that a marketing planner will refer to analyze the consumer’s behavior because attitude will induce person to have positive or negative perception to the products. However, in this regards, the attitude towards the elderly person is the readiness to act or doing something for the elderly person which it would rather be positive than negative [12]. Attitude consists of three components of 1) cognitive component, 2) affective component, and 3) conative component or emotional behavior [13].

OBJECTIVES

Purposes of this research were as follows.

1. To study the results of the Elderly Caregiver Training Program.
2. To comprehend the attitudes of participants trained in the Elderly Caregiver Program towards the elderly person.

METHODOLOGY

This research was a quasi-experimental research study which was designed by One Group Pre and Post-test Design. Targeted samples were 30 elderly caregivers who applied for the Elderly Caregiver Training Program. Focus area was at College of Allied Health Sciences, Suan Sunandha Rajabhat University, Samut Songkhram Education Center, Samut Songkhram Province, Thailand.

The experimental tools consisted of 1) 80 hours training course for elderly caregiver, 2) Form of Knowledge-Attitude-Practice (KAP), and 3) Elderly Caregiver Attitude Survey. Ahead of training, the elderly



caregivers had to fill out the Form of KAP, follow that, the elderly caregivers had to train 80 hours and promptly check out the post-test of KAP afterwards. Besides, the elderly caregivers had to repeat the post-test of KAP again in the next two weeks.

Statistics such as percentage, mean, standard deviation and Pair t-test were employed in this research.

RESEARCH RESULTS

Finding of this research were as follows.

Table 1
Pre-test scores, Statistics and Knowledge level of the elderly caregivers before training (n = 30)

Score	Amount	Percentage	Knowledge level
21-30	7	23.3	Good
11-20	22	73.4	Fair
1-10	1	3.3	Poor
Total	30	100.0	

Table 1 showed that 22 of all elderly caregivers got pre-test score among 11-20 points, accounted for 73.4 percent which were implied that they had possessed fair knowledge about elderly care before training. Besides, 7 of all elderly caregivers got pre-test score among 21-30 points, accounted for 23.3 percent. This means that before training some elderly caregivers had possessed good knowledge about elderly care. One of all got less score of pre-test at 1-10 points, accounted for 3.3 percent which was implied that this caregivers had possessed poor knowledge about elderly care before training.

Table 2
Post-test scores, Statistics and Knowledge level of the elderly caregivers after training (n = 30)

Score	Amount	Percentage	Knowledge level
21-30	30	100.0	Good
11-20	0	0	Fair
1-10	0	0.0	Poor
Total	30	100.0	

From table 2, post-test scores, statistics and knowledge level of the elderly caregivers after training showed that 100 percent of all elderly caregivers who participated in Elderly Care Training Program had possessed good knowledge in accordance with post-test scores can be reached to 21-30 points.



Table 3

Repeat Post-test scores, Statistics and Knowledge level of the elderly caregivers after training 2 weeks (n = 30)

Score	Amount	Percentage	Knowledge level
21-30	16	53.3	Good
11-20	14	46.7	Fair
1-10	0	0.0	Poor
Total	30	100.0	

From table 3, repeated post-test scores, statistics and knowledge level of the elderly caregivers after training 2 weeks showed two different groups that 16 of all elderly caregivers who succeeded in Elderly Care Training Program had possessed good knowledge in accordance with repeated post-test scores can be reached to 21-30 points, accounted for 53.3 percent. However, less of all elderly caregivers had possessed fair knowledge with regard to 11.20 points, accounted for 46.7 percent.

Table 4

Comparison on Pre-test, Post-test, and Repeated Post-test after 2 weeks (n=30)

Average score	Amount	\bar{x}	S.D.	t	Sig
Pre-test vs. Post-test	30	-12.6	2.8	-24.7	000.*
Pre-test vs. Repeated Post-test after 2 weeks	30	-7.8	2.3	-19.0	*000.
Post-test vs. Repeated Post-test after 2 weeks	30	4.8	1.9	13.8	*000.

*p< .01

From table 4, the average scores of elderly caregivers who participated in the Elderly Caregiver Training Program between before training and after training were -12.6, standard deviation (S.D) was 2.8, and T-test result was -24.7 at significant level .01. In additions, the average scores of pre-test and repeated post-test after training 2 weeks were -7.8, standard deviation (S.D) was 2.3, and t-test result was -19.0 at significant level .01. Besides, the average scores of post-test and repeated post-test after training 2 weeks were 4.8, standard deviation (S.D) was 1.9, and t-test result was 13.8 at significant level .01. These implied that before training and after training, the elderly caregivers had possessed knowledge about elderly care significantly.

Table 5

Comparison on elderly caregivers' attitude towards elderly person before training with after training (n=30)

Attitude	Amount	\bar{x}	S.D.	t	Sig
Attitude towards elderly person before training	30	-0.1	0.2	-3.9	.001*
Attitude towards elderly person after training	30				

*p< .01



Table 5 indicated the attitude of elderly caregivers towards elderly person before training significantly differed from after training in accordance with average score at 0.1, standard deviation at 0.2, and t-test result at -3.9.

Table 6
Comparison on attitude towards elderly person before training with after training (n=30)

Attitude	Amount	\bar{x}	S.D.	t	Sig
Elderly person is a valuable person	30	-1.2	0.4	-16.8	.000*
Elderly Caregiver Training Program is necessary for yourself and family	30	-0.7	0.5	-6.7	.000*
Elderly care is boring	30	1.4	0.7	11.2	.000*
Elderly person is fussy and difficult to understand	30	1.2	0.5	12.0	.000*
Elderly caregiver is an high occupation and earn high salary	30	-1.0	0.5	-10.8	.000*
Joining the Elderly Caregiver Training Program can let you have new friends	30	-1.0	0.3	-20.9	.000*
Elderly person who have changed in physical and emotional properties needs more cares from caregivers	30	-1.2	0.4	-16.9	.000*
Elderly person who is bed-wetting should be punished	30	1.1	0.4	14.3	.000*
Elderly person is forgetful so every day shower taking is no needed	30	1.2	0.5	13.4	.000*
Love expression such as hug and good vibes is necessary for elderly person	30	-1.1	0.3	-18.0	.000*

Table 6 showed the attitude results of elderly caregivers towards the elderly person. Results of the first question *elderly person is a valuable person* indicated the average score at -1.2, standard deviation was 0.4 and t-test result was -16.8, respectively. Results of the second question *Elderly Caregiver Training Program is necessary for yourself and family* indicated the average score at -0.7, standard deviation was 0.5 and t-test result was -6.7. Results of the third question *Elderly Care is boring* indicated the average score at 1.4, standard deviation was 0.7 and t-test result was 11.2. Results of the fourth question *Elderly person is fussy and difficult to understand* indicated the average score at 1.2, standard deviation was 0.5 and t-test result was 12.0. Results of the fifth question *Elderly person is fussy and difficult to understand* indicated the average score at -1.0, standard deviation was 0.5 and t-test result was -10.8. Results of the sixth question *Joining the Elderly Caregiver Training Program can let you have new friends* indicated the average score at -1.0, standard deviation was 0.3 and t-test result was -20.9. Results of the seventh question *Elderly person who have changed in physical and emotional properties needs more cares from caregivers* indicated the average score at -1.2, standard deviation was 0.4 and t-test result was -16.9. Results of the eighth question *Elderly person who is bed-wetting should be punished* indicated the average score at 1.1, standard deviation was 0.4 and t-test result was 14.3. Results of the ninth question *Elderly person is forgetful so every day shower taking is no needed* indicated the average score at 1.2, standard deviation was 0.5 and t-test result was 13.4. Finally, results of the tenth question *Love expression such as hug and good vibes is necessary for elderly person* indicated the average score at -1.1, standard deviation was 0.3 and t-test result was -18.0, respectively.



DISCUSSION AND FUTURE RESEARCH

1. Statistics results of the Pre-test, Post-test, and Repeated Post-test after 2 weeks were significantly different at significant level .01. These results were implied that the program participants have been increased in the knowledge of elderly care. The research results were involved in Ananta & Thong-aneek [14] who explored that the village health volunteer in Chawaw Village, Salaphum District, Roi-Et Province of Thailand had been increased in the knowledge after training at significant level ($p < 0.0001$). In addition, in order to encourage the elderly care, this program should develop the program to be the advanced elderly care training program and there should have processes of care planning, coursework and workshop.
2. Average score of attitudes of elderly caregivers towards the elderly person before training and after training was -0.1, standard deviation was 0.2, and t-test result was -3.9 which were significantly different at significant level .01. This implied that the Elderly Caregiver Training Program helped the trainees to have a better attitude towards the elderly person. These results were involved in Wongchawalitkun et al [15] who stated that research respondents had the overall positive attitude towards the elderly person, and the negative attitude on elderly care was decreased. Hence, the promotion on elderly care should be promoted and the elderly caregivers should be continually part of the Elderly Caregiver Training Program. Elderly caregivers should have been developed the attitude toward the elderly person and elderly care and followed the standards on health services initiated by Ministry of Public Health. Besides, the program should have a group working in order to exchange knowledge and experiences among elderly caregivers.

SCOPE OF RESEARCH

1. Target samples of this research were 30 elderly care givers who work in Samut Songkhram Province, Thailand.
2. Area of the research was College of Allied Health Sciences, Suan Sunandha Rajabhat University, Samut Songkhram Education Center, Samut Songkhram Province, Thailand.

EXPECTATION

1. Results of this research will contribute towards the development of Elderly Care Program and Niche Guru Program for Elderly care.
2. Results of this research will facilitate elderly care society where elderly person will be treated with best standard.
3. Results of this research will promote the health promotion and quality of life.

RECOMMENDATION

According to the personal information of the respondents, the author found that 96.7 percent of program participants were female, and 36.6 of all were 40-49 years old who completed the highest education level at primary school level, accounted for 50 percent. Most of them were single and worked as village health volunteer. 46.7 percent of all earned below 5,000 baht per month. 40 percent of all program participant had to take care at least 20 elderly person per elderly caregiver. Most of elderly person under an elderly caregiver were patients, accounted for 63.3 percent. However, 63.3 percent of all were experienced in elderly care. From these numbers, the author recommended that.

1. Those who related should promote and encourage male caregivers to be part of the Elderly Caregiver Training Program in order to understand more in elderly care and avoid the problem of status.
2. Those who related should promote the elderly care and health service education because the education will facilitate the caregivers to be better learners and practitioners. The more direct and indirect experiences, the better elderly person world understanding.
3. Those who related should promote caregivers to earn more money, have well-being and helpfulness to look after the elderly person.
4. There are non-experienced caregivers in the society, therefore they should be encourage to be in the Elderly Caregiver Training Program. Full amount of caregivers in the society should have trained.
5. According to attitude towards the elderly care, the author found that
 - 5.1 Before training: some of elderly caregivers had poor attitudes towards the elderly person and elderly care. Thus, their attitude should be transformed to positive dimension because the poor attitudes of



caregivers may affect the caring behavior.

5.2 After training: some of elderly caregiver had changed a bit towards the elderly person and elderly care. Thus, the program should concentrate more on action and participation as well as plus more on the content and the good case studies.

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EFFECTS OF LEARNING STROKE OF POPULATION GROUP AT RISK IN SAMUTSONGKRAM PROVINCE, THAILAND

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ABSTRACT

A stroke is a dangerous sickness which causes death or disability. However, an appropriate adjustment of health behavior and avoiding risk-factors can reduce a rate of sickness and death, including disability. The purposes of this research were 1) to compare between before and after-stroke learning of the population at risk in Samut Songkram Province and 2) to compare the self-care behavior between before and after-stroke learning of the population at risk in Samut Songkram Province. Sixty persons as a sample used to study were drawn by using a simple random sampling from populations at risk who live in Samut Songkram Province. The data were gathered between December, 2016 and January, 2017 by using an interview based on a questionnaire built by the researchers and a participated-behavioral observation. The statistical techniques used for analyzing were frequency, percentage, mean (\bar{X}) and standard deviation (S.D), the paired t-test, and the content analysis. The research findings are that: 1) There is statistically significance difference at $\alpha .05$ between before and after-stroke learning of the population at risk in Samut Songkram Province ($\bar{X}= 9.67$, S.D. = 3.95 and $\bar{X} = 16.70$, S.D. = 5.35, respectively). 2) There is statistically significance difference at $\alpha .05$ about the self-care behavior between before and after-stroke learning of the population at risk in Samut Songkram Province ($\bar{X} = 2.34$, S.D. = 1.95 and $\bar{X} = 3.42$, S.D. = 1.35, respectively).

Keywords: Stroke, Effects of leaning, Population group at risk

INTRODUCTION

A stroke is a dangerous sickness which causes death or disability. It is a condition where the blood supplied to the brain is disrupted, resulting in oxygen starvation, brain damage and loss of function. It is most frequently caused by a clot in an artery supplying blood to the brain, a situation known as ischemia (World Stroke Organization. (2017). Facts and Figures about Stroke. Retrieved from <https://www.world-stroke.org/component/content/.../84-facts-and-figures-about-stroke>). One out of 6 people worldwide will have a stroke in their lifetime. Fifteen million people all over the world suffer from a stroke each year, and 5.8 million people die from it (World Stroke Organization. (2017). Facts and Figures about Stroke. Retrieved from <https://www.world-stroke.org/component/content/.../84-facts-and-figures-about-stroke>). Past situation suggested that the number of annual deaths climbed to 6.7 million. World Stroke Organization (2017) reported that the stroke caused deaths as the second rank of the world after ischaemic heart disease. Out of the 56.9 million deaths worldwide in 2016, more than half (54%) were due to the top 10 causes. Ischaemic heart disease and stroke are the world’s biggest killers, accounting for a combined 15.2 million deaths in 2016. These diseases have remained the leading causes of death globally in the last 15 years (WHO | Stroke: a global response is needed. Retrieved from www.who.int/bulletin/volumes/94/9/16-181636/en/). The Research Purposes



- 1) To compare between before and after-stroke learning of the population at risk in Samutsongkram Province
- 2) To compare the self-care behavior between before and after-stroke learning of the population at risk in Samutsongkram Province.

In Thailand, a stroke causes death more and more each year. From the report of the Office of Policy and Strategy, Ministry of Public Health, the rates of death caused by stroke per 100,000 people during 2014-2016 were 38.63, 43.28, and 43.54, respectively (Statistical Report of Public Health. (2016). Rate of Sickness and Deaths from Stroke. Retrieved from <https://www.hdcsevice.moph.go.th>).

The stroke becomes an important problem in Thailand even though public health agencies attempt to take care of people who tend to have a stroke. People aged 35 and over as the population at risk are facing a stroke problem. This is because they tend to face risk factors, such as hypertension, diabetes, cholesterol, heart attack, fat or metabolic syndrome and old age. Signs and symptoms of stroke are face drooping, arm weakness, and speech difficulty. Additional signs and symptoms of stroke may include weakness and difficulty of walking, blurred vision, dizziness, headache, confusion, difficulty of speaking, and loss of sensation (14 Warning Signs and Symptoms of Stroke FAST (Mini, TIA). Retrieved from https://www.medicinenet.com/11_signs_and_symptoms_of_stroke/article.htm).

Samutsongkram Province had a population of 194,057 in 2012 (Office of Local Administration, 2012). In 2011, people aged 35 and over had 38,972 (Statistical Report of Public Health. (2018). Rate of Sickness and Deaths from Stroke. Retrieved from <https://www.hdcsevice.moph.go.th>). Many of them had a stroke sickness because of facing the risk factors. The Ministry of Public Health has pushed a goal to help these people not to be a stroke (Ministry of Public Health, 2017). Thus, the people at risk of stroke in Samutsongkram Province need to be analyzed and compared between before and after-stroke leaning.

LITERATURE AND THEORY

According to learning theories, they are conceptual frameworks that describe how students absorb, process, and retain knowledge during learning. Cognitive, emotional, and environmental influences, as well as prior experience, all play a part in how understanding, or a world view, is acquired or changed and knowledge and skills retained (Learning theory (education) – Wikipedia. Retrieved from [https://en.wikipedia.org/wiki/Learning_theory_\(education\)](https://en.wikipedia.org/wiki/Learning_theory_(education))). Educators who advocate constructivism believe that a learner's ability to learn relies largely on what they already know and understand, and the acquisition of knowledge should be an individually tailored process of construction. (Learning theory (education) – Wikipedia. Retrieved from [https://en.wikipedia.org/wiki/Learning_theory_\(education\)](https://en.wikipedia.org/wiki/Learning_theory_(education))). Geographical learning theory focuses on the ways that contexts and environments shape the learning process (Learning theory (education) – Wikipedia. Retrieved from [https://en.wikipedia.org/wiki/Learning_theory_\(education\)](https://en.wikipedia.org/wiki/Learning_theory_(education))). Behaviorists look at learning as an aspect of conditioning and advocate a system of rewards and targets in education (Learning theory (education) – Wikipedia. Retrieved from [https://en.wikipedia.org/wiki/Learning_theory_\(education\)](https://en.wikipedia.org/wiki/Learning_theory_(education))).

RELATED WORKS OR DISCUSSION

A learning process is based on objectively observable changes in behavior. Behavior theorists define learning simply as the acquisition of a new behavior or change in behavior. The theory is that learning begins when a cue or stimulus from the environment is presented and the learner reacts to the stimulus with some type of response. Consequences that reinforce the desired behavior are arranged to follow the desired behavior (e.g. study for a test and get a good grade) (Learning theories Behaviorism, Cognitive and Constructivist. Retrieved from thepeakperformancecenter.com/educational-learning/learning/theories/).

Thus, learning theories are an organized set of principles explaining how individuals acquire, retain, and recall knowledge. By studying and knowing the different learning theories, we can better understand how learning occurs. The principles of the theories can be used as guidelines to help select instructional tools, techniques and strategies that promote learning (Learning theories Behaviorism, Cognitive and Constructivist. Retrieved from thepeakperformancecenter.com/educational-learning/learning/theories/).



METHODOLOGY

The research titled Effects of Learning Stroke of Population Group at Risk in Samut Songkhram Province, Thailand is a mixed method research between a quantitative research and a qualitative research. Sixty persons as a sample used to study were drawn by using a simple random sampling from populations at risk who live in Samut Songkhram Province. The data were gathered between December, 2016 and January, 2017 by using a questionnaire built by the researchers. The statistical techniques used for analyzing were frequency, percentage, mean (\bar{X}) and standard deviation (S.D), and paired t-test.

RESULTS

1. The characteristics of population at risk structure and economy in Samut Songkhram Province

Table 1

The characteristics of population at risk structure and economy (n=60)

Population at risk structure and economy	Number	%
Sex		
Male	28	46.67
Female	32	53.33
Age		
35-49 years	20	33.33
50-64 years	23	38.33
65+ years	17	28.34
Smoke History		
Smoke	2	3.33
Non-smoke	58	96.67
Occupation		
Worker	28	46.67
Private business	18	30.00
Government official/State enterprise	8	13.33
Staff of company	6	10.00
Body Mass Index (BMI)		
<25	22	36.67
≥25	38	63.33
Disease of Population at Risk		
Congenital disease	38	63.33
Non-congenital disease	22	36.67
Marriage Status		
Single	8	13.33
Married	30	50.00
Divorced	22	36.67
Education Level		
Elementary education/vocation	44	73.33
Secondary education	2	3.33
Two-year college	4	6.67
Bachelor's degree	10	16.67
Average Income		
≤ 10,000 baht	15	25.00
10,001-20,000 baht	26	43.33
20,001-30,000 baht	12	20.00
≥30,001 baht	9	15.00



Stroke Learning

Learned	22	36.67
Not learned	38	63.33
Total	60	100

From Table1, it is found that the characteristics of population at risk in Samutsongkram Province were mostly females (68.33%), 50-64 years of age (38.33%), non-smoking persons (91.67%) and workers (41.67%). They had body mass index (BMI) of over 25 (58.33%), the congenital disease of population at risk (63.33%), marriage status (46.67%), elementary education/vocation (73.33%), the average income 10,001-20,000 baht per month (43.33%), and non-learning of stroke (63.33%).

2. Comparing between before and after-stroke learning of population at risk in Samutsongkram Province

Table 2

Understanding of stroke learning of population at risk in Samutsongkram Province (n=60)

Understanding of stroke learning of population at risk	Before learning		After learning	
	persons	%	persons	%
Low level (0-5 scores)	38	63.33	3	5.00
Moderate level (6-10 scores)	20	33.33	7	11.67
High level (11-15 scores)	2	3.34	50	83.33
Total	60	100	60	100

From Table 2, it is found that before learning most population at risk understood about stroke at a low level (63.33%). Only 3.34% of them had the knowledge of stroke at a high level. However, after learning, population at risk understood about stroke at a high level (83.33%). Only 5.00% of them had the knowledge of stroke at a low level.

Table 3

Comparing between before and after-stroke learning of population at risk in Samutsongkram Province (n = 60)

Understanding of stroke learning of population at risk	\bar{X}	S.D.	t	P-value
Before learning	9.57	3.95	11.15	0.00*
After learning	17.80	7.35		

*P<0.05

From Table 3, it is found that before learning population at risk had the lower mean of stroke understanding (\bar{X} = 9.57) than the mean of after-learning (\bar{X} = 17.80). With respect to comparing by using paired t -test, it is found that there is statistically significance difference at α .05 between before and after-stroke learning of population at risk in Samutsongkram Province.

3. Comparing between before and after-stroke-self-care behavior of population at risk in Samutsongkram Province



Table 4

Before and after-stroke-self-care behavior of population at risk in Samutsongkram Province (n=60)

Level of self-care behavior of population at risk	Before-self-care behavior		After-self-care behavior	
	persons	%	persons	%
Very good (4.21-5.00 scores)	0	0	10	16.67
Good (3.41-4.20 scores)	6	10.00	34	56.67
Fair (2.61-3.40 scores)	11	18.33	13	21.66
Poor (1.81-2.60 scores)	24	40.00	3	5.00
Very poor (1.00-1.80 scores)	19	31.67	0	0
Total	60	100	60	100

From Table 4, it is found that before learning about stroke, the population at risk mostly had a poor level and a very poor level of stroke-self-care behavior, respectively (40.00% and 31.67%). After learning, the population at risk mostly had a good level of stroke-self-care behavior (56.67%).

Table 5

Comparing between before and after-stroke-self-care behavior of population at risk in Samutsongkram Province (n=60)

Self-care behavior of population at risk	\bar{X}	S.D.	t	P-value
Before learning	2.40	0.50	-2.833	0.008*
After learning	3.47	1.90		

*P<0.05

From Table 5, it is found that before learning population at risk had the lower mean of s stroke-self-care behavior (\bar{X} = 2.40) than the mean of after-stroke-self-care behavior (\bar{X} = 3.47). With respect to comparing by using paired t -test, it is found that there is statistically significance difference at α .05 between before and after-stroke-self-care behavior of population at risk in Samutsongkram Province.

CONCLUSION AND FUTURE WORK

From the research findings, it is found that before stroke-learning the population at risk mostly understood about stroke at a low level (63.33%). Only 3.34% of them had the knowledge of stroke at a high level. However, after learning, most of them understood about stroke at a high level (83.33%). Only 5.00% had the knowledge of stroke at a low level. Before stroke-learning, population at risk had the lower mean of stroke understanding (\bar{X} = 9.57) than the mean of after learning (\bar{X} = 17.80). With respect to comparing by using paired t-test, it is found that there is statistically significance difference at α .05 between before and after-stroke learning of population at risk in Samutsongkram Province. This may be because the population at risk gained knowledge about stroke that they watched videos not only the causes and symptoms but also methods of protection (Morgan, Laura J., et al., 2002). Moreover, before learning they did not have any information about stroke to learn even though their goal is to have a good health. After learning about the stroke, the population at risk gained a lot of knowledge and understood the method of taking care of their health which is in accordance with Mahimuang’s research finding (2016) and the social cognitive learning theory (Bandura, 1997). This social cognitive learning theory states that people learn from another via observation, imitation, and modeling. The theory has often been called a bridge between behaviorist and cognitive learning theories because it encompasses attention, memory and motivation. The social cognitive learning theory also explains human behavior in terms of continuous reciprocal interaction between cognitive, behavioral, and environmental influences. In addition, the research findings are in accordance with Pattanapokkarattana’s research study (2016). According to his research findings, after-stroke-



training program population at risk had higher mean of gaining knowledge than that of before-having-stroke-training program.

Regarding stroke-self-care behavior, it is found that before learning about stroke the population at risk mostly had a poor level and a very poor level of stroke-self-care behavior, respectively (40.00% and 31.67%). After learning, the population at risk mostly had a good level of stroke-self-care behavior (56.67%). The population at risk had the lower mean of stroke-self-care behavior (\bar{X} =2.40) than that of after-stroke-self-care behavior (\bar{X} = 3.47). For comparing by using paired t-test, it is found that there is statistically significance difference at α .05 between before and after-stroke-self-care behavior of population at risk in Samutsongkram Province. The results indicate that learning is an important factor that changed the population from the risk-behavior to the stroke-self-care one These results are in accordance with Bloom’s taxonomy (1956) which explains that learning focuses on the cognitive domain (knowledge, comprehension, application, analysis, synthesis, and evaluation), effective domain and psychomotor domain. Bloom’s taxonomy has had tremendous influence in assisting teacher of any subjects to design in structure activities that cover the 6 level of the hierarchy. From their research findings, Srikam, W., Kongsin, P., & Oatsawaphonthanaphat, S. (2017) found that early adolescents in Nakornpatom Province, Thailand had eating behavior affecting oral health at the moderate level (\bar{X} = 2.09). The research findings on the title “Effects of Learning Stroke of Population Group at Risk in Samutsongkram Province, Thailand” can help population at risk to understand and aware of stroke-risk factors. Preventing from hypertension, diabetes, cholesterol, heart attack, and fat or metabolic syndrome as the stroke-risk factors will reduce deaths and disability. Furthermore, the research findings will support the policy of the Ministry of Public Health to provide programs of stroke learning for people. For further research study, a spatial framework by larger areas, such as province and geographical region should be used as a study area in order to collect a larger sample size of data of population at risk. The research findings will strongly be supported.

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TCM IN PREVENTIVE TREATMENT OF DISEASES: CONSTRUCTING A NEW MEDICAL MODEL

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ABSTRACT

Abstract— Preventive treatment of diseases is an important part and the core theoretical system of Traditional Chinese Medicine. Its main contents include prevention before diseases, health care, maintenance of vital Qi, prevent before it happen; prevent disease transformation, involving the development of the disease, paying attention to holism and the relationship between vital Qi and pathogenic factors; recovery and sequelae prevention, focusing on physical recovery, to avoid disease recurrence. The idea of preventive treatment of diseases run through the whole process of health, disease and rehabilitation, and should be the core of the national health care thinking.

Keywords— Traditional Chinese Medicine, Preventive Treatment of Diseases, Medical Mode.

INTRODUCTION

“The saints do not treat the disease and disorder; they prevent it from occurring.” TCM in disease prevention began more than two thousand years ago in Huangdi Neijing. Sun Simiao, a famous doctor in the Tang Dynasty, said, “A doctor treats disease; a good doctor prevents disease; a great doctor prevents disease before it happens.” The basic idea is that the wisest doctor will take precautions in time to keep people healthy when they are not ill, so that people maintain a healthy state. The basic connotation is prevention before disease and prevention of disease. Preventive treatment of diseases in TCM has laid the foundation of medical theory and the lofty goal of medicine, advocating cherishing life, preserving health and preventing disease in the future.

The Importance of TCM in Preventive Treatment of Diseases

In the 21st century, with the advancement of medicine and people's demand for health, the trend of medical development is no longer the "infinite pursuit of high technology for the purpose of treating diseases." "Preventing diseases and injuries, maintaining and improving health" has gradually become a major shift in people's understanding of medicine and the pursuit of health. This transformation includes the following changes in thinking. Firstly, modern medical attention to the treatment of diseases is shifting to traditional medicine care about the protection of health. Numerous clinical practices have proven that modern medicine can only solve one-third of effective cases, while more invalid cases return to nature or turn to traditional medicine. Secondly, the objects of medicine are human beings and creatures. There is no doubt that it is a whole, not a segmented organ or cell. Modern medicine focusing on local organs or cells cannot explain and solve the whole operation of human beings and nature and society, and their complex changes in the effects of mutual penetration. Based on the holistic concept, through the simple materialistic view, the correspondence between heaven and man view, the internal and external balance view, the TCM profoundly reveals that the root of disease is the dialectical relationship between the vital Qi and the pathogenic factor, the immunity and repair of the body are the basis of health and treatment, not high-tech instruments, not chemicals, and the idea that Chinese medicine prevent disease is the root of prevention and treatment of diseases.

The Necessity of TCM in Preventive Treatment of Diseases

The problems that modern medicine cannot solve at the world level, such as the development of science and technology, environmental pollution, have caused more and more obvious damage to human health. SARS, AIDS, hypertension, hyperlipidemia, diabetes, cardiovascular and cerebrovascular diseases are not only out of control, but have increased more and more. It has been proved by clinical practice that simple repair medicine is not suitable for future medical development. It is obvious that prevention is more important than treatment and the key is prevention.

At the same time, with the acceleration of the pace of modern society, the number of sub-healthy people has increased, and "sickness in future" has become a universal objective fact. The prevention-based medical concept has been strengthened, laying a good social foundation for the preventive treatment of diseases in TCM. With the change of medical purpose and medical mode, and the higher demands on health put forward by people, the concept and practice of "preventive treatment of diseases" have been raised to an unprecedented height. At the beginning of the 21st century, China has put forward a "forward strategy" from "treating diseases" to "preventing diseases" at the national level. This change of the concept of health maintenance is closely related to the TCM dominant idea of "treating diseases before it occur". At present, the State Administration of Traditional Chinese Medicine (SACM) of China has established the first batch of pilot units of preventive and health care services for "preventive treatment of diseases" throughout the country with a view to build a Chinese medicine preventive health care service system. Each hospital at or above the county level has set up a preventive and health care department, and actively explored effective ways and means of practicing the idea of "preventive treatment of diseases" from the aspects of service content, service model, service platform and operational mechanism. "Preventive treatment of diseases" is the characteristics and advantages of TCM, the core concept of healthy culture of TCM, and the basic principle of the theory of TCM.

The Advantages of TCM in Preventive Treatment of Diseases

3.1. Ensure the health of the nation

Chronic diseases are health killers, and can be effectively prevented through various measures of "preventive treatment of diseases". Cardiovascular and cerebrovascular diseases, malignant tumors, respiratory diseases, and metabolic disorders of over-nutrition have become the biggest killers of human health. There are no specific drugs for such diseases. The book "Guiding Thoughts and Objectives of Modernization of Traditional Chinese Medicine" puts forward "differentiation and protection" to study the formation of health preservation and health care system that effectively improve the quality of life, significantly reducing the incidence of diseases and prolonging life. This is one of the strategic objectives of the development of modern science and technology of TCM in the 21st century. "Preventive treatment of diseases" in TCM is to strengthen the body's constitution as the core of physical exercise and disease prevention, to adapt to natural changes and enhance the body's disease-resistant ability as the basic principle to treat disease before it occurs. It can grasp the life from the change of function and whole system, prevent the disease before it occurs, treat the disease early, prevent the disease from changing and take care of it after it happens. In short, "preventive treatment of diseases" is the highest level of human health care and disease prevention. "Preventive treatment of diseases" can play an important role in improving the health quality of our whole body.

3.2. Reduce medical expenses

Modern medical expenses are rising day by day. How to reduce the investment of the state, society and individuals in medical care? China has adopted a corresponding strategy: gradually shifting the main direction from treating diseases to maintaining and promoting health, the basic policy of health work adheres to "prevention-oriented". The principle of prevention and treatment of TCM has always been permeated with the idea of "preventive treatment of diseases", requiring doctors to be accurate (dialectical), precise (medication accuracy), inexpensive (cheap), convenient (easy to use). Therefore, to carry forward the characteristics and advantages of TCM "preventive

treatment of diseases”, taking countermeasures before people get sick, rather than taking drugs after it, will bring more health benefits to the people and will save more medical expenses. During the “Ninth Five-Year Plan” period in China, the Ministry of Health once conducted a research project to study the benefit ratio of community prevention and prevention investment. The conclusion of the study is that one-yuan prevention can save medical expenses by eight yuan or five cents.

3.3. *Transforming the medical model*

With the change of disease spectrum, the toxic and side effects of chemicals, the increasing number of drug-borne diseases and iatrogenic diseases, as well as the emergence of new epidemic and infectious diseases, have highlighted the advantages of Chinese medicine. The change of medical concept based on prevention lays a good social foundation for the preventive treatment of diseases in TCM. TCM emphasizes the health concept of “people-oriented”, “heaven and man correspond”, “unity of body and spirit” and the leading ideas and health care methods of “preventive treatment of diseases” can better adapt to this change in health needs. The “preventive treatment of diseases” health project will promote the transformation of disease-centered biomedical model into a new medical model with human health as the goal that aims to achieve individualized diagnosis and treatment for human health. Carrying out the work of “preventive treatment of diseases” so that people do not get sick, get sick less or suspend diseases can not only lighten the burden of medical and health care, but also can guide and stimulate demand at the forefront of the development of the times. It can directly or indirectly improve Social productivity forces, promote economic and social development, and contribute to building a harmonious society. Carrying out the work of “preventive treatment of diseases” is an important manifestation of inheriting the academic knowledge of TCM and highlighting the characteristics of TCM. It is also an important way to expand the service field of TCM, and also an important carrier to carry forward and spread the culture of TCM.

Method of TCM in Preventive Treatment of Diseases

4.1. *Prevent diseases before they occur and health preservation*

Health status, sub-health status should actively prevent disease. Huangdi Neijing emphasizes that “there is a vital Qi in the body that pathogenic factor cannot interrupt”, highlighting the role of the vital Qi in preventing disease. Only by strengthening the body can we prevent disease. Only by paying attention to preserve life can we strengthen our body. Adjust the spirit of the will is one of the way to preserve life, and should keep peace and quiet in thoughts, without distracting thoughts. Keep essence and mind inside, avoid excessive emotional changes, open-minded, optimistic and happy, so that you can achieve the purpose of nourishing vital Qi. It contains rich content such as cultivate spirit, physical exercise, reasonable diet, timely health care, scientific medication and so on.

4.1.1. *It is proposed that “the diet is regular, the daily life is normal, and the work is not over load”*

People are required to have a moderate diet and regular life. Although your body still works, do not make it too tired. It also requires abstinence and precision. For example, be opposed to “using alcohol as a water, taking absurd as common, drunk then have sexual activity, to exhaust its essence, to dissipate its vital Qi”.

4.1.2. *“The spirit stays inside; the disease won’t occur” is the way for health preservation*

It regulates the harmony and unity of the human psychological state and the state of social development. It maintains the human body Qi according to the goal of harmony and smoothness, and coordinates with the social development to adapt to social changes without disease.

4.1.3. *Adjust your diet*

Firstly, it should be fixed and quantified regularly so as not to be too hungry or too full. Secondly, it is necessary to avoid intaking unclean or corrupt food, also you should overcome dietary preference and avoid excessive cold and hot.

4.1.4. *Physical exercise*

The ancients mentioned that "The flowing water will not stink, and the often rotating door shaft will not rot." pointed out that timely and appropriate physical exercise improve Qi, blood flow, and visceral regular, so that you can have a healthy and long life. On the basis of long-term practice, many effective methods of physical exercise have been created, such as Wu Qin Xi, Qi Gong, Tai Chi, Ba Duan Jin, Yi Jin Jing and so on.

4.1.5. *"According to heaven and time, unit man with nature"*

The ancients put forward that "Yang is nourished in spring and summer; Yin is nourished in autumn and winter; the human Yin and Yang is nourished by the nature." Sleeping early in spring and summer, sleeping early and rising early as chickens in autumn, sleeping early and waiting for sunlight then rise in winter, and other healthy living habits can adjust the harmony and unity of human body clock and nature, in accordance with the laws of nature, growth, transformation, harvest and storage. Maintaining the body's yang and coordinating the yin yang of the world to adapt to changes in nature without disease.

4.1.6. *Diagnose and treatment differentiation upon different reasons*

Different reasons include people, place and time difference. People are different in age, sex, weight, leanness, as well as in nine different physical constitutions. The land is divided into East, West, South, North, and Middle. There are different seasons throughout the year. According to these different characteristics, they determine the principle of preventive treatment of diseases.

4.2. *Prevent disease transformation*

After getting sick, we should take active measures to prevent disease transformation. Generally speaking, the process of disease transformation is from exterior to interior, from slight to severe, from simple to complex. Therefore, in the process of preventing and treating diseases, it is necessary to master the occurrence, development and transformation of diseases, so as to achieve early diagnosis, effective treatment, treat before the onset of disease increased. Moreover, the emphasis is on targeted prevention.

4.2.1. *Preventive treatment of diseases*

The first chapter of "Golden Chamber Synopsis of Zang-fu-organs and Meridians Disease and Vessel Syndrome" is "See the liver disease, know the liver spread to the spleen, should first strengthen the spleen." According to the physiological and pathological principles of the five Zang-organs (five elements), from the view of holism, they predict the development trend of the original Zang lesions, and take preventive treatment not only against "Zang diseases" to prevent the occurrence of secondary diseases.

4.2.2. *Protect disease-free organs (clinical complications)*

Protecting disease-free organs is to prevent the organs that do not have disease that from getting involved with diseases such as diabetes mellitus, which is characterized by persistent hyperglycemia. Its pathological basis is islet cell dysfunction. If blood glucose is poorly controlled, it will cause heart, brain, kidney, eye and other organs damage and pathological changes. Therefore, in the treatment of diabetes, we attach great importance to reach the standard at early treatment and the repair of islet function, and at the same time, use Chinese medicine to focus on nourishing yin,



promoting blood circulation and dredging collaterals. At present, the detection rate of fatty liver, cholecystitis and cholelithiasis is increasing. Some patients with fatty liver can develop liver fibrosis, even cirrhosis. It can be considered that fatty liver is the early stage of liver fibrosis. If the fatty liver can be treated early and promptly, it can prevent its further development and even reversal. Cholecystitis and cholelithiasis do not only pay attention to diet, but also use some herb from TCM that can reduce damp-heat can improve the bile composition.

4.3. Recovery and sequelae prevention

After getting sick, we should take active measures to prevent disease transformation. Generally speaking, the process of disease transformation is from exterior to interior, from slight to severe, from simple to complex. Therefore, in the process of preventing and treating diseases, it is necessary to master the occurrence, development and transformation of diseases, so as to achieve early diagnosis, effective treatment, treat before the onset of disease increased. Moreover, the emphasis is on targeted prevention.

4.3.1. Prevent sequelae after disease (clinical sequelae)

It is necessary to eliminate the pathogenic factor to secure the recovery and prevent sequelae. The so-called "recovery and sequelae prevention" means to prevent recurrence during recovery or stable condition. Generally, most patients are weak after the initial recovery, which requires that in the rehabilitation of medical treatment, it is necessary to eliminate the pathogenic factor. According to the pathological characteristics of the patients, such as deficiency of Qi and blood, deficiency of body fluid, insufficiency of spleen and kidney, blood stasis and phlegm obstruction, comprehensive measures are taken to promote the recovery of organ function as soon as possible, so as to achieve the goal of recovery with pathogenic factor eliminated and no disease recurrence.

4.3.2. Prevent disease recurrence (clinical episodes or onset disease)

For some recurrent episodes or regular onset of difficult ailments, such as immunity, allergic and endocrine, modern nervous system or some diseases whose etiology is not known in modern medicine, TCM can be used in preventive treatment of diseases by paying attention to reinforcing the body and fixing the root of life during the remission period, combined with emotional adjustment and physical exercise; the curative effect is exact.

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COHERENCE IN LOGIC OF THE FIRST PARAGRAPH IN THE ANALECTS

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ABSTRACT

Abstract— By comparing and analyzing both English versions and Chinese versions of the first paragraph of the Analects, the present study seeks to explore the extent to which the translated versions of the Analects achieve cohesion and coherence in logic with a view to figure out the most logical version of the paragraph. The findings are as follows: (1) Most of the English versions can be diagnosed as being incoherent and illogical or lacking explanatory notes, which consequently fails to provide foreign readers with insightful ideas and enjoyable reading experiences. (2) Many Chinese versions prove coherent in logic but the most authoritative ones separate the whole paragraph into three sentences. (3) The Chinese versions of Nan Huaijin’s (2014) and Liang Wendao’s (2016) can be adopted as the original text for both of them achieve coherence in logic. Although the new interpretation seems to contradict previous ones, a more logical translation is favorable in cultural promotion.

Keywords— the Analects, the first paragraph, cohesion and coherence, logic, explanatory notes.

INTRODUCTION

Amid joys of the Analects circulating to the rest of the world, the translation of the book has regained attention. For a long history of thousands of years, the Analects has exerted great influence on Chinese people and on the insight and interpretation of Chinese people by people abroad. It goes without saying that in the course of Chinese culture going out, Confucius and the Confucian masterpiece Analects would be the pioneer in culture dissemination.

Confucius and its thoughts have also become a gem of the entire world since it was made known abroad. As early as the 17th century witnessed the arrival of the Analects in Europe. From the first Latin version in 1687 in Europe to the present day, the book has developed hundreds of versions which serve as an indicator of the existence of numerous varying understandings on it. However, if more careful deliberation resumes to examine those translated versions, deficiencies will be detected, for instance the neglect of coherence of logic. To probe into defective translations concerning coherence and cohesion in detail, the dissertation will take the translations of the first paragraph of the Analects as a case. The dissertation will serve the purpose to figure out the most effective way to translate the first paragraph of the Analects.

Two factors are at play in choosing the targeted text. It firstly stems from the paramount position which the first paragraph has been widely acknowledged to be in with the second factor lying in its distinguished sentence pattern. Noticeably, the first three sentences have three varied themes, dissimilar to other groups of sentences in the book which either feature one theme or a smooth flow of speech. The likes of ‘The wise won’t get bewildered, the virtuous are not anxiety-ridden, and the courageous are dauntless’ and ‘Learning without thinking leads to puzzlement; thinking without learning is perilous’ are intrinsically far from controversial which are accessible and comprehensive, instead. As for the first paragraph, it is another story. Along with its significant location in the book, the first paragraph boosts the main ideas of Confucius’ and the Analects which have become obscure after being translated, both of which makes the study a necessary and urgent one.

THE IMPORTANCE OF THESIS

The significance of the research would be to dig up the most effective way to translate the foremost sentences in the Analects in a bid to making them acceptable and enjoyable for foreign readers. To the targeted paragraph of the Analects, a new and clear profile will be built up by attempting to create a new angle to appreciate it which is to appreciate it as a whole. In some senses a poor translation will do the cultural dissemination much harm and estrange Confucius and other Chinese works from the rest of the world. To promote and progress Chinese culture, we should not only make foreign readers know it but also attract them to love it and delight in it. But how could readers love it and delight in it without understanding it? Any translated works see to it that the shining thoughts and ideas within the book have been conveyed and effective cultural exchange and communication have been realized. Otherwise efforts on cultural dissemination will buckle under the defects.

RESEARCH METHODOLOGY

As the research aims to analyze the cohesion and coherence in logic of different versions of translation, both comparison and analysis approaches have been adopted to find the best translation strategy. By comparing different versions of translation and different understandings of certain terms by translators, the better version which is more coherent in logic can be found. By analyzing the original text and the translated text, whether cohesion and coherence are achieved or not and how to achieve cohesion and coherence can be figured out. To conclude, the main methods applied in the dissertation are comparison and analysis.

LITERATURE REVIEW

2.1 The Analects

Written during the Warring States period (475–221 BC) and finished in the Han dynasty (206 BC–220 AD), the Analects is a collection of sayings and thoughts attributed to Confucius and his followers, consisting of 12,000 words or 20 chapters, all told. Confucius, one of the greatest thinkers and philosophers in the world history, is the greatest pioneer of civilian education who devoted his life to spreading knowledge. The Analects is the fruit of Confucius' wisdom.

Chapters in the Analects are grouped by different themes while are not arranged in order of stream of ideas. Each saying can be controversially separate from another. For the book has exerted tremendous influence on Chinese people, numerous translators and scholars have made their unremitting efforts on its translation and research.

2.2 Relevant Studies on Cohesion and Coherence

“Cohesion” was first coined by Halliday and Hasan in 1976 who were the founders of systematic functional linguistics. They argued that all passages are endowed with cohesion and connection between different parts of the text. That is to say, if the first paragraph of the Analects is recognized as a passage, it is coherent in nature because “connection” between different parts of a passage plays a decisive role in the clearance and smoothness of a passage (Han and Zhou, 2014). Unfortunately, the argument fail to do right by lexical meaning and logical coherence by focusing on the former.

Whether the organization of passages in the Analects is coherent has long been debated. According to Huang (2002), under the perspective of systematic functional linguistics organization of the Analects is undoubtedly coherent with the reason that no passages exist without being coherent. But the above conclusion drawn can only be limited into the structural level. It has been highly acknowledged that coherence in logic and in meaning is a byproduct of coherence in structure. With such a belief in mind, coherence in logic has been suffered from ignorance by most researchers.

2.3. Relevant Studies on the Logic of the First Paragraph of the Analects

Among all the researches of the Analects, culturally-loaded words and translation on the level of words or sentences have been given priority while analysis of the context and the paragraph as a whole have always been ignored. Taking the English versions of the Analects for example, researchers' eyes have mostly been caught to the correct translation of certain terms and its style or the translation of the culturally-loaded concepts; however, such discussions hardly reach the level as high as exerting influence on culture strategies. What is worse, the ideas and logic behind the literal words have been scarcely explored (Tan, 2009). It has been estimated that there have been 96 master dissertations, 7 doctoral dissertations and around 150 journal articles concerning English versions of the Analects in China until now of which the researches on Legge and Waley account the most. The content of the research mainly focuses on translation theories and linguistics while little concern has been given to figure out whether the translated versions reflect the ideas or spirit of the original text.

DISCUSSION

Given that the intention of the dissertation is to explore the extent to which the translation of the first paragraph of the Analects achieve coherence in logic by comparing different versions of translation, the analysis lists different explanations of the core words of the first paragraph and the first paragraph as a whole given by the translators both at home and abroad. What is also given is the relevant study on the meaning of the first paragraph.

Since the popularity of the Analects, there have been more than 60 English versions, the new ones emerging continuously. But linguists and translators both at home and abroad have had different interpretations on the translation of the first paragraph of the Analects.

3.1. Different Translations of the First Paragraph of the Analects

3.1.1. Different Translations of the Terms

For the first important term '学 xue', most of the translators (Legge, 1861; Waley, 1938; Wang, 1997; Ding, 1999; Wu, 2012) vaguely translated it into 'to learn' or 'what one has learned' except that Xu Yuanchong (Wu, 2011) and Gu Hongming (1898) translated it into 'acquire knowledge'. '时 shi' as another important term means 'at due time' (Lai and Xia, 1994; Li, 1991) or "constantly" (Ledge, 1861; Wang, 1997; Pan and Wen, 1993; Wu, 2012). '习 xi' has been interpreted into 'to repeat' (Waley, 1938; Li, 1991) or 'review and practise' (Lai and Xia, 1994; Wang, 2001; Ding, 1999; Wu, 2012) or 'application' (Legge, 1861). Most of the translators believe that '朋 peng' means 'friends' while Wang (2001) and Liu (1979) regarded it as 'like-minded people'. '远方 yuanfang' has been translated into 'afar' or 'faraway places'. Waley (1938), Lai and Xia (1994), Ding (1999), Li (1991) and Wu (2012) translated '君子 junzi' into 'gentleman' while Wang (2001) and Pan and Wen (1993) considered it as 'superior man'.

3.1.2. Different Translations on the whole paragraph

There have been two main different understandings of the first sentence which are respectively 'It is a pleasure to learn and practise what one has learned at due time' (Lai and Xia, 1994; Ding, 1999; Wu, 2012) and 'It is delightful to learn knowledge and review or repeat it constantly' (Waley, 1938; Pan and Wen, 1993). However, Pound (1969) translated it into 'He said study with the reasoning swinging past is not this pleasant?' and Xu Yuanchong (Wu, 2011) argued that based on the "Theory of Practice" the first sentence is talking about the attitude of doing researches, which should be translated into 'Is it not a delight, said the Master, to acquire knowledge and put it into practice?'. The other two sentences are of no big difference. The second and the third sentences have mostly been translated into 'Is it not a delight after all to have friends come from afar? Is it not a gentleman or a superior man after all who will not take offence when others fail to appreciate him?'



3.2. Relevant study on the meaning of the first paragraph

3.2.1. Chinese Translation of the Analects

According to Huang Guowen, the translation of Chinese classics contain both the intralingual translation and the interlingual translation (Wu, 2011). All English versions of the Analects begin with the interpretation of the original text. There are three main modern Chinese translations of the Analects which are written by Cai Xiqin, Nan Huaijin, as well as Yang Bojun, Wu Shuping and Yang Shuda separately. Cai (2003) regarded ‘学而时习 xue’ershixi’ as ‘to learn and practice’, interpreting the whole paragraph into ‘Is it delightful to learn knowledge and practice it constantly? Is it not a delight after all to have friends come from afar? Is it not a gentleman or a superior man after all who will not take offence when others fail to appreciate him?’ Yang and Wu (1993) defined it as ‘to learn and review’ whose interpretation is almost same to Cai’s (2003) with only the first sentence different which is ‘Is it delightful to learn knowledge and review it constantly?’ Nan (2014) and Liang (2016), however, concluded that to learn and to reflect or practise it are the key to have great attainments. ‘学 xue’ is not about commanding some specific knowledge but having the great virtue and being cultured. ‘朋 peng’ has been mostly translated into ‘friends coming from afar’ while Nan (2014) and Liang (2016) translated it into ‘those who share same belief and knowledge with you’ for they both have been convinced that friends can be good or bad and a bad friend coming from afar would not be a pleasant experience. One thing should be mentioned is that the discrepancies between Chinese versions in ‘君子 junzi’ is not noticeable.

All in all, ‘Isn’t it a pleasure to learn and constantly practice or review what is learnt? Isn’t it delightful to have friends coming from afar? Isn’t he a gentleman who is not annoyed for not being understood?’ is the most popular Chinese version while some other versions which are more coherent and logical enjoy their distinctiveness represented by those of Liang Wendao’s (2016) and Nan Huaijin’s (2014).

3.2.2. Different understandings of the coherence of the first paragraph

The Analects as a record on the discourses between Confucius and his disciples compiled by Confucius’ disciples has been mostly considered as independent and irrelevant from chapter to chapter, from sentence to sentence. The first paragraph of the Analects has been viewed by most of the Chinese scholars such as Zhu Xi, Qian Mu and Yang Bojun as three separate sentences which should be interpreted literally into ‘It is delightful to study followed by reviewing and practicing what one has learned. It is delightful to have friends come from afar. One can be a gentleman if he/she would not be angry on someone else’s misunderstanding.’ This kind of interpretation has found an echo in most of the English versions and Chinese versions. However, many scholars have stood out to challenge the conventional profile, claiming the first paragraph a coherent one.

Nan (2016) argued in his book regarding the Analects that the first paragraph as a whole shows us the right attitude and spirit to gain knowledge and achieve self-improvement, from studying and attracting those who share the same belief with you to being calm and gentle. Moreover, with the perspective of the systematic functional linguistics, the paragraph should be put into a teaching circumstance where a teacher is enlightening his students to think about ‘learning’ and to accumulate experience (Wei and Zhang, 2006). Li (2004) wrote in his book *Reading The Analects Today* that the first three sentences reveal that ‘to be happy for study for human beings’ ‘to be happy for being a group’ ‘to have dignity and individual personality even if being in a group’ separately with its meanings getting deeper sentence by sentence. Fu (2007) interpreted it into “firstly studying hard on one’s own and then interacting with one’s bosom friends and finally being able to free from distractions from outside. In his book *Interpretation on the Analects*, Wu (2016) pointed out that the first paragraph of the Analects asks three famous questions which are respectively about time (studying and then practicing), space (having friends from afar) and relationship (how one react to others’ comments). In this case, the three sentences have been considered as a whole.



Liang (2016) makes the three sentences even closer and more connected by interpreting the first paragraph into “If you study hard to attain self-improvement and have opportunity to make use of your ability to make contributions to the world, it is delightful. But if you would not have that kind of opportunity and you fail, you are not alone because there are so many fellows who can give you company. Provided that you do not have a friend at all to share your woe with and you do not feel discouraged and angry, you can be called a gentleman”. The new kind of interpretation has come from his doubt to the previous versions which regard “study hard and constantly practice what is learnt” as a delightful experience and “have friends coming” a thing worth being happy for. He claimed that there must be undiscovered ideas behind the first and the most important paragraph which is not likely to be three separate sentences that teach readers three different lessons.

It can be concluded in the chart that: (1) Positive opinion holders are in a large number; (2) Positive opinions are slightly different from each other; (3) All viewpoints prove themselves reasonable ones. (4) There will be a long way to go to translate them into English

3.3. Studies on the Explanatory Notes or Illustrative Comments

Conclusions can be drawn in wake of a total of 8 translated versions being analyzed that most of the English versions of the Analects provide explanatory notes only for some words and some version do not give any explanatory notes at all such as that of Pan Fu'en's and Wen Shaoxia's (2009). Moreover, most Chinese versions have explanatory notes but do no good to foreign readers.

The only English version with exhaustive explanations is A New Annotated English Version of the Analects of Confucius by Wu Guozhen which was published in 2016. In his book, Wu (2016) gave his translation followed by notes of specific terms as well as historical facts and comments of the three sentences. In so doing, although his translation of the text alone does not achieve coherence in logic as most of the English versions do, his readers can get the whole picture with much more details of the ideas of Confucius' and the book. His translation and explanatory notes as a whole can be considered as a coherent version, intelligible and understandable.

CONCLUSION

The first paragraph of Chapter I which is believed to be the topic sentences of the whole book should have been put in a paramount position. However, it turns out to be obscure, lacking coherence in logic in most of the translated versions. Deficiencies in the translations of the first paragraph can be considered as the most severe of its kind through the book. It stems in part that no other sentence in the book resemble the first three which involves three different themes respectively. And most of the English versions fail to achieve coherence in logic with the main culprit tracing back to the ignorance of the connection of logic between the three sentences. What makes it worse is that, almost all translated versions are devoid of explanatory notes or illustrative comments if those in Chinese are phased out. In the meanwhile, the most authoritative Chinese versions separate the whole paragraph into three sentences which have been adopted by the majority of the English versions. The only exception has been represented by the English version of Wu Guozhen's (2012) in his new book A New Annotated English Version of the Analects of Confucius which can be said to have set a good model for translators by providing detailed notes and additional messages to help readers grasp Confucius' thoughts and delight in reading it.

Given that some Chinese versions such as that of Liang Wendao's (2016) have achieved coherence in logic, English versions can be translated from these versions or to provide readers with more comments or introductions of the translated text. Moreover, to help foreign readers know Chinese classics, love Chinese classics and delight in Chinese classics, historical facts or explanatory notes or comments should be given following the translated text. At the top of all, logical and coherent translations are the fundamental and the most effective media in cultural exchange, ensuring that the efforts made can come to fruition.



As stated before, to put theories into actions, or rather, to translate logical and coherent Chinese versions into English without loss of structure is not an easy feat. However, to promote Chinese culture, sweat shall be offered.

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WOMEN’S PREFERENCES AND FACTORS INFLUENCES CHOICES OF THE OBSTETRIC SERVICES AMONG RURAL POPULATION OF SINDH, PAKISTAN

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ABSTRACT

Abstract—The objective of this study was to explore women’s preferences and factors influencing the obstetric services in a rural setting of Sindh Province. This cross sectional study was conducted on 100 women who were interviewed by using a validated questionnaire. The women who had given birth during the year preceding the study were eligible for inclusion in the study. The mean age of the participants was 27.5 ± 2.0 and majority 86 (86%) of them were housewives. About 87 (87%) participants had an opinion that their obstetrical health decisions were always taken by their household members and families. 65 (65.7%) women reported that they consulted public hospitals for their antenatal care visits and 69 (69.6%) women preferred private health facilities for antenatal visits. More than half (62.2%) of the participants had delivered their last child in a public health facility, however, 39 (39.2%) women still preferred to deliver at home. Factors such as availability and affordability for health services were significant among pregnant women, those with income more than twenty thousand rupees per month, those with formal education as they were getting better obstetric care compared to those who had less income (<0.05) and those with no formal education. Study concluded that affordability and availability of services around pregnancy and birth were major factors responsible for preference for maternal care and could be linked with poor obstetrical care among rural women of Sindh. However, it is imperative to provide the obstetric care which is accessible without inconvenience.

Keywords—Maternal care, Obstetric care, Antenatal care visit and affordability, availability

INTRODUCTION

Although maternal survival continues to improve globally, yet many countries still struggle to contain the burden of maternal mortality [1]. Annually about 358,000 maternal deaths are reported globally, despite of significant improvement in health care services. Huge inequalities across the countries underline the maternal mortality problem, for instance, 87% of maternal mortality burden is shared by South Asia and Sub Saharan African regions only [2]. Factors surrounding at the time of birth are the main reasons for high burden of maternal deaths. Therefore, pregnant women are exposed to unidentified risks at the time of antenatal care visits so the skilled birth attendant is an excellent approach to ensure a successful delivery [3]. Labour and childbirth are important events of a woman’s life during which she requires special care by her family and health care provider. Because the women and their babies are most vulnerable during the period surrounding the birth decisions about appropriate place of delivery can guarantee positive health outcomes for both mother and her child [4]. Latest reforms of the National Institute for Health and Care Excellence guidelines for Intra-partum care approves that women with healthy pregnancies must be provided with a choice of desired birth mode, place of birth and any desired setting which must be accessible to all pregnant women [5]. Giving birth is generally considered as a stressful event in the life of woman [6]. Mother’s safety during birth must be an essential priority but it is often undermined [7]. Various factors can affect women and



her newborn their timely management can bring positive outcomes [8]. Cheaper quality of drugs is another common problem while managing the health of mother and child in developing countries like Pakistan [9].

Women’s survival during birth is determined by management during labour, interest and care given by birth attendants, and attention given by their immediate family members [10]. The pregnant woman and her relatives usually prefer that the place of delivery is located near their home [11]. Facility based deliveries in rural areas need to increase so that these women deliver within a safe environment and with skilled providers [12]. World Health Organization recommends that for improvement of maternity services such as better quality of care, along with facility based births can significantly dent the burden of maternal mortality in countries struggling with maternal survival [13].

Better access to healthcare positively improves maternal and neonatal health resulting in better health outcome [14]. High burden of maternal mortality and morbidity in developing countries can be reduced by ensuring antenatal care visits and births with skilled and experienced care providers during labour [15] [16] [17]. Although previous research has sought to identify risk factors of poor obstetrical care, the factors women’s choice and preference for the birth attendants need further exploration in our local context. Therefore the present study aimed to investigate women’s preferences and factors influencing the obstetric services in a rural setting in the province of Sindh.

METHODS AND RESULTS

A cross sectional study was conducted from January to March 2017 in a rural area of Hyderabad district. A sample size of 100 women was calculated with 10% margin of error, alpha 5% and 50% estimated prevalence. Simple Random sampling methods was adopted for the selection of participants from the list of clients registered with lady health workers in Hyderabad. The women were interviewed through a validated and pretested questionnaire [18]. Women who had delivered a child during the year preceding the study with an age range of 20 to 35 years were included in the study. However, women who experienced a stillbirth were excluded from the study. Dependent variables were preference for the health care providers for the maternal care services during pregnancy and childbirth and obstetrics factors, and independent included socio-demographic characteristics, marital status, education level and financial status of the participants. Proportions, mean (SD), median and mode were calculated by using descriptive analysis. The ethical approval was obtained from the institutional review board of Health Services Academy, Islamabad. A written informed consent was also obtained from the participants before the interviews. Strict anonymity and confidentiality was maintained for participants during this study. The average age of respondent was 27.5 ±2 years. The detailed socio-demographic characteristics are given in (Table 1).

Table 1: Socio Demographic characteristic of maternal women N=100

Socio-demographic Variables		Frequencies (n %)
Age	20-27	32(32%)
	28-35	68(68%)
Marital status	Married	98(98%)
	Widow	2(2%)
Monthly Income	<20000	73(73%)
	>20000	27(27%)
Education Level	No Formal education	48(48%)
	At least primary education	52(52%)

For the preference of women for seeking obstetrics care, 67 (66.8%) women had their antenatal care visit done in a public sector health facility and 71 (70.6%) women preferred private facilities for such care. Similarly, 62 (62.2%) women had their last birth in a health facility and 40 (39.5%) women delivered at their homes. Around 90 (90.1%) women could not afford a private sector facility but were willing to go there because they believed that the health care services in public sector health facilities were of poor quality (Table 2).



Table 2: Women’s preference for antenatal care visit and place of delivery N=100

Preferences of the women		
Nature of visit	Frequency (%)	Percentage
Last Antenatal Care Visit		
Clinic Setting	14	13.7%
Public health facility	67	66.8%
Private health facility	19	19.5%
Preference for Antenatal Care Visit		
Clinical Setting	10	9.8%
Public health facility	19	19.6%
Private health facility	71	70.6%
Place for last delivery		
Home Based	10	10%
Public health facility	62	62.0%
Private health facility	28	28%
Preferred Place for delivery		
Home	40	39.5%
Public health facility	34	34.1%
Private health facility	26	26.4%
Factors that influence preferences for obstetric services		
	Availability	
Availability of Medical-Staff	40	40.2 %
Decision Making	10	10.4 %
Family support	50	49.4 %
	Affordability	
Affordability (able to pay for services)	90	90.1%

Availability of services in a health facility was considered an important factor. The preference of health facility for maternal service utilization including antenatal care was preferred by women whose income was twenty thousand rupees or more per month and those with some formal education. The preference of obstetrics services was statistically significant (<0.05) with their husband’s income.

Likewise, the affordability as a factor for the preference of health services use during pregnancy and birth was significantly related for the monthly income of rupees, 20 thousand per month of the husband(p<0.05) and some formal education.

Furthermore, for families whose income was more than twenty thousand rupees per month could afford regular antenatal care compared to those who had income less than twenty thousand rupees per month. Likewise, the educated families were aware of the importance and wanted to visit doctors regularly compared to those with no formal education (Table 3).

Table 3: Factors (availability and affordability) influencing choice of obstetric service utilisation (N=100)

Variables	Availability n (%)	P value
Marital Status		
Married	74(74.4%)	0.001
Widow	19(19.8%)	
Monthly Income		
<20,000	21(20.8%)	0.001
>20,000	66(66.9%)	



Education Level		
No Formal Education	29(29.2%)	0.001
Formal Education	85(85.7%)	
Preferred antenatal Care	71(71.3 %)	0.001
Preferred delivery Place	65(65.6 %)	0.001
Affordability		
Marital Status		
Married	35(35.2 %)	0.001
Widow	83(83.3 %)	
Monthly Income		
< 20,000	79(79.2%)	0.001
> 20,000	33(33.1%)	
Education Level		
No formal education	69(69.5 %)	0.001
At least primary education	35(35.3 %)	
Preferred antenatal Care	77(77.3%)	0.001
Preferred place of delivery	72(72.3 %)	0.001

DISCUSSION

The choice her the place of delivery for pregnant women were very limited in public sector hospitals and these findings are consistent with other studies [19] [20]. Women also lacked the quality care and positive behavior from the staff in health facilities. Hence, most of the women preferred to deliver at home rather than going to public health facilities. This is the reason that women were hesitating to attend all antenatal care sessions [21]. A recent study showed that due to high cost for obstetrics care services, most women were unable to these services resulting in a high maternal mortality rate. This high cost associated with obstetric care services included costs incurred during antenatal care sessions and buying medicines during pregnancy. This made them prefer home deliveries rather than births in private or public hospitals [19]. Another research carried out to measure the level of quality of health services and barriers to the utilization of obstetric services by communities, found that unavailability of health services and non-functional status of health facilities were the major obstacles [22]. Our results showed that lack of availability of services, poor supplies and equipment to enable institutional deliveries in the public hospitals were major factors for the selection of facilities for services around pregnancy and birth. These results are consistent with the study on women’s perception about quality of maternal care services in Nepal [23]. In another study conducted in Cambodia the utilization of obstetric services was greatly influenced by two main determinants. First, the behavior of the care providers during institutional deliveries and secondly the cost associated with the service utilization. High cost of services, therefore, has been considered one of the major barriers in utilization of services. Our results are consistent with similar results from other regional countries. Cost of care during pregnancy and birth and unfriendly attitude of birth attendants as well as antenatal care providers in the health facilities are two major obstacles to the use of maternal care in many rural communities [24]. High prices has led to discourage women from seeking consultations for antenatal care, which is again consistent with the findings from the present study [25]. Another study from Pakistan explored the reasons for the low rates of utilization of obstetric services in Pakistan. The survey focused mainly on services like antenatal care, labour, and post-natal care. This study also showed that staff behavior and care providers’ attitude were negatively impacting the use of these services [26].

In conclusion, they found that the factors like affordability and availability of care services during pregnancy and birth were significantly influencing the preference for obstetrical care utilization among rural women of Sindh. Income and education were the main factors responsible for selecting the services. Pregnant women were found to be interested in visiting private health facilities because of availability of proper treatment and positive staff attitude. Therefore it is necessary to provide similar care at public health facilities to ensure that women are



encouraged to avail them at a reasonable and affordable price. The study also showed that women with empowerment for decision making and formal education were aware of the consequences of negligence of antenatal care.

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CADMIUM AND LEAD CONTAMINATED IN FISH COLLECTED FROM MARKETS IN THAILAND AND HEALTH RISK ASSESSMENT

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ABSTRACT

Abstract—The purposes of this study were to investigate the cadmium and lead concentrations in edible portions of river fish that collected during wet season and dry season from market at 4 provinces near Chao Phraya river of Thailand including, Nakhon Sawan (NK), Chainat (CN), Singhaburi (SB) and Angthong (AT) and determine the potential health risk of the observed concentrations of both metals to human health. The maximum concentration of cadmium was found in *C. striata* from AT province during the wet season at 1.357 mg/kg dry weight. The maximum concentration of lead was found in *K. bleekeri* from AT province during dry season at 0.658 mg/kg dry weight. The cadmium concentrations in *C. striata*, *P. hypophthalmus*, and *K. bleekeri* as wet weight basis exceeded the permissible limit level in fish that have been proposed by EU (0.05 mg/kg wet weight) whereas the concentrations of lead did not exceed the permissible limit level of the EU (0.3 mg/kg wet weight). The obtained daily intake of cadmium from selected fish species varied between of 0.011 – 0.573 µg/day which did not exceed the maximum allowable guideline level established by the WHO (1 µg /kg B.W/day). Similarly, the obtained daily intake values of lead from selected fish species in each sampling site varied between of 0.115 – 0.340 µg/ kg B.W/day which did not exceed the maximum allowable guideline level established by the WHO (3.5 µg/kg B.W/day). The calculated target hazard quotient values in this study were not greater than 1, suggesting the safe level through consumption of these fish.

Key words— cadmium, lead, fish health risk, Thailand



INTRODUCTION

Cadmium and lead are heavy metals that potentially cause adverse effect to human health [1] [2]. They are ubiquitous in environment and accumulated in all part of environment including atmosphere, soil and aquatic ecosystems. Cadmium and lead are toxic metals that were classified as carcinogens. They can cause several adverse effects to human health by disruption of several biochemical processes and can induce renal, prostate and ovarian cancers [1] [2]. Due to its properties, cadmium and lead are readily to dissolve in water and have high potential to contaminate in all part of aquatic ecosystems and subsequently to accumulate in food chain [3]. The heavy metal aquatic contamination is a threat to humans who consume contaminated water and aquatic organisms. Fish are the important fishery component of aquatic ecosystem which occupy a high trophic level and have been reported to be the important sources of human protein. The contamination of heavy metals in fish can reflect the water quality and the bio-accumulation of heavy metal in food web [4]. Currently, contamination of heavy metals in river has become a matter of great concern due to the fact that heavy metals contaminated water and fish are one of the routes for non-occupational exposure for human [5]. Due to fish’s high nutritional content, fish have been recommended for consumption among people in several regions. Thus, fish consumption has increased in several regions in the world and the quality of fish and their products are of interest. Prolonged consumption of river fish that contaminated heavy metal may increase the risk to have adverse effect on human health. Therefore, contamination of heavy metals in fish is increasing global attention [4]. To prevent the health problems to humans and to maintain clean aquatic ecosystems, the contamination of heavy metals in fish should be monitored regularly [6].

In Thailand, inland capture fisheries from river and lake are an important source of animal protein for the rural people [7]. The captured fish from river mostly come from the fishermen who live near the river side. In the central part of Thailand, the major river fish are mostly from Chao Phraya River. This river is 320 meter long which begins from the confluence of Ping and Nan River at Nakhon Sawan city. The river flows from the north to south and flows to the gulf of Thailand at Samutprakarn province. The area of the Chao Phraya River basin is approximately 160,000 km², which is 30% of the total area of Thailand [8]. The Chao Phraya River supplies water and several aquatic organisms particularly the river fish for people. There are approximately 300 species of fish in the Chao Phraya River; the dominant species in this river are cyprinids and various catfish taxa [9]. Nowadays, the Chao Phraya River has been reported to suffer from pollutions which come from industrial sources, leachate from agricultural activities and untreated urban discharges. Witjaya [10] stated that high level of cadmium, copper, chromium, lead and zinc concentrations were found to accumulate in Chao Phraya river sediment at the sampling site that mainly located within Bangkok area which near the river mouth. The major source of heavy metal accumulation in Chao Phraya river sediment was from anthropogenic activities [10]. However, the data about contamination of heavy metal in river fish in Thailand are still scarce. Reports about heavy metal in river organisms mostly found from a study that collecting organisms from the Chao Phraya River’s mouth of Cheevaporn and Menasveta [11] found that several heavy metal including lead cadmium and mercury were observed at high concentrations in mussels and clams from river mouth of Chao Phraya River that located at the inner gulf of Thailand. Cheevaporn and Menasveta [11] suggested that organisms in the river mouth of Thailand particularly the important sea food such as clam and mussel accumulated the high concentration of heavy metal which may pose a threat to human health. They also suggested regularly monitoring the contamination of heavy metal in aquatic organisms. Dumme et al [3] determined several heavy metals in water, sediment and snail in Beung Boraphet which is the largest lake of Thailand that located in Nakhon Sawan province. This lake connects to Nan River by over spills of the river during rainy seasons. The contents of several heavy metals including copper, manganese, ferrous, zinc, lead and cadmium were determined during wet and dry seasons. Dumme et al [3] found that water



quality of Beung Boraphet was medium level of cleanliness. The sediment of the lake contained high concentrations of ferrous and copper and the high bio-accumulated of manganese was found in snails and aquatic plants. They also suggested using snails and aquatic plants as the bio-monitors of sedimentary metal of the lake.

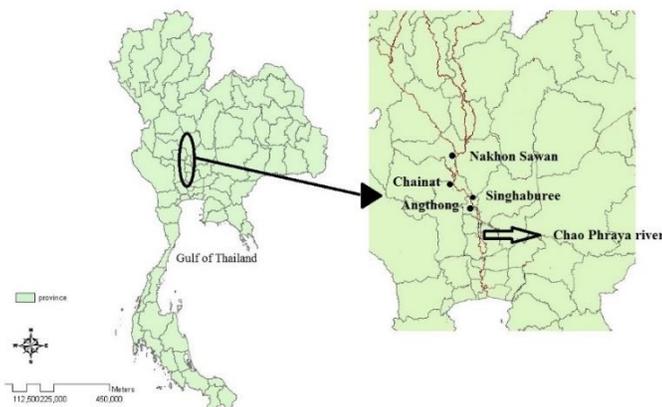
However, the concentrations of cadmium and lead in fish from Chao Phraya River or from the market proximal to the Chao Phraya River need to be studied due to the scarcity of the data. In addition, the area of Chao Phraya River is the largest area for the irrigation rice cultivation in Thailand (55 % of irrigation area in Thailand) [12]. The Chao Phraya dam was constructed at Chainat province to elevate the river level for contribution of irrigation areas. Therefore, the areas surrounded the Chao Phraya river including, Nakhon Sawan province, Chainat province, Singhaburee province, Angthong province are the major provinces that cultivated rice under irrigation system [13]. Therefore, the leachate contaminated heavy metals from paddy fields may be carried to Chao Phraya River which may cause accumulation of heavy metals in river ecosystems. In addition, studies of concentrations of cadmium and lead in marketed fish captured from the 4 provinces and the health risk assessment are still scarce. Therefore, the purpose of this study was to investigate the concentrations of cadmium and lead in river fish that collected from markets near Chao Phraya River. The collected species of fish in this study were mostly captured from the river. The risk assessment was conducted to assess the potential health risk in term of dietary intake and target hazard quotient for people who live in the vicinity area of Chao Phraya River.

MATERIALS AND METHODS

1.1 Sampling site

The sampling site in this study were markets located in the city near Chao Phraya River; the site, from upstream to downstream, included Nakhon Sawan (NK) ,Chainat (CN) ,Singhaburi (SB) and Angthong (AT) (figure 1). Fresh fish were collected during wet season (August) and after wet season (November) in Thailand in 2015.

Figure 1
Sampling sites for collecting of fish sample at cities near Chao Phraya River in Thailand



1.2 Sample collection and preservation

Almost of the selected species of fish were restricted to Chao Phraya River. These fish were to be consumed by the people in the vicinity of Chao Phraya River and were probably caught by the local fishermen. The species of river fish were available at the open market in the morning. Different fish species were collected from the



same period. However, if there were the same species of fish was sold by different fishermen, at least 3 samples from 3 different fishermen were obtained. After collection fish samples, the fish were washed by clean water to remove some fouling and then the samples were weighted and preserved in the ice containers. Some of the preserved fish were brought to identify species and the rest were brought to the next process.

The preserved fish samples were transported to the laboratory and then they were subjected to another wash with clean water. The pre-treatment processes of the edible portions of the sample were conducted in a manner to imitate processing of regional people prior to consumption. Almost all of the fish samples were processed by removing the scales, head, fin, tale and bones followed by cutting the edible portions (muscle tissues) into small pieces and washing thoroughly with distilled water; the edible portions were weighted before drying with the hot air oven. However, some of species of the fish samples were to be consumed without remove scales bones and heads due to the fact that they were small fish. Therefore, these small fish samples were cut into small pieces without remove scales, heads and bones.

The fish samples were dried in the hot air oven at 80 °C (Contherm Rmotec 2000) overnight until the constant dry weight was reached. The dried samples were pulverized by wood mortar and then stored in polythene zip-bags and keep in desiccators.

1.3 Digestion and heavy metal analyze

The digestion method in this study was conducted based on the method described in Hseu [14]. Briefly, 1 g. of pulverized fish was weighted and placed in glass beaker with 5 ml of concentrated HNO₃ followed by 10 ml of concentrated H₂SO₄. After mixing the pulverized fish samples and the acids the mixture would liquefy; when the reaction was complete the samples were heated using a hotplate. The samples were heated on medium heat until the mixture decrease in volume and a clear solution. Then the solutions were left to cool at room temperature and then filtered using filter paper (Whatman No.5 diameter 110 mm). The filtered solutions were then added into 50 ml volumetric flask: deionized water was added to reach final volume of 50 ml. Prior to use, every glassware was washed with deionized water and rinsed with 10% of HNO₃. All rinsed glassware was left to dry at room temperature before using.

The samples were analyzed by using graphite furnace atomic absorption spectrophotometer Shimadzu (Model AA-7000 Corporation, Japan). The lower limit of detection of cadmium is 0.02 µg/kg and lead is 0.02 µg/kg

1.4 Accuracy check

To validate the analytical procedure, the Thailand reference material (TRM) - trace and essential elements in prawn (TRM-F- 4002) was obtained from National Institute of Metrology Thailand (NIMT) for validation of analytical procedure. The results of cadmium and lead content in TRM are shown in table1. The percentage recovery of known elements was 95-99% and the result of the observed values of Cd and Pb in TRM were acceptable in reference to the certified values.



1.5 Estimated daily intake

The estimated daily intake (EDI) in this study was determined by the following equation:

$$EDI = \frac{C_{metal} \times W_{food}}{BW} \quad (1)$$

Where C metal is the concentration of heavy metal in fish ($\mu\text{g}/\text{kg}$ fresh weight) which use the convert factor of dry weight to wet weight based on Yang and Miyazaki [15]; W food is the average consumption rate of fish in Thailand and Bw is the average body weight of people in Thailand. In this study, the rate of fish’s consumption is 85 g/person/day (based on fresh weight) and body weight is 50 kg which based on Agusa et al [16].

1.6 Target hazard quotient

In this study, target hazard quotient (THQ) was used to determine the health risks from consumption of fish. The THQ was calculated following the USEPA [28] and Javed and Usmani [17] which was as follow:

$$THQ = \frac{EFr \times ED \times FI \times MC}{RfD \times BW \times AT} \times 0.001 \quad (2)$$

Where EFr is exposure frequency (365 days/year). ED is the exposure duration (70 years). FI is food ingestion rate which was 85 g/day/person [16]. MC is the concentrations of metal in fish ($\mu\text{g}/\text{g}$ of fresh weight). RfD are the reference doses of cadmium (0.001 $\mu\text{g}/\text{g}/\text{day}$) [1] and lead (0.004 $\mu\text{g}/\text{g}/\text{day}$) [2]. BW was average body weight of Thai people which was 50 kg [16]. AT is the average time for expose to non-carcinogen substance (365 days/year \times number of exposure year which was 70 years). THQ values less than 1 indicates adverse effect are unlikely for people exposed to these toxic substances. If the THQ values are close to 1 or higher than 1, there is risk that exposure may produce some adverse effects.

1.7 Statistical analysis

Kruskal – Wallis test was used to test the differences between the concentrations of heavy metal in each sampling sites because the data in this study showed the non-parametric characteristics. The test also was applied to test whether the concentrations of cadmium and lead differed among sampling site in each period. Kruskal – Wallis test was performed by using R- program [18] and the test results were considered to be statistically significant at $p < 0.05$.

RESULT

1.8 The species of fish collected from markets

The 12 families, 17 genus and 20 species of fish were collected from the open markets in 4 provinces of Thailand during wet and dry seasons. The species of fish in family cyprinidae (carp) was mostly found from all sample sites; other common fish included pangasiidae (shark catfish), bagridae (catfish), siluridae (sheatfish), notopteridae (featherback), cobitidae (loaches), metacembelidae (spiny eel), soleidae (soles), synbranchidae (swamp eel), channidae (snakehead), anabantidae (climbing gouramies), sisoridae (sisorid catfish) and dasyatidae (fresh water stingray) as shown in table 2 and 3. These fish can be classified in to 3 groups based on behaviors including, pelagic, benthopelagic and demersal [19] [20].



Table 1

Cadmium and lead content in Thailand reference material (TRM) (mg/kg, average ± SD)

Element	Certified value	Average value	Recovery (%)
Cd	2.05 ± 0.2	2.03 ± 0.003	99.02
Pb	1.80 ± 0.1	1.72 ± 0.02	95.31

Table 2

The concentration of cadmium and lead (geometric mean n>1 and individual value n = 1) in edible portion of river fish during wet period

Sample site	Fish samples		Number of sample	Cadmium	Lead	
	Common name	Scientific name		mg/kg dry weight	mg/kg dry weight	
NK	Common silver barb	<i>B. gonionotus</i>	n = 1	nd	0.226	
	Soldier river barb	<i>C. enoplos</i>	n = 3	0.03 (nd-0.03)	0.248 (0.223 – 0.290)	
	Apollo shark	<i>L. bleeker</i>	n = 1	0.205	0.234	
	Snail-eating catfish	<i>P. conchophilus</i>	n = 1	0.027	0.464	
	Iridescent mystus	<i>M. vittatus</i>	n = 1	nd	0.239	
	Long-nose loach	<i>A.-choirorhynchos</i>	n = 1	0.252	0.221	
	Peacock eel	<i>M. siamensis</i>	n = 2	0.167 (nd – 0.167)	0.299 (0.249 – 0.299)	
	Armed spiny eel	<i>M. armatus</i>	n = 1	0.128	0.288	
	Smallscale tongue sole	<i>C. microlepis</i>	n = 1	0.069	0.373	
	Swamp eel	<i>M. albus</i>	n = 3	0.026 (0.023-0.034)	0.240 (0.237- 0.246)	
	Freshwater stingray	<i>D. bleekeri</i>	n = 1	0.035	0.237	
	Giant Bagarius	<i>B. yarrell</i>	n = 1	nd	0.277	
	CN	Yellow catfish	<i>M. nemurus</i>	n = 1	0.103	1.134
		Whisker Sheatfish	<i>K. bleekeri</i>	n = 1	0.612	0.304
Great white sheatfish		<i>W. attu</i>	n = 1	0.107	0.379	
Giant Bagarius		<i>B. yarrelli</i>	n = 1	0.100	0.318	
SB	Striped catfish	<i>P. hypophthalmus</i>	n = 1	0.748	0.298	
	Swamp eel	<i>M. albus</i>	n = 3	0.152 (0.144-0.161)	0.410 (0.360 – 0.452)	
	Whisker Sheatfish	<i>K. bleekeri</i>	n=1	0.036	0.221	
	Shark catfish	<i>P. macronema</i>	n=1	0.032	0.227	
	Soldier river barb	<i>C. enoplos</i>	n=1	0.071	0.254	
AT	Common Silver barb	<i>B. gonionotus</i>	n = 2	0.055 (0.05-0.06)	0.237 (0.224 – 0.237)	
	Soldier river barb	<i>C. enoplos</i>	n = 2	0.088 (0.06 -0.117)	0.235 (0.217 – 0.235)	
	Smith barb	<i>P. proctozystron</i>	n = 1	0.133	0.248	
	Siamese mud carp	<i>C. jullieni</i>	n = 1	0.100	0.312	
	Greater bony lipped barb	<i>O. melanopleura</i>	n = 1	0.192	0.211	
	Snake head fish	<i>C. striata</i>	n = 1	1.357	0.237	

The data in bracket represent the lowest – the highest value

nd = “cannot detect” due to the level of cadmium in collected samples was under limit of detection

**Table 3**

The concentration of cadmium and lead (geometric mean $n > 1$ and individual value $n = 1$) in edible portion of river fish during dry period

Sample site	Fish samples		Number of sample	Cadmium mg/kg dry weight	Lead mg/kg dry weight
	Common name	Scientific name			
NK	Common silver barb	<i>B. gonionotus</i>	n = 2	0.149 (0.144 - 0.153)	0.227 (0.219 - 0.236)
	Bronze featherback	<i>N. notopterus</i>	n = 1	0.066	0.359
	Smallscale tongue-sole	<i>C. microlepis</i>	n = 1	0.204	0.252
	Giant Bagarius	<i>B. yarrelli</i>	n = 1	0.117	0.212
CH	Soldier river barb	<i>C. enoplos</i>	n = 1	nd	0.216
	Smallscale tongue-sole	<i>C. microlepis</i>	n = 2	0.104 (0.020 - 0.188)	0.229 (0.227 - 0.230)
	Peacock eel	<i>M. siamensis</i>	n = 1	0.193	0.341
SB	Armed spiny eel	<i>M. armatus</i>	n = 1	0.082	0.227
	Common silver barb	<i>B. gonionotus</i>	n = 2	nd (nd - nd)	0.222 (0.216 - 0.228)
	Armed spiny eel	<i>M. armatus</i>	n = 1	0.141	0.484
	Snake head fish	<i>C. striata</i>	n = 1	nd	0.216
AT	Swamp eel	<i>M. albus</i>	n = 3	nd (nd - nd)	0.242 (0.231 - 0.261)
	Common silver barb	<i>B. gonionotus</i>	n = 2	nd (nd - nd)	0.262 (0.216 - 0.301)
	Soldier river barb	<i>C. enoplos</i>	n = 1	nd	0.248
	Whisker sheatfish	<i>K. bleekeri</i>	n = 1	0.034	0.658
	Spotted featherback	<i>N. chitala</i>	n = 1	nd	0.219
	Peacock eel	<i>M. siamensis</i>	n = 1	0.072	0.279
	Snakehead fish	<i>C. striata</i>	n = 2	nd (nd - nd)	0.219 (0.213 - 0.223)
	Swamp eel	<i>M. albus</i>	n = 2	0.073 (nd-0.073)	0.242 (0.217 - 0.268)

The data in bracket represent the lowest – the highest value

nd = "cannot detect" due to the level of cadmium in collected samples was under limit of detection

1.9 Cadmium concentration in fish

The concentration of cadmium in edible portions of fish in this study varied based on sampling sites and species of fish as shown in table 2. The observed concentrations of cadmium in edible portions of collected fished from 4 market sites in 4 provinces ranged from lower than limit of detection (nd) – 1.357 mg/kg dry weight. The lowest concentrations of cadmium were under the lowest limit of detection of the instrument. Some of concentrations of cadmium in fish in this study were lower than limit of detection of the instrument in both sampling period. However, within both period of sampling, the concentration of cadmium in *C. striata* from AT province during the wet season showed the highest concentration at 1.357 mg/kg dry weight. Observable concentrations of cadmium were also found in *P. hypophthalmus* (0.748 mg/kg dry weight) from SB province during wet period and *K. bleekeri* (0.612 mg/kg dry weight) from CN province during dry season respectively.

In this study, some observed concentrations of cadmium were found in the benthopelagic fish such as *C. striata*, *P. hypophthalmus*, and *O. melanopleura*. The observed cadmium concentration also found in demersal fish



such as *M. armatus* and *A. choirrhynchos*. In the wet season, the benthopelagic and carnivorous fish that had the observable concentrations of cadmium were from NK and SB province including, *A. choirrhynchos* (0.252 mg/kg dry weight), *L. blecker* (0.205 mg/kg dry weight), *M. siamensis* (0.167 mg/kg dry weight), *M. albus* (0.152 mg/kg dry weight). In the dry season, the observed cadmium concentrations were found in benthopelagic and demersal fish from NK and SB province including, *C. microlepis* (0.204 mg/kg dry weight), *B. gonionotus* (0.149 mg/kg dry weight) and *M. armatus* (0.141 mg/kg dry weight).

The Kruskal –Wallis test showed the significant differences between cadmium concentrations in fish from different sampling site in wet ($p < 0.05$) and dry season ($p < 0.05$) as shown in table 4. During wet season, the median values of cadmium in fish from each sampling site decreased in the following order: SB > AT > CN > NK. While the median values of cadmium in fish from each sampling site during dry season decreased in the following order: NK > CN > SB > AT.

Table4

The Kruskal-Wallis test of cadmium and lead concentration (mg/kg dry weight) in fish among 4 provinces during wet and dry seasons of Thailand

Province	Statistical parameters	Cd		Pb	
		wet season	dry season	wet season	dry season
NK	median value	0.0273	0.1534	0.2387	0.2363
CH	median value	0.1053	0.0821	0.3488	0.2278
SB	median value	0.1437	0.0141	0.2976	0.2317
AT	median value	0.1087	0.0124	0.2360	0.2480
	p value	0.033*	0.0074**	0.022*	0.9543
	Chi-Square	10.589	12.002	14.144	0.3297
	df	3	3	3	3

* = significance different at p value < 0.05, ** = significance different at p value < 0.01

1.10 Lead concentration in fish

The concentration of lead in edible portions of fish in this study varied among sampling sites and species of fish as shown in table 2. The observed concentrations of lead in edible portions of collected fish from 4 market sites in 4 provinces ranged from 0.211 – 1.134 mg/kg dry weight. The maximum concentration of lead in fish was found in benthopelagic fish: *M. nemurus* at 1.134 mg/kg dry weight from CN province during the dry season. Lesser concentrations of lead in fish were observed in *K. bleckeri* (0.658 mg/kg dry weight) from AT province during the dry season, *M. armatus* (0.484 mg/kg dry weight) from SB province during the dry season, *P. chonchophilus* (0.464 mg/kg dry weight) from NK province during the wet period and *M. albus* (0.410 mg/kg dry weight) from SB province during the wet season.

Some observable concentrations of lead were found in benthopelagic and demersal fish similar to the result of cadmium. During the wet period, at CN province, the observable concentrations of lead were found in demersal fish that are carnivorous fish including *W. attu* (0.379 mg/kg dry weight), *B. yarrelli* (0.318 mg/kg dry weight) and *K. bleckeri* (0.304 mg/kg dry weight) respectively. During the dry season, the observable concentrations of lead were found in *N. notopterus* (0.359 mg/kg dry weight) at NK province and *M. siamensis* (0.341 mg/kg dry weight) at CN province.

The Kruskal –Wallis test showed the significant differences between lead concentrations in fish from differences sampling site in wet season ($p < 0.05$) whereas there was no significant differences in each sampling site



during dry season as shown in table 4. During wet season, the median values of lead in fish from each sampling site decreased in the following order: CN >SB > AT >NK.

1.11 Estimate daily intake and target hazard quotient of cadmium and lead

In this study, the EDI of cadmium via fish consumption was determined as already mentioned by using the equation (1). We selected the concentrations of cadmium and lead from the fish species that contained highest concentration in each sampling site. The results were shown in table 5 which provides the daily intake of the metal during wet and dry season. The calculated EDI of cadmium varied between 0.011 – 0.573 µg/day. The highest EDI of cadmium was 0.573 µg/day, resulting from consumption of *C. striata* at AT province during the wet season. The Target hazard quotient or THQ values were calculated following the equation (2). All of THQ of cadmium were lower than 1 and the highest THQ derived from *C. striata* collecting from AT province during the wet season (0.573). However, all of the calculated EDI values of cadmium did not exceed the maximum allowable guideline level of World health organization [21] which was 7 µg/kg B.W/week or 1 µg/kg B.W/day. The calculated EDI values of lead ranged from 0.115 – 0.340 µg/BW/day as shown in table 6. The highest EDI of lead was found from consumption of *M. nemerus* at CH province during wet season. The THQ values of lead were under 1 and the highest value was 0.085 from consumption of *M. nemerus* at CH province during wet season.

Table 5

Estimate dietary intake (EDI) and Target hazard quotient (THQ) of Cd via consumption of selected fish from market

Fish species	Seasons	EDI (µg/day)	THQ
NK province			
A. choirorhynchos	wet	0.099	0.099
B. gonionotus	dry	0.072	0.072
CH province			
K. bleekeri	wet	0.136	0.136
M. siamensis	dry	0.080	0.080
SB province			
P hypophthalmus	wet	0.219	0.219
M. armatus	dry	0.045	0.045
AT province			
C. striata	wet	0.573	0.573
M. albus	dry	0.011	0.011



Table 6

Estimate dietary intake (EDI) and Target hazard quotient (THQ) of Pb via consumption of some selected fish from market

Fish species	Seasons	EDI (µg/day)	THQ
NK province			
N. notopterus	wet	0.115	0.029
P. conchophilus	dry	0.147	0.037
CH province			
M. nemurus	wet	0.340	0.085
M. siamensis	dry	0.140	0.035
SB province			
M. albus	wet	0.114	0.029
M. armatus	dry	0.152	0.038
AT province			
C. jullieni	wet	0.122	0.031
M. bleekeri	dry	0.179	0.045

DISCUSSION

The concentrations of cadmium as mg/kg wet weight in some fish that exhibited the relative high concentrations, including *C. striata*, *P. hypophthalmus*, and *K. bleekeri* were 0.34 mg/kg wet weight (moisture content was 75% and converse factor was 0.25), 0.13 mg/kg wet weight (moisture content was 83% and converse factor was 0.25) and 0.07 mg/kg wet weight (moisture content was 87% and converse factor was 0.13) respectively. These concentrations of cadmium were higher than the permissible limit concentration in fish that proposed by the European community (EU) (0.05 mg/kg wet weight) [22] and United States food and drug administration (USFDA) (0.01 – 0.21 mg/kg wet weight) [6]. The observable cadmium concentrations from these fish indicated the potential risk to human who consume these fish. The concentrations of lead found in fish as mg/kg wet weight in this study did not exceed the concentration of EU (0.30 mg/kg wet weight). The highest concentration of lead that found in *M. nemerus* as wet weight was 0.200 mg/kg which was under the permissible limit level of EU. The observed cadmium and lead concentrations in several fish species may have been from contaminated river water and sediment. Since, most of collected fish in this study were caught from Chao Phraya River, the content of cadmium and lead may have resulted from contaminated water and sediment in Chao Phraya River. A study of the concentrations of heavy metals in Chao Phraya River that was conducted by Wijaya et al [10] demonstrated that contamination of cadmium and lead in the river sediment and water column in Chao Phraya River occurred from anthropogenic activities, particularly the point sources from road site dust and fly ash.

The observed concentration of cadmium in this study was higher than the study conducted in Malaysia by Baharom and Ishak [6]. However, some studies reported the mean concentrations higher than this study including, Rahman et al [4] (mean 0.30 mg/ kg dry weight) and Islam et al [23] (mean 0.84 mg/ kg). The lead concentrations in fish in this present study were lower than some reports, including Rahman et al [4] (4.64 mg/ kg dry weight) and Islam et al [23] (0.74 mg/ kg dry weight). From several studies, it should be noted that the variation of heavy metals in fish can be attribute to the variation species of fish and the sampling area.

The content of cadmium and lead in fish in this study varied among species of fish which was similar to a study of Rahman et al [4] and Baharom and Ishak [6]. Rhaman et al [4] showed a significant difference of heavy



metal among fish species. A study of Baharom and Ishak [6] indicated that the mean concentrations of heavy metals in fish tissues were different among species. This observation could be explained by the feeding behavior and their habitat characteristic of the fish species. In this study, the presence of lead and cadmium content in benthic-pelagic such as snake head fish, striped catfish and demersal fish such as swamp eel, small scale tongue-sole and long-nose loach and yellow catfish was similar to a report of Boscher et al [24] which indicated that the species of fish such as stone loach that live most time near sediment could be directly expose to pollutants particularly heavy metals. Therefore, heavy metals can accumulate in demersal fish higher than the species that live in pelagic area of river. The feeding behavior of fish that associate with their habitats may influence the accumulation of heavy metals. Since the fish such as stone loach and swamp eel live in sediment area, their food should be captured from sediment and they may be expose to heavy metal by gill absorption and consumption of contaminated foods which consequently accumulate in kidney and muscle [25]. Cadmium and lead have high potential to accumulate from sediment into fish due to the fact that the bio-concentration factor of cadmium between sediment and fish are high [24], therefore, the accumulation of heavy metals in benthic-pelagic and demersal fish could be observed.

In addition, the feeding habits of fish may influence the bio-concentration in fish. The observed high content of cadmium and lead in carnivorous fish such as *C. striata*., *M. nemurus* and *K. bleakeri* [19] may be due to the bio-magnification of heavy metal further up to the trophic level [26]. A report of Jabeen et al [26] showed the level of several heavy metals that were found in carnivore fish higher than in herbivore fish which indicated the bio-magnification of heavy metals through the trophic level of the river ecosystem.

The significant different of cadmium concentrations between sampling site during wet and dry period indicated the different concentrations of cadmium were attribute to the location where fish were caught. The different of location where the fish were caught may have the different of water and sediment concentrations of heavy metal. Chao Phraya River differed among sampling sites, indicating the difference of anthropogenic input in each location. The sources of pollutions that contaminated to aquatic system come from 2 major point sources, including non-point sources (road run-off and street dust) and point sources (discharge from household and industrial waste water) [27]. Thus, the different of cadmium and lead concentrations in fish in this study among sampling sites may have been influenced by different human activities near Chao Phraya River. Heavy metal pollution in river or water sources may be attributed to the use of several agricultural chemicals in the areas near Chao Phraya River. The selected provinces in this study including, Nakhon Sawan, Chainat, Sighaburee and Angthong are the areas that contain high amount of rice field. The heavy metals polluted in river that surrounded by the rice fields may result from the leaching of fertilizer, pesticide, fungicide from the rice fields [3]. During wet season, the median values of cadmium concentrations in edible portion of fish were higher than dry season. This result could be inferred that the location of sampling area in difference period may influence the concentrations of cadmium. Interestingly, during wet season, the median values of cadmium and lead at SB province higher than the other sampling areas suggesting the concentrations of metals in fish may associate to the location of the market. The SB provinces are the downstream area of Chao Phraya River, the polluted water in river may increase because of the downstream of Chao Phraya River surrounded by higher number of road site and big city when compared to the upstream area. The more polluted of downstream area of Chao Phraya River may attribute to the high density of non-point sources and point-sources of pollutions. A number of fish that were caught from downstream river may contaminate the higher concentrations of cadmium than upstream river. However, the different result of cadmium concentration in fish was observed during dry season. The lowest median concentration of cadmium was found in AT and SB province. This may influence by the hydrological characteristic of water in Chao Phraya River during the dry season and the different human activities around the sampling area. The significant different concentrations of lead among sampling site were observed only in wet season. The highest median value of lead was found in CH followed by SB province which was similar to result of cadmium in wet season. This may reflect the problems of



activities surrounded CH and SB province. There are several anthropogenic activities in SB province that could ascribe the bio-concentrated of heavy metal, including industrial estate, brick kiln activities and domestic waste water. Another factor such as transportation, contaminated fish containers and the environment in the market may influence the accumulation of heavy metal in fish.

The EDI value was performed to obtain the data about human exposure. Food ingestion is one of the important routes of cadmium and lead exposure. Therefore, the EDI value should be applied in order to see whether the contaminated fish increased the health risk to people who consumed them. The calculated EDI values in this study derived from selected fish that possessed highest concentrations of cadmium and lead in each sampling site were lower than permissible limit level that given by the WHO. It could be assumed that the concentration of cadmium and lead were safe for the consumption of these fish. The target hazard quotient (THQ) is the model that has been proposed by the WHO in order to use for risk assessment. The obtaining THQ values were lower than 1 indicating the safe margin of consumption of fish. However, if people consume more than one fish species, the risk may likely increase due to the fact that the sum of THQ values from each fish showed the higher level. The THQ value that greater than 1 indicated the potential risk to have adverse health effect resulting from consumption of contaminated fish species. Even though the obtained data in this study indicated the low health risk from consumption of fish, the monitoring of heavy metal contaminated in several food stuffs should be considered due to the fact that the accumulation of risk can occur by consumption of diverse contaminated foods.

CONCLUSION

This present study revealed the contaminations of cadmium and lead in several fish species that were collected from open market near Chao Phraya River. The concentrations of cadmium and lead in edible portion of fish varied among fish species and sampling sites. The concentrations of cadmium as mg/kg wet weight that were higher than permissible level of EU were found in benthopelagic and demersal fish which were mostly are carnivorous fish.

Similarly, the observable concentrations of lead were found in benthopelagic and demersal fish which mostly are carnivorous fish. However, the concentrations of lead in fish as mg/kg wet weight did not exceed the permissible level of EU and USFDA. The different concentrations of heavy metal between sampling sites could be related to anthropogenic activities surrounded each sampling area. The concentrations of cadmium and lead in 20 species of fish in both wet and dry seasons obtained in this study could be used as the data base for further monitoring the river fish. The obtained EDI and THQ values in this study were within safe level, suggesting the low risk for local people consuming contaminated fish. However, the local inhabitants should avoid consumption of benthopelagic and demersal fish that are carnivorous fish for a long time due to the higher concentrations of cadmium and lead were observed. The data from this study suggest that levels of cadmium and lead in fish should be monitored the regularly in order to sustain the healthy food sources for local inhabitants.

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FACTORS ASSOCIATED WITH VIOLENCE BEHAVIOR OF ADOLESCENTS IN UDON THANI PROVINCE

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ABSTRACT

This study aimed to examine factors associated with violence behavior of adolescents in Changwat Udon Thani, and to investigate sizes of proportion, types, and behavior of adolescents in Changwat Udon Thani. The sample consisted of 250 at-risk adolescent, obtained using the multi-stage random sampling technique. The sample used in interviews consisted of 10 people, obtained using the purposive sampling technique. The instruments used were a questionnaire and an in-depth interview form. The quantitative data were analyzed for mean, standard deviation, percentage, correlation, Mann-Whitney U test, and median \pm IQR ; and logistic regression analysis. Whereas, the qualitative data were analyzed by the uses of category analysis and content analysis

The results of quantitative data analysis were the following 6 variables with potential association with having clear violence behavior (p-value \pm 0.250) : gender, age, higher level of education, size of alcohol consumption proportion, context of alcohol consumption, and type of alcohol consumption. There are 3 highest ranks of consumption were : local whisky of Different trademarks, beer of different trademarks, and colorless whisky respectively, Whereas, the size of alcohol consumption proportion found the least was satho or sake (alcohol drink made from glutinous rice or breadfruit). The first 3 highest ranks of consumption were : at Songkran Festival, in pubs, and on party days among friends respectively. The first 3 highest ranks of consumption were : beer of different types, blended whisky, and colorless whisky respectively. Whereas, the least was special whisky in the type of Kaoliang or Siangshun or Chinese whisky of other trademarks.

The results of qualitative data analysis revealed the following : The young people had alcohol consumption approximately twice per week by friends inviting to drink the most and by drinking together at different festivals in the community. They used the places for alcohol consumption at their friends' houses, dormitories and places of entertainment in the provincial city as well as at shops in general. The period of time for drinking the most was in the evening. The alcohol consumption types were beer and colorless whisky because these things were cheaper than the alcohol of the other kinds. Next to most they consumed was satho.

Keywords : A Study of Association of Alcohol Consumption Propitious Affection Violence Behavior of Adolescents in Changwat Udon Thani



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INTRODUCTION

According to the National Statistical Office's survey, in 2015 there were 18.61 million Thai people aged 11 or over, or 29.13% of the total population, 63.88 million. The size of the proportion of alcoholic beverage consumption was total estimated 3,691 million liters. The value is not less than 150 billion Baht. To further analysis, the average consumption of alcoholic beverages was 41.6 liters per capita per year in 2001, In 1989, the average drinking rate was 20.2 liters per year. The per capita beer consumption per capita increased more than 5 times from the average 4.4 liters per capita in 1989 to 24.8 liters per capita in 2001.

To recognize the importance of drinking alcohol and the violence of adolescents in Udon Thani. The results of this study are expected to be beneficial on awareness of the issues and problems of violence of the next generation. In addition, the research results are expected to be useful in disseminating knowledge to the wider society. To find solutions to prevent and solve common problems included the finding ways to develop into the work related to the violent problem of adolescents seriously. This is an important task of the organization and related departments.

The research objectives were : To study examine factors associated with violence behavior of adolescents in Changwat Udon Thani, and to investigate sizes of proportion, types, and behavior of adolescents in Changwat Udon Thani.

LITERATURE & THEORY

Thailand is the country where the average person consumes pure alcohol per capita. According to the World Health Organization's WHO database on alcohol consumption, the Food and Agriculture Organization (FAO) calculates the per capita annual alcohol consumption of the population. In 2000, the Thai per capita consumption was 13.59 liters It is ranked 5th in the world after Portugal. The Republic of Ireland, the Bahamas and the Czech Republic, respectively, are much higher than countries that are well-known for drinking, such as France, Germany, Russia, Britain, the United States and Japan. It is noteworthy that Thai people have nearly doubled their alcohol consumption in the last 10 years. In 1990 Thai people consume pure alcohol per capita per year, only 7.46 liters

Based on the data collected from teenagers' follow-up and research data from adolescents, and with the experience of the agency in both schools and hospitals, there is an interest that alcohol or alcohol consumption among adolescents how much alcohol consumption affects adolescent violence in Udon Thani is According to statistics, the information appeared in many sources is day by day, the violence of adolescents will be more complicated including the age of drinking less. However, even teenagers will know that alcohol drinking is a common perception drinkers will have to pay extra for their living expenses. In medical, alcohol drinking affects the health of drinkers in mostly negative rather than positive. But the interest in this study is to study of the actual data to explain the perception of drinking behavior among adolescents. In this regard, the research team as an department plays an active role in helping the campaign to jointly prevent problems. Therefore, it is necessary to study the violent behavior of adolescents caused by drinking alcoholic beverages. The study of data from both size, proportion, type and context of alcoholic beverage is aimed at the knowledge that has been developed as knowledge to publish to the public organization ,NGOs relevant agencies and the public.



RELATED WORKS OR DISCUSSION

In this research, there are issues that can be separated into data analysis and then discussed in the research as follows.

I. Quantitative Analysis

1.1 Variables related to violent behavior of adolescents in Udon Thani. (y)

There are three variables: higher education level than secondary school Size of alcohol consumption(X4) And higher age(X2). This may be because secondary school graduates have reached a higher level in the metropolitan area, technology College The Balinese vocational education, etc., which corresponds to the study of the sages. Punjab and Wong (2004) studied the psychosocial and psychosocial factors of drug use behavior among vocational students. Udon Thani Province Personal factors such as gender, age, residence and school were correlated with substance use behaviors of vocational students statistically significant at the .05 level.

1.2 Size of Alcohol Consumption Share of Adolescents in Udon Thani ,the first three most common alcoholic beverages were beer, spirits and white spirits, respectively. The proportion of alcohol consumption among adolescents in Udon Thani was the lowest, namely Sato or Sake, which was consistent with the study of the psychiatric group. The study of drug use among students in Sukhothai (1997). Recondition of the academic year 1997, Sukhothai Vocational College The results showed that. Alcohol, beer is the most common in 35.10% and the results of Boonserm Hutaphat and kitvipa Suwannarat (2003) have studied the effects of alcohol on the basis of factors related to domestic violence. The study indicated that most alcoholic and alcoholic drinkers are drunk and educated. Teens' drinking habits during social and cultural activities are divided into two periods: first, daytime activities. The liquor is white liquor bought from the village shop. During the night associated with the festive amusement, liquor is a popular drink is brewed white beer purchased from the sale. It also corresponds to the study of Jintana wongwan (2558) who studied the prevalence and behavior of alcohol in High school students in Khon Kaen. The results showed that alcoholic student most of the drink is currently Beer (39.8%), followed by wine and spirits (27.9%, 18.6%).

1.3 The alcohol consumption of adolescents in Udon Thani province was the third most consumed;. Songkran festival In pubs and social occasions between friends, respectively, the context of alcohol consumption among adolescents in Udon Thani was the lowest, which was consistent with the study of Jintana Wongwan (2005) studied the prevalence and behavior of alcoholic beverages in high school students in Khon Kaen. The results showed that. Students drink alcohol at festivals, 43.0%, Drink in a party with friends 28.8 percent% ,and night place is a pub, bar, karaoke and discotheque.

1.4 The types of alcohol consumption among adolescents in Udon Thani province, the first three drinkers were beer, spirits mixed with light, ginseng, Mekong, and white spirits, respectively, and alcoholic beverages of adolescents in Udon Thani. Most is Special liquors of Chinese cabbage, Xian Chun or other Chinese liquors. This is consistent with the study of the psychiatric group. The study of drug use among students in Sukhothai (1997). Recondition of the academic year 1997, Sukhothai Vocational College The results showed that. Alcohol, beer is the most common, 35.10%, and the results of Boonmee Hatta and Kvitvisa Suwannarat (2003) have studied the effects of alcohol on the basis of factors contributing to domestic violence. The study found that Most drinkers and alcoholic drinkers are Drinking and Education of Supa and Stand (2003) studied alcohol with the community. The drinking of alcohol. During the period of social and cultural activities, it was divided into two periods. The first was a day activity. The liquor was white liquor bought from the village shop. For the night. The most popular alcoholic beverage is the white beer purchased from the sale. In addition, it is consistent with the study of Jintana Wongwan (2005) studied the prevalence and behavior of alcoholic beverages in high school students in Khon Kaen. The results showed that. Alcoholic Student Most of the drink is currently Beer (39.8%), followed by wine and spirits (27.9%, 18.6%).



1.5 The impact and behavior of alcoholic beverages of adolescents in Udon Thani province were the highest. The first three groups were dysphagia, alcoholism and adolescent alcohol consumption among adolescents in Udon Thani. Is Do not want to study This is consistent with the study of the Institute of Medical Sciences, Chulalongkorn University (2001: 183-186). The study on problems related to alcohol consumption. To find alternative preventive measures. The results indicate a clear empirical effect on individuals and societies. It can be seen from the health problems that lead. Impact victims to the hospital. And the case of controversy, accidents or accidents. Quite intense The lawsuit and court case. For the impact on the drink. The cause of unrest in the family and society. Usually occurs in a controversial manner. This effect has a dramatic increase in chronological order. Along with the social, economic and health impacts

II. Qualitative analysis

2.1 Content Analysis from In-depth Interview, the size of the proportion of alcohol consumption among adolescents in risk groups in Udon Thani. Consumers drink alcohol almost twice a week, with friends most likely to drink. And drink in the festivals in the community. The analysis is consistent with the results of the quantitative data article 1.3

2.2 Content analysis results from in-depth interviews. Interview) The alcohol consumption context of adolescents at risk. Adolescents use places to consume alcoholic beverages, most of which are home to friends, dormitories, as well as in entertainment venues such as pubs and general stores. By the time of drinking, the evening was in noisy place, no people. The analysis is consistent with the results of the quantitative data article 1.3

2.3 Content Analysis for In-depth Interview The most common types of alcohol consumption among adolescents were Beer with white liquor because it is cheaper than other types. The second order of drinking was SATO. The analysis was consistent with the results of the quantitative data article 1.5

2.4 Category Analysis: In-depth Interview The effects and behavior after alcohol consumption of adolescents in risk groups in Udon Thani province can be summarized into 3 aspects as follows

2.4.1 Physical effects Behaviors after alcohol consumption among adolescents are at risk. When drunk, I will not be aware. Analyzing is consistent with the results of quantitative data studies in Section 1.6. In addition, some people affect the sexuality, which may be due to belief in the subject. Brave They have the courage to express themselves as well as the expressions that they want to be accepted among their adolescents, which may be challenged during the consumption of alcohol.

2.4.1 Psychological impact Behaviors after alcohol consumption among adolescents are at risk. Teens are not numb. Damned between groups. There are sad symptoms, which may be due to disappointment, and then teenagers use alcoholic beverages as a way out later. This may change the personality of their own. Rude Sometimes quarrels with parents, including those in the same family. These are so Overall, psychological impact analysis based on qualitative data is consistent with the results of the quantitative data study in Section 1.6.

2.4.3 Sexual effects Behaviors after alcohol consumption among adolescents are at risk. Sexual relationships with close friends or girlfriends, and most of them are mutual friendships, which are considered friends in both the same institution and similar institutions in the province. After consuming alcoholic beverages in the group, they are invited to eat at the night entertainment venue. Some people have sex with a female service while intoxicated. Some people have abuse with a guy who is a type two girl. And some have raped their own fans in the 15 to 1 style, which may be influenced by the media, including such as pornographic films. Internet media Overall, the results of gender analysis are consistent with the results of quantitative data in Section 1.6.



METHODS

A. Study design

This research used mixed method to conduct the operation. It was the mixture of qualitative research and quantitative research.

B. Participants

By the multi-stage random sampling technique. The sample consisted of 250 at-risk adolescent, and obtained using the purposive sampling technique. The sample used in interviews consisted of 10 people

C. Procedures

The instruments used were questionnaire on Oct.1,2016 to Jan,31,2017 and were Indepth interview on Jan,1,2017 to Feb,2,2017. Statistical analyses were carried out with the statistical package program. The quantitative data were analyzed for mean, standard deviation, percentage, correlation, Mann-Whitney U test, and median \pm IQR ; and logistic regression analysis. Whereas, the qualitative data were analyzed by the uses of category analysis and content analysis

RESULTS

The results of the study were as follows;

I. The results of quantitative data analysis

1. There were the following 6 variables with potential association with having clear violence behavior (p-value \pm 0.250): gender, current age, higher level of education than secondary education, size of alcohol consumption proportion, context of alcohol consumption, and type of alcohol consumption.

2. There were the following 3 variables with association with violence behavior of adolescents in Changwat Udon Thani : higher level of education than secondary education, size of alcohol consumption proportion, and getting older. Association of violence behavior of adolescents in Changwat Udon Thani could be explained as following:

2.1 The adolescents with higher level of education than secondary education would have an opportunity to have clear violence behavior 31.18 times(95% ; CI : 4.60, 211.41) of the adolescents with education at the secondary education level or lower when controlling influences of age and score on the size of alcohol consumption.

2.2 Every 1 year of getting older of the adolescents would cause an opportunity to increase clear violence behavior at 63%(95%, CI : 21%, 119%) when controlling influences of level of education and score on the size of alcohol consumption proportion.

2.3 Every 1 score on the size of alcohol consumption proportion which increased would cause an opportunity to decrease clear violence behavior at 14% (95% ; CI : 6%, 22%) when controlling influences of level of education, and age.

3.The sizes of alcohol consumption proportions of the adolescents in Changwat Udon Thani in the first 3 highest ranks of consumption were : local whisky of Different trademarks, beer of different trademarks, and colorless whisky respectively, Whereas, the size of alcohol consumption proportion found the least was satho or sake(alcohol drink made from glutinous rice or breadfruit).

4.The alcohol consumption contexts of the adolescents in Changwat Udon Thani in the first 3 highest ranks of consumption were : at Songkran Festival, in pubs, and on party days among friends respectively. However, the consumption contest found the least was making a sacrifice for the guardian spirit of the land.

5.The alcohol consumption types of the adolescents in Changwat Udon Thani in the first 3 highest ranks of consumption were : beer of different types, blended whisky, and colorless whisky respectively. Whereas, the consumption type found the least was special whisky in the type of Kaoliang or Siangshun or Chinese whisky of other trademarks.



6. The impact and behavior of alcoholic beverages of adolescents in Udon Thani province were the highest. The first three groups were hand tremble, furious and quarrel respectively. For Impact and Behavior behind alcohol consumption of adolescents in Udon Thani is not like to study.

II. The results of qualitative data analysis revealed the following

1. The result of Content analysis from indepth interview

1.1 The sizes of alcohol consumption proportion of the at-risk adolescents in Changwat Udon Thani could be summarized that most of these young people had alcohol consumption approximately twice per week by friends inviting to drink the most and by drinking together at different festivals in the community.

1.2 The alcohol consumption contexts of the at-risk adolescents could be Summarized that these young people mostly used the places for alcohol consumption at their friends’ houses, dormitories and places of entertainment in the provincial city as well as at shops in general. The period of time for drinking the most was in the evening.

1.3 The alcohol consumption types of these adolescents that consumed the most were beer and colorless whisky because these things were cheaper than the alcohol of the other kinds. Next to most they consumed was satho.

2. The result of Category Analysis from In-depth Interview, the effects and behavior after alcohol consumption of adolescents in risk groups in Udon Thani province can be summarized into 3 aspects as follows:

2.1 Physical effects were found that behaviors after alcohol consumption among adolescents at risk are drunk, not be aware, wound up. It causes of fight and some people have sex.

2.2 Psychological impact was found that behaviors after consuming alcoholic beverages of adolescents are teens not numb, damn sad which change own personality from previously and rude. Sometimes quarrel with parents.

2.3 Sexual effects were found. Behaviors after alcohol consumption among adolescents are at risk are to have sexual relations with close friends or girlfriends, and most have mutual affection. Some people use sexual services with female service. Some people have an abusive relationship with a male friend. And some have raped their own fans in the 15 to 1 style.

CONCLUSION AND FUTURE WORK

1.6 The impact and behavior of alcoholic beverages of adolescents in Udon Thani province were the highest. The first three groups were dysphagia, alcoholism and adolescent alcohol consumption among adolescents in Udon Thani. Is Do not want to study This is consistent with the study of the Institute of Medical Sciences. Chulalongkorn University (2001: 183-186). The study on problems related to alcohol consumption. To find alternative preventive measures. The results indicate a clear empirical effect on individuals and societies. It can be seen from the health problems that lead. Impact victims to the hospital. And the case of controversy, accidents or accidents. Quite intense The lawsuit and court case. For the impact on the drink. The cause of unrest in the family and society. Usually occurs in a controversial manner. This effect has a dramatic increase in chronological order. Along with the social, economic and health impacts Sexual effects Behaviors after alcohol consumption among adolescents are at risk. Sexual relationships with close friends or girlfriends, and most of them are mutual friendships, which are considered friends in both the same institution and similar institutions in the province. After consuming alcoholic beverages in the group, they are invited to eat at the night entertainment venue. Some people have sex with a female service while intoxicated. Some people have abuse with a guy who is a type two girl. And some have raped their own fans in the 15 to 1 style, which may be influenced by the media, including such as pornographic films. Internet media Overall, the results of gender analysis are consistent with the results of quantitative data in Section 1.6.



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DEVELOPMENT OF HAIR CREAM OF COCONUT OIL VIRGIN

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ABSTRACT

The purpose of this research was to develop a hair cream of coconut oil. The coconut oil was extracted by cold pressing method. Hair creams of coconut oil prepare 3 formula cream bases and mix coconut oil. Test stability hair cream Of 3 formula from irritation test subjects, 10 were found to be non-irritating and test their satisfaction with the volunteer of 50 found that subjects found the formula 1 most are satisfied and formula 2, 3 respectively.

Keywords: hair cream, coconut oil, satisfaction.

INTRODUCTION

Coconut is an important herb in Thai medicine. The records from Ayutthaya dynasty, the coconut to use treat the skin disease. (Nevin K,2010) Coconut has the scientific name *Cocos nucifera* L. var. *Nucifera*. Botanical characteristics: Tree height 20-30 m. Hard-shelled gray bark with leaves and feathers. The lanceolate is 3.5 cm long, 80-120 cm long. The base of the leaf and the tip of the leaf edge smooth, smooth leaves green to it. The stem is large, spread out over the trunk, the flowers are branched into small pods. The petals are reduced to 4-6 in a bouquet of both male and female flowers Female flowers at the end of the bouquet. Female flowers are at the base of the flower without stem, round shape or smooth skin, soft, green to brown. The middle shell is soft fibers. Hard in the shell. The next layer is soft white flesh. Coconut oil used to cure eczema and wound caused by cold or heat and used to treat skin diseases. (kongkanda, 1997) (Verallo-Rowell,2008). It is also used to treat dry skin, scaly and very pure. Coconut oil can be classified into two main types: coconut oil (RBD Coconut Oil) and coconut oil (Virgin Coconut Oil). Coconut oil is commonly known as used to fry food or in the production of food. Coconut oil is produced from copra. The extracted oil must be refined, bleached and deodorized before being consumed. Virgin coconut oil has a very sophisticated production process called Cold Process or Cold Pressed because it does not use heat. High quality oil. It is rich in vitamin E and antioxidants and is said to have many health benefits. (Hong, .(2002 The benefits of coconut oil affect the skin. Coconut oil is used to moisten the skin. (Evangelista, 2014). Coconut oil products such as cream and lotion will make the skin soft, moist and smooth. Coconut oil contains more vitamin E than vitamin E in cosmetics (Yeap, 2014)., help prevent and cure melasma and freckles are one of the causes of melasma. (Vaughn, 2018). Vitamin E in coconut oil acts to destroy these free radicals (Lin, T, 2017). Coconut oil is a good sunblock. It is not sticky like some sunscreen, hair beauty because coconut oil is a vegetable oil with moisturizing properties and antibiotics and antioxidant. Coconut oil is a hair conditioner that makes the hair soft and shiny. Vitamin E helps to promote the growth of hair. (chasan, 2005) (Rele AS, 2003)



LITERATURE & THEORY

Emulsions are a disperse system consisting of two immiscible liquids, one with a small droplet called the phases. disperse phase or internal phase is in the bad one, called the continuous phase (external phase) and emulsifier (emulsifier) is a stable emulsion. In general, the dispersion drops are in the range of 0.1-10 μm in pharmaceutical form. Cream is a type of emulsion. High viscosity. Oil phase, fatty alcohols are the viscosity control of the trimer. These substances cause skin and skin absorption. Cetyl alcohols, stearyl alcohols, or both are used together. They also contain oleyl. alcohols, isostearyl alcohols, myristyl alcohols. Fatty acids regulate the viscosity of fatty alcohols and can be dissolved into soaps, which are emulsifiers. Saponification occurs during the preparation, such as stearic acid, which is a sterile soap. Make a cream o / w type. Waxes may be derived from plants, animals or the oil industry, such as bee wax, ceresin wax, paraffin, lanolin, etc. It is also used as an emollient by emulsifying the skin (Govindan, 2010) and viscosity additives to the cream. Oils act as a moisturizing agent and the skin is not dry. By the same token, the skin of the skin is light mineral oil or liquid paraffin. It may be a key ingredient in cleansing cream. Vegetable oil (not easily rancid) or natural oils such as Jojoba oil, Avocado oil, Macadamia nut il, meadowfoam oil, Apricot cream oil oil (Ghani, 2018).

2.1. Water phase

- Moisturizers and Moisturizers Moisturizers (moisturizers) is a substance that makes the skin soft and moist. The skin can be treated for a reasonable amount of time. Humectants are substances that absorb water. The water does not evaporate from the skin too quickly. Help add moisture to the skin It also acts to prevent the loss of water from the cream. The cream does not dry easily. When Gabe is long. This helps stabilize the product. This substance is a moisturizer, including polyols such as propylene glycol, glycerol, and sorbitol, because they are safe for non-toxic skin. All three types of propylene glycol have a low molecular weight. Low viscosity, high volatility, high glycerin, high molecular weight sorbitol. High viscosity and non-volatile. It should be used in accordance with the formula.

- Poly eaters such as glyceryl monostearate, which act as There are also sorbitan eaters, especially monostearate, which usually produces w / o emulsion. However, when used in combination with ethoxylate products and may produce o / w emulsions, polyethylene is the preferred form of polyethylene. glycol esters with different fatty acids together in preparation. Fatty acid acts as a good emulsifier. Short-chain fatty acid acts to increase the viscosity of the cream (thickener)

- Water soluble (water solution compound)

Sterile water, such as Water for Preparation or Deionized Water,

2.2. Emulsion:

Surfactant is a synthetic substance. There are several types.

Anionic surfactant is used in most skin creams such as triethanolamine, sodium lauryl surfactant, sodium cetearyl sulfate, cocoyl isoethinoate, potassium cetyl phosphate, etc.

- cationic surfactant. This substance is used as a preservative. Disinfectant or use in hair conditioners. Products containing acidic pH will use this substance well. Cream for the skin to be sensitive to allergies and irritation. Quaternary ammonium compound.

- noionic surfatnr. These substances are commonly used in conjunction with negative or positive emulsifiers. To better condition the cream, such as face cream, not dry. The wood loses water from the face cream. They are often esters in the long chains, including Ethoxylated Fatty Alcohol, PEGs, Fatty Acids, Ethoxylated Mooglycerides, Sorbitan Monooleate, Saturate Sequioleate. (Rohman, 2009)

- Amphoteric surfactants are not commonly used as emulsifiers in conventional creams. This substance will become positively or negatively charged when pH is changed and may react with other substances in the formulation.

Surfactants used in conventional creams are usually anionic surfcant or nonionic surfactant.



Polymer is used as a stabilizer for creams such as carbomers. Polymers are natural substances such as acasia, trgacanth, xanthan gum or synthetic polymers such as methyl cellulose, hydroxyethyl cellulose or other polymers. Such as gelatin, etc. This polymer dissolves well in water, forming a film with a particle size around the drop. Prevent the fusion of particle drops. The stabilizer and the rest of the emulsion (Nubphamas, 2012)

METHODS

Bring fresh coconut to scrape using coconut scraper. Coconut grains are scraped and put into a mesh bag and manual press. Leave it for culturing for 20 hours. The ingredients are separated into 3 layers. Coconut oil is the middle layer. The oil is very well separated. Repeat 3 cycles. Calculate the percentage of extract (% Yield). Test physical properties such as pH. Because of the decomposition of the formulation, the pH of the formulation may change. The instrument used to measure the pH meter is a physical test such as stratification or precipitation. Test the body A physiological test is a test of whether the product is harmful or harmful to the body, such as allergic reactions. The patch test for sensory tests such as color, odor, texture, texture of the cream. Test the quality of the performance of the product (performance test) to test the stability of the cream. The freezing and thaw cycle were carried out by storing the cream in an oven at 45 ° C for 24 hours and stored in a refrigerator at 25 ° C for 24 hours alternately for 5 cycles. Change the physical appearance, such as texture, color, pH, to determine the effect of temperature changes on cream storage. Volunteer Satisfaction Test on 50 products by volunteers who evaluated their satisfaction including soft hair, shine, smell, color, overall satisfaction. The criteria are 1-5.

Table 3.1 shows the coconut oil cream ratio.

No	Ingredient	Remedy) 1 %(	Remedy) 2 %(	Remedy) 3 %(	Phase
1	CME	3.16	3.16	3.16	Oil
2	Dehyquat ac	5.4	5.4	5.4	Oil
3	Wax-ab	9.95	9.95	9.95	Oil
4	Cetyl alcohol	7	7	7	Oil
5	Coconut oil	10	20	30	Oil
6	Distillate water	64	54	44	Water
7	Perfume	qs	qs	qs	Water
8	Uniphen p-23	0.49	0.49	0.49	Water

Performance test. Volunteer Satisfaction In the assessment will use volunteers. The age of 18-25 years was 50 using half-hair test method.



1. Difficulty - easy to distribute on the hair.
2. Difficulty - easy to wash off the hair.
3. Difficulty - easy to comb while wet
4. Difficulty - Easy to comb while dry
5. Hair condition after use, such as softness, shine.

The criteria are 1-5.

Most = 5 points

Very = 4 points

Moderate = 3 points

Less = 2 points

Minimal = 1 points

Physiological test is a test of whether the product is harmful or harmful to the body, such as allergic reactions. Or irritant or not by patch test.

Stability test The freezing and thaw cycle was applied by storing the fermented cream at 20 ° C for 48 hours and then at 25 ° C for 48 hours. The test is 6-8 rounds and then evaluated. Test for Safety and Physical Characteristics of Coconut Hair Cream (Asawachai, 2010)

3.1 Physical Stability Assessment Notice the appearance of the cream. Separation, precipitation and odor PH-value test of the product when prepared. And over a month, stored at room temperature.

3.2 Evaluate the stability of the product at 5 cycles of freeze and thaw cycle by keeping the product in a temperature and humidity cabinet set at 4 ° C for 48 hours at 48 hours. Set the temperature to 45 ° c for 48 hours, a round of 5

3.3. Irritation Test Product Introduction (Djokic-Gallagher, Rosher, Walker, & Hart, 2012)

3.3.1 Selection of volunteers aged between 20-50 years with no history of allergy And no skin disorder in the inner arm.

3.3.2 Wipe the inner surface of the inner arm with clean water until dry.

3.3.3 Use a cotton swab containing 1 test substance (1.0 milligrams) and place it on the inner arm and cover it with occlusive patch. The test tube used is distilled water, cream and coconut oil.

3.3.4. Dry for 24 hours. Wash with clean water and allow to dry.

3.3.5 Read and Record Results

3.3.6 Observe the results after the first 24 hours. If there is a redness, observe for 3-4 days. Confirm the change of the skin as shown in Table 1.



Table 3.2 shows the skin change configuration.

Score	Score of skin changes
0	no change of skin (Normal skin)
1	little red skin
2	medium red skin There may be swelling at the edges. And blistering may appear.
3	medium red skin with blistering swelling
4	Very red skin with severe swelling. And clear water.
5	severe allergic reaction Spread out around the test area.

3.4. Evaluation of volunteer satisfaction with coconut oil

- 3.4.1. 30 volunteers aged between 20-50 years were required and no scars on the skin.
- 3.4.2 Wash and rinse with clean water until dry.
- 3.4.3 Shalom fermentation cream on the left head hair volume 5.0 g
- 3.4.4 Leave for 5 minutes and rinse with clean water.
- 3.4.5 Record of Satisfaction, Comparison Table 2

Table 3.3 shows the satisfaction profile of coconut oil

Satisfaction	very good	good	fair	should be improve	Not worth using
Softness of Hair					
Shine					
smell					
color					
Overall satisfaction					

Not worth using = 1, should be improved = 2, fair = 3, good = 4, very good = 5



3.5. Statistical Analysis

One-way anova was performed with significant difference at $p < 0.05$.

RESULTS

Evaluation of physical stability and stability of coconut oil

Coconut oil in preparation 1 was prepared in a condition that was after preparation, left for 1 month, Freeze and thaw, left for 2 months with a pH of 5.41 ± 0.109 , 5.48 ± 0.015 , 5.52 ± 0.022 , 5.52 ± 0.036 , respectively. There was no stratification and precipitation. The aroma of coconut was crushed with 2 tablespoons of ginger in various conditions. After preparation, leave for 1 month, freeze and thaw, leave for 2 months with a pH of 5.71 ± 0.023 , 5.76 ± 0.032 , 5.76 ± 0.018 , 5.76 ± 0.016 , respectively. There was no stratification and precipitation of coconut aroma. and thaw, leave for 2 months with a pH of 5.96 ± 0.012 , 5.69 ± 0.034 , 5.69 ± 0.024 , 5.69 ± 0.053 , respectively, without stratification, sedimentation and aromatic coconut.

Storage conditions	Remedy	pH±SEM	The texture of the cream.	Stratification	Smell	Sedimentation
Fresh	Remedy1	0.109±5.41	White	No stratificatio	Scent of coconut	not precipitated
	Remedy2	0.023±5.71	White	No stratificatio	Scent of coconut	not precipitated
	Remedy3	0.012±5.96	White	stratificatio	Scent of coconut	precipitated
After 1 mount	Remedy1	0.015±5.48	White	No stratificatio	Scent of coconut	not precipitated
	Remedy2	0.032±5.76	White	No stratificatio	Scent of coconut	not precipitated
	Remedy3	0.034±5.69	White	stratificatio	Scent of coconut	precipitated
Freeze and thaw	Remedy1	0.022±5.52	White	No stratificatio	Scent of coconut	not precipitated
	Remedy2	0.018±5.76	White	No stratificatio	Scent of coconut	not precipitated
	Remedy3	0.024±5.69	White	stratificatio	Scent of coconut	precipitated



	Remedy1	0.036±5.52	White	No stratificatio	Scent of coconut	not precipitated
After 2 mount	Remedy2	0.016±5.76	White	No stratificatio	Scent of coconut	not precipitated
	Remedy3	0.053±5.69	White	stratificatio	Scent of coconut	precipitated

Evaluation of irritation

Remedy	Skin changes		implication
Remedy1	0	0	No skin changes. (Normal skin)
Remedy2	0	1	Little red skin.
Remedy3	1	2	Medium Red Skin There may be swelling at the edges. And blistering may appear.
		3	medium red skin with blistering swelling
		4	Very red skin with severe swelling. And clear water.
		5	severe allergic reaction Spread out around the test area.

CONCLUSION AND FUTURE WORK

Coconut oil extracted by cold pressing method has a yield of 12.34% Yield is clear, with coconut fragrant soft. Coconut oil is mixed with cream base, divided into 3 formulas in each formula is different in the amount of coconut oil to water. Other fixed components

Summary of physical stability and stability of coconut oil

The coconut oil in 1 formulation in various conditions was after preparation, left for 1 month, freeze and thaw, left for 2 months. The formula 1 had a pH value suitable for skin condition. At the end of the experiment, 5.41 ± 0.109, 5.48 ± 0.015, 5.52 ± 0.022, 5.52 ± 0.036, respectively, did not occur. It is more suitable for hair condition than remedy 2 and 3.

Valuation of irritation

The results of the test of irritation of the three fermented creams found that the 1 and 2 does not cause skin irritation in the volunteers. Red skin syndrome was found in formula 3 with irritant value of 1.



Assess the satisfaction of the volunteers with coconut oil.

30 volunteers aged between 20-50 years used coconut oil cream on the head hair. The satisfaction of the subjects was found to be satisfactory in the remedy 1 as follows: The softness Shine smell color of the hair was compared with the 3 formulas. The difference was no statistically significant at $p < 0.05$ but Overall of remedy 1 and 2 was statistically significant $P > 0.05$ ($p = 0.141$).

Dependent Variable	Remedy	Remedy	Mean Difference	Std. Error	Sig.
Soft hair	1	2	.70000*	.21257	.008
		3	1.50000*	.21257	.000
	2	1	-.70000*	.21257	.008
		3	.80000*	.21257	.002
	3	1	-1.50000*	.21257	.000
		2	-.80000*	.21257	.002
Shine	1	2	.80000*	.22771	.005
		3	1.70000*	.22771	.000
	2	1	-.80000*	.22771	.005
		3	.90000*	.22771	.002
	3	1	-1.70000*	.22771	.000
		2	-.90000*	.22771	.002
smell	1	2	.80000*	.20905	.002
		3	2.60000*	.20905	.000
	2	1	-.80000*	.20905	.002
		3	1.80000*	.20905	.000
	3	1	-2.60000*	.20905	.000
		2	-1.80000*	.20905	.000
color	1	2	.80000*	.26667	.017
		3	2.40000*	.26667	.000
	2	1	-.80000*	.26667	.017
		3	1.60000*	.26667	.000
	3	1	-2.40000*	.26667	.000
		2	-1.60000*	.26667	.000
Overall	1	2	.50000	.24037	.141
		3	1.90000*	.24037	.000
	2	1	-.50000	.24037	.141
		3	1.40000*	.24037	.000
	3	1	-1.90000*	.24037	.000
		2	-1.40000*	.24037	.000



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SUMMARY OF 123 CASES OF BREAST CANCER FROM PROFESSOR JIA YINGJIE’S THERAPEUTIC DRUGS

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ABSTRACT

This Study through compiling the clinical experience of Professor Jia Yingjie in treating breast cancer. Objective to summarized his various differential diagnostic and treatment methods to provide clinical reference for treating breast cancer. Method: Using retrospective analysis method, the data was collected from the patients of Professor JiaYingjie’s outpatient department at First Teaching Hospital, Tianjin University of Traditional Chinese Medicine(TCM) between January 2012 to January 2014, and receive medical treatment within 3 months or more. And has a clear histological type. Results: In 113 cases of newly diagnosed breast cancer patients’ prescriptions, For 158 kinds of Chinese herbal medicinal has been use approximately 2034 time in treatment formulation. The Chinese herbal medicinal that used for more than 50 times; the most found is Yu jin, follow in order by Chuan xiong, Jiang huang, Bai shao, Bai hua she she cao, Ban xia, Sheng di huang, Dang gui, Chai hu. And then used of Chinese Herbal Medicine that is use for more than 30 times are Tian hua fen, Tai zi shen, Mao zhao cao, Xiang fu, Sheng yi mi, Ji nei jin, Bai zhu, Mai dong, Wu wei zi, Zhi huang qi, Lian qiao, Zhi qiao, Yu zhi zi, Huang qin, which mainly treated regulate blood and relieve stasis, clear heat and relieve toxin, nourishing qi and yin, sooth liver and regulate qi, tonifying spleen and stomach.

Keywords : Breast cancer, Jia Yingjie, Clinical experience.

INTRODUCTION

This study through compiling the clinical experience of Professor Jia Yingjie in treating breast cancer. Objective to summarized his various differential diagnostic and treatment methods to provide clinical reference for treating breast cancer. Method : Using retrospective analysis method, the data was collected from the patients of Professor Jia Yingjie’s outpatient department at First Teaching Hospital, Tianjin University of Traditional Chinese Medicine(TCM) between January 2012 to January 2014, and receive medical treatment within 3 months or more. And has a clear histological type.

LITERATURE & THEORY

The incidence of breast cancer is one of the fourth highest cancers according to WHO, 2016. First in Thailand (2) most commonly cases are found in women and few can be found in men. The incidence of breast cancer has been increasing in recent years. The main treatment methods of breast cancer nowadays include surgery, radiotherapy, chemotherapy, endocrine therapy and Traditional Chinese Medicine treatment etc. For the later period breast cancer patient’s comprehensive treatment is mainly used. Traditional Chinese Medicine treatment in the clinical treatment of breast cancer or adjuvant western medicine treatment has achieved better results. It is an indispensable part of comprehensive treatment.

Breast cancer has been mentioned in Traditional Chinese Medicine, according to the etiology, pathogenesis



and clinical manifestations of breast cancer. It belongs to the category of " Breast Rock", " Breast Stone, Floral Breast " in the literature of Traditional Chinese Medicine. Treatise on the causes and manifestations of diseases in the discussion of the breast stone carbuncle pointed out that the shape of the stone carbuncle are slightly strong, not red, slightly painful together with fever. But tuberculosis is like stone, it is called stone carbuncle. Further discourses on the properties of things said “Anger-depression causing distention, day by day accumulate, spleen qi disperse the obstruction, liver Qi transverse reversal, then become hidden stone as big as flag, no pain and itchiness, decades later becomes the sore known as tuberculosis rock.” Ming Dynasty 《Waike Zhengzong· Ruyong Lun》 More expound: "Melancholy impairing to liver, thinking impairing to spleen, accumulated in the heart, would not like to be ambitious, resulting in the meridians and collaterals astringent, aggregated into mass, as big as beans, gradually like chess pieces. At that time, the five viscera are weak, and the four were not saved, they call it breast rock”. TCM believes that the occurrence of breast cancer is related to six factors such as exogenous feelings, emotional disturbance, and lost balance of Chong and Ren meridian. Because of the etiology and pathogenesis, organism misguide, different stages of disease, the clinical manifestations are often different. The treatment of breast cancer with Traditional Chinese Medicine is often based on dialectics and prescription selection.

RESULTS

1. General information results

1.1 Cases resource

From January 2012 to January 2014, 123 patients with breast cancer were treated in the department of oncology, the First Affiliated Hospital of Tianjin University of Traditional Chinese Medicine.

1.2 Age distribution (see Table 1)

Table 1 Age distribution of breast cancer patients

Age distribution	Number of case (person)	Percentage (%)
Over 56 years of age	31	25
43~55 years old	76	62
30~42 years old	15	12.2
Less than 30 years old	1	0.8

123 Cases of breast cancer patients, the oldest age was 78 years old, the youngest age was 25 years old, 40-80 years old and over 87% of patients, mainly elderly patients.

1.3 Marriage

123 Cases of breast cancer, 2 cases of marital status (missing data), 120 married, 1 unmarried.



1.4 The position of the disease

123 Cases of breast cancer, 3 cases of bilateral primary, 97 cases of right side, and 23 cases of left side. Duration of disease (Table 2)

Table 2 123 time duration of breast cancer diagnosed at outpatient service

Time	Number of case (person)	Percentage (%)
Treatment was performed within 6 months after diagnosis.	36	29.27
Treatment was performed within 7 months to 1 years after diagnosis.	56	45.53
Treatment was performed after 1 year	31	25.2

123 patients were treated with Chinese medicine in the outpatient department on average 7 months after diagnosis.

a. Pathological classification (see Table 3, table 4).

Table 3 123 pathological types of breast cancer patients (single type)

Pathological typing (single type)	Number of case (person)	Percentage (%)
Infiltrating ductal carcinoma	95	74.8
Simple carcinoma	12	9.45
Adenocarcinoma	4	3.15
Infiltrating lobular carcinoma	2	1.57
Simple adenocarcinoma	2	1.57
Mixed carcinoma	1	0.79
Intraductal carcinoma	1	0.79
Mixed carcinoma	1	0.79



Mucous adenocarcinoma	1	0.79
Invasive micro papillary carcinoma	1	0.79
Mucous carcinoma	1	0.79

Table 4 123 pathological types of breast cancer patients (double type)

Pathological typing (double type)	Number of case (person)	Percentage (%)
Invasive ductal carcinoma with mucinous carcinoma	1	0.79
Invasive ductal carcinoma and adenoid cyst adenocarcinoma	1	0.79
Lobular carcinoma and invasive ductal carcinoma	1	0.79
Infiltrating ductal carcinoma with infiltrating lobular carcinoma	1	0.79
Medullary carcinoma	2	1.57

Among 123 cases of breast cancer, 95 cases (74.8%) were invasive ductal carcinoma, 12 cases (9.45%) were simple carcinoma, mainly invasive ductal carcinoma.

b. Immunohistochemical staining of breast cancer (Table 5)

Table 5 123 Immunohistochemical staining of breast cancer in breast cancer patients

Immunohistochemical	ER(+)	PR(+)	Her-2(+)	ER (+)	PR(+)	ER(+)	triple	triple	unspecified
				PR (+)	Her-2(+)	Her-2(+)	negative	positive	
			Her-2(-)	ER(-)	PR(-)				
Number of cases	4	2	8	27	3	2	15	4	58
(person)									
Percentage (%)	3.25	1.62	6.5	21.95	2.44	1.63	12.2	3.25	47.15



123 breast cancer patients 27 (21.95%) were positive for ER and PR but 58 (47.15%) were not known by immunohistochemistry.

c. The distribution of Western medicine treatment before treatment (Table 6)

Table 6 123 cases of breast cancer patients receiving Western medicine before treatment

	Operation	Chemo-therapy	Radio-therapy	Endocrine therapy	Biotherapy	molecule-targeted treatment	Untreated medicine	Western treatment
Number of cases (person)	122	121	62	41	11	1	2	
Percentage (%)	99.19	98.37	50.41	33.33	8.94	0.81	1.63	

There were 123 patients, 2 were not treated by western medicine and 122 were treated by surgery. There were 121 patients with chemotherapy, 62 patients with radiotherapy, 41 patients with endocrine therapy, 11 patients with biotherapy and 1 patient with molecular targeted therapy.

2. Research results

2.1. The distribution of TCM Syndromes of breast cancer (see Table 7)

A retrospective analysis was made of 123 cases of breast cancer diagnosed in Professor Jia Yingjie's outpatient clinic from January 2012 to January 2014. They were treated with Traditional Chinese Medicine for 3 months or more and had definite histological types. The results of syndrome distribution were summarized as follows (Table 7).

Table 7 Distribution of syndromes differentiation in 123 cases of breast cancer

Syndromes	Number of case (person)	Percentage (%)
Toxic heat obstructing pattern	9	7.32%
Stagnation of Liver Qi	40	32.52%
Chong and Ren disorders	28	22.76%
Deficiency of Qi and blood	36	29.27%
Other types of syndromes	10	8.13%



The distribution of TCM syndromes differentiation in 123 cases of breast cancer was summarized. The highest frequency was Stagnation of Liver Qi type 40 cases (32.52%) followed by deficiency of qi and blood 36 cases (29.27%) , Chong and Ren disorders 28 cases (22.76%) and Toxic heat obstructing pattern 9 cases (7.32%) ,Other types of syndromes 10 cases (8.13%). The other syndromes were wind-heat cold, wind-cold cold and phlegm-heat obstructing lung syndrome.

2.2 Drug prescriptions and frequency of occurrence

Retrospective analysis of 123 cases of patients, excluding other 10 cases of syndrome prescriptions, 113 Chinese medicine prescriptions were analyzed (Table 8)

Table 8 113 drug prescriptions and frequency of occurrence

Frequency Distribution	Medical Name
91-100	Yu jin 10g
81-90	Chuan xiong 10-20g, Jiang huang 10g, Bai shao 15-30g
71-80	-
61-70	She she cao 15g, Ban xia 10-30g
51-60	Sheng di 15-30g, Dang gui 15g, Chai hu 6-10g
41-50	Hua fen 15g, Tai zi shen 15g, Mao zhua cao 15-30g, Xiang fu 10g, Sheng ti mi 15g
31-40	Ji nei jin 15g, Bai zhu 10-20g, Mai dong 15g, Wu wei zi 10g, Zhi huang qi 15-30g, Lian qiao 15g, Zhi qiao 10g
21-30	Yu zhi zi 15g, Huang qin 10-15g, Yuan zhi 15g, Sheng huang qi 15-30g, Shao zao ren 15g, Lai fu zi 15-30g, Ku shen 15g, Yun ling 10-20g, Ji xue teng 15g, Du zhong 15g, Da bei 10-15g, Sheng zhi zi 10 g
Frequency Distribution	Medical Name
11-20	Ju ye 10-12g, Hou po 15-30g, Fu xiao mai 30g, Shan yu rou 15g, Chuan lian zi 10g, Dan pi 15g, Niu xi 15g, Tan xiang 10g, Wu yao 10-15g, Bu gu zhi 15g, Jiao san xian 30g, Xuan fu hua 10g, Ji sheng 15g
1-10	Hu zhang 15g, Shi hu 12g, Chuan duan 15g, Mei gui hua 10g, Gan chao 6-10g, Ze xie 15g, Zhi mu 15g, Nu zhen zi 15g, Yuan hu 15g, Liu shen qu 15g, Chen pi 10g, Pei lan 10g, Sheng mu li 30g, Zhu ru 15g, Bai bu 10g, Bai zi ren 15g, Zhu ling 15g, Da huang 6g, Shu di 15g, He huan pi 15g, Dang shen 10g, Gua lou 30g, Ju hua 10g, Huang jing 15g, Ling xian 15g, Dai dai hua 10g, Ee zhu 15g, Di gu pi 15g, Shi shao 10g, Shan zi gu 15g, Huang lian 10g, Gu sui bu 15g, Guo ji zi 15g, Dan shen 15, Bai he 15g, Jiao zhi zi 10g, Zhe liu gu 15g, Ban zhi lian 15g, Ban bian lian 15g, Fo shou hua 10g, Jie geng 10g, Shan zhu yu 15g, Shou wu 15g, She qian chao 15g, Fu ling 15g, Yu zhu 15g, Jiao mai ya 30g, Chuan bei 10g, Bai ji 10g, Han lian shao 15g, Sheng jiang 15g, Hong hua 10g, Shang bai pi 15g, Dong gua zi 15g, Zi yuan 10-15g, Chang pu 15g, Sha ren 10g, Dan nan xing 15g, Qian hu 15g, Bai qian 10g, Yuan hu 15g, Shang zhi 30g, Tou gu chao 15g, Lian zi xin 10g, Gui jian yu 15g, Bai zhi 10g, Mu gua 15g, Xian he chao 15-30g, Ge gen 15g, Chong lo 15g, Xing ren 15g, Shan zha 15g, Xia gu chao 15g, Sheng long gu 15g, Tu si zi 15g, Ru xiang 10g, Jiao gu lan 15g, She xiang 15g, Yin hua 30g, Shan zha 15g, Xia ku chao 15g, Sheng long gu 10g, Chen xiang 6g, Qin jiao 15g, Su zi 10g, Chuan duan 15g, Gou ji 15g, Qian chao 15g, Qing hao 30g, Tian ma 10g, Gou teng 15g,



	Sheng shi jue ming 15g, Qian shi 15g, Er jian 10g, Ye tan 10g, Ou jie tan 10g, Zhi hua di ding 10g, Pu gong ying 15g, San qi fen 3g, Zuan shen 15g, Di long 15g, Jing jie 10g, Sheng jiang 10g, Da zao 10g, Yi zhi ren 15g, gui ye 15g, ying hua 30g, Dong hua 10g
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In 113 cases of newly diagnosed breast cancer patients’ prescriptions, For 158 kinds of Chinese herbal medicinal has been use approximately 2034 time in treatment formulation. The Chinese herbal medicinal that used for more than 50 times; the most found is Yu jin, follow in order by Chuan xiong, Jiang huang, Bai shao, Bai hua she she cao, Ban xia, Sheng di huang, Dang gui, Chai hu. And then used of Chinese Herbal Medicine that is use for more than 30 times are Tian hua fen, Tai zi shen, Mao zhao cao, Xiang fu, Sheng yi mi, Ji nei jin, Bai zhu, Mai dong, Wu wei zi, Zhi huang qi, Lian qiao, Zhi qiao, Yu zhi zi, Huang qin, which mainly treated regulate blood and relieve stasis, clear heat and relieve toxin, nourishing qi and yin, soothe liver and regulate qi, tonifying spleen and stomach.

DISCUSSION

1. Case selection

1.1 Diagnostic criteria

Diagnostic criteria for TCM Syndromes of breast cancer, Referring to the "National Administration of Traditional Chinese Medicine's 11th Five-Year Plan" and "Integrative Oncology of Chinese and Western Medicine" (Professor Jia Yingjie edited), Zhou Daihan edited for the professional use of Traditional Chinese Medicine "TCM Oncology", combined with Jia Yingjie's clinical experience, to draw up the diagnostic criteria of TCM syndromes of breast cancer.

1. Stagnation of liver Qi

Visible lump on one side of the breast and agglomerate like a stone with or without pain, hypochondriac pain or expansion through anterior breast, inhibit of menstruation, depressed and taciturn, bitter taste in the mouth and dry throat, irritability and fiery, thoracic and hypochondriac fullness, loss of appetite, Red tongue or petechia with thin yellow tongue coating or thin white coating, String pulse or slippery pulse.

2. Toxic heat obstructing pattern

Visible breast lumps rapidly swelling, dull pain, form lumps, bumps ulceration, erosion, drainage and foul smell, heat vexation or fever, dry stool and yellow urination, bitter taste and dry throat, headache and insomnia, flushed face and eye baring. Crimson tongue with yellow coating or thick and greasy coating, string rapid pulse or slippery rapid pulse.

3. Deficiency of qi and blood

Visible breast lumps without excision of the breast lumps. The lumps are adhered to the chest wall with fixed location. The lumps in the breast are ulceration with dark color with secretion of sewage. Multiple organ metastasis after radical mastectomy. Dizziness and tinnitus, restlessness, emaciation, palpitation and shortness of breathe, dull complexion, insomnia, lack of strength to speak. Pale dark or pale-enlarged tongue with thin coating, thready pulse or weak thready pulse, thready slippery pulse, weak pulse.

4. Chong and Ren disorders

Visible breast lumps without excision of the lumps, the lumps are hard, tough and adhesive to the surface and not smooth. Irregular periods, soreness and weakness of lumbar and knees, vexing heat in the five center, tidal fever, night sweats, dry mouth, dizziness, blurry vision, tinnitus. Premenstrual breast distention and pain, adhesion to the breast, the lump is hard as stone with fixed location. Red tongue with little tongue coating, thready pulse, thready rapid and weak pulse.



Confirmation of syndrome type: The first diagnosis is standard. With 3 or more symptoms, the syndrome is established.

1.2 Inclusion criteria and exclusion criteria

1.2.1 Inclusion criteria:

- A. Diagnosed as breast cancer by pathology;
- B. Chinese medicine treatment for patients over 3 months;
- C. Patients who orally or in writing agree to participate in the study.

1.2.2 Exclusion criteria:

Other malignant tumors that requires simultaneous treatment

2. Research methods and research contents

2.1 Research methods

2.1.1 A retrospective study was carried out to analyze 123 patients randomly selected from eligible patients. Professor Jia Yingjie's medication frequency was observed, and the regularity of dialectical medication was further observed and analyzed.

2.1.2 The data were collected by using Excel program to analyze data of breast cancer patients. 123 cases of breast cancer patients with general information, TCM syndrome and TCM statistics, the establishment of the corresponding database, frequency analysis.

2.1.3 Summarizes of professor Jia Yingjie's medication situation and related information for breast cancer treatment.

2.2 Research contents

2.2.1 General information: patient's name, age, nationality, occupation, possible risk factors, diagnosis time, Professor Jia Yingjie outpatient first visit time, course of disease, location of disease, pathological type, clinical stage, previous treatment of the disease in Western medicine.

2.2.2 Breast cancer patients have Chinese medicine herb frequency analysis and TCM syndrome differentiation.

CONCLUSION

Breast cancer is one of the most common malignant tumors that usually occur in breast epithelial tissues and seriously affect women's physical and mental health and even endanger their lives. Early stage of breast cancer can be asymptomatic. With the development of the disease, it may show local and systemic symptoms. The etiology of breast cancer is not yet fully understood, and some proven pathogenic factors are still controversial. Premenopausal and postmenopausal estrogens are significant factors that stimulate the development of breast cancer. Age, genetic factors, dietary factors, menarche age, external physical and chemical factors, as well as some benign breast diseases and breast tumor has something to do with it. At present, the treatment of breast cancer includes surgical treatment, radiotherapy, endocrine therapy, chemotherapy, molecular targeted therapy and Traditional Chinese Medicine treatment. Surgical treatment is still one of the main treatment methods for breast cancer. Clinically, western medicine is accepted by breast cancer patients. However, whether surgery or radiotherapy or chemotherapy, the clinical side effects are obvious. Western medicine is expensive and difficult to be accepted by patients. Traditional Chinese medicine has obvious advantages in treating breast cancer. Radiotherapy and chemotherapy can enhance the therapeutic effect, alleviate



clinical symptoms, alleviate the toxic and side effects of Western medicine, improve the quality of life, thereby prolonging the survival time. Traditional Chinese Medicine has played an irreplaceable role in the field of treatment, making up for the shortcomings of other treatment methods. Because of the complexity and diversity of clinical conditions of breast cancer, there is still no consensus among doctors on the treatment of breast cancer by Traditional Chinese Medicine. In this study, Professor Jia Yingjie summarized the law of Traditional Chinese Medicine in the treatment of breast cancer, hoping to provide a new clinical reference for further study of Traditional Chinese Medicine in the treatment of breast cancer.

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CANNABIS IN THAI MENOPAUSAL WOMAN

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ABSTRACT

Menopause is the stage of deterioration of ovarian function causing symptoms called menopausal symptoms in woman. The average age of menopause are 45-55 years with the menopausal symptoms lasting for 1-2 years. Hormone replacement therapy had been introduced the relief such symptoms. However, the researches showed the effect to the estrogen sensitive organ such as breast and uterus so the usage of hormone replacement therapy had dramatically decreasing. Many trials of phytoestrogen or other natural product were introduced to relieve the symptoms. Cannabis or Marijuana is one of that. It is illegal as addiction in many country including Thailand. On the other hand, many country realized the medical benefit of them and declare legally use in medical proposed. The relationship of estrogen and endocannabinoid system to maintain homeostasis in the body is interesting. Prohibit of cannabis in many countries cause lacking of the research. Recently, Thailand will announce the exception for medical research on cannabis. The further clinical trial for cannabis in menopause will be showed up clearer view.

Key words: cannabis, marijuana, menopause

INTRODUCTION

Ovary is the main organ for sex hormone production in female. It is controlled by the hypothalamus and pituitary, so called hypothalamo-pituitary-ovarian axis. Hypothalamus secrete gonadotropin releasing hormone (GnRH) to pituitary. Pituitary secretes many hormones including follicular stimulating hormone (FSH) and Luteinizing hormone (LH) which both regulate the cyclic ovarian function. The follicles in the ovaries will enlarge in the first half of menstrual cycle and lead to ovulation in mid cycle. Meanwhile, estrogen and progesterone are produced here. These hormones are acting for cyclic change in reproductive age woman. However, there are limited number of follicles. Ovulation may last from early teenage to about 50 years old. The average age of menopause around the world varies from early 40+ to 50+ years. In Thailand, there were reported menopausal age in Thai woman among 49-52 years.

MENOPAUSAL SYMPTOMS

Lacking of hormone in menopause caused many effects to the woman. Hot flush is the most mentioned symptom. Insomnia, sweating, mood change, bone loss, dry skin and dry vaginal causing dyspareunia or loss of sexual desire are included. Many modalities of treatment were introduced in both medical and non-medical such as hormonal replacement therapy, vitamin and mineral supplement, exercise, diet therapy, herbal and phytoestrogen product, etc. Hormonal replacement therapy was well known as the ideal medical treatment for menopause. However, following the large number of users, researches showed their adverse outcome to the estrogen receptor organ such as breast and uterus. The awareness caused changing the recommendation of treatment. What will be the next recipe?



CANNABIS

Cannabis is the name of the genus of plant originate in central Asia. It is in family Cannabaceae. There are species of cannabis. Three well known are Cannabis sativa, Cannabis indica and Cannabis ruderalis.

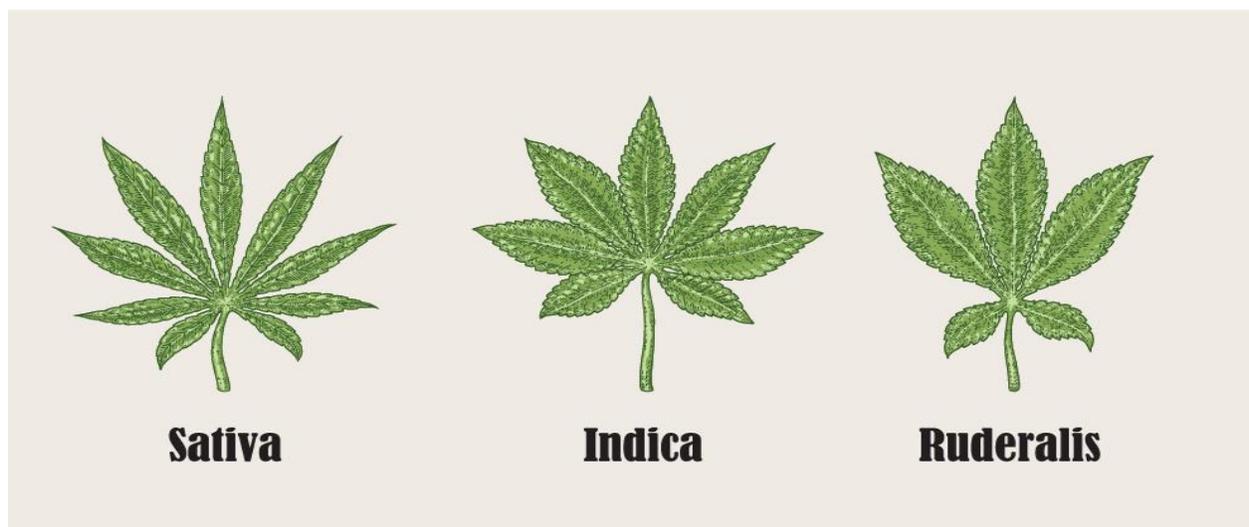


Figure 1 Three main species of cannabis

There are 560 substances contained in cannabis. The most well-known are tetrahydrocannabinol (THC) and cannabidiol (CBD). THC is the main active substance with effect to the nervous system. The concentration of THC depends on the form of cannabis. CBD is another main substance with different effect to the nervous system. It is well known in medical potential and believed as negative in psychoactive effect of THC. The potency of cannabis can vary from each species and difference preparation to another. The route of administration also has affect the intensity of cannabis's and its substance's effects. For these reasons, one person's experience of taking cannabis can be completely different from that of someone else. The processing is necessary to have exact component and controllable side effect for medical use.

CANNABIS IN MENOPAUSE

Cannabis may be one of new era options for menopause. Many study state the human endocannabinoid system is the body. It functions as maintaining homeostasis in human. The relationship of estrogen and endocannabinoid system are interesting as followed;

- It was found that cyclic change of estrogen linked to endocannabinoid and, in menopause, may link to endocannabinoid deficiency, too.
- Endocannabinoid system acts as thermoregulator and play role in menopausal hot flush. THC in cannabis has its cooling effect to the body that lowering the body temperature. It is potentially reduce hot flush, too.
- It will reduce insomnia with the psychoactive effect of THC.
- Cannabis in recreational use reduces pain and this means pain from fluctuation of hormone such as breast pain or muscle ache should be released.
- It regulate mood by reduce anxiety as in recreational use.



- Researches showed that cannabis relate to the bone formation and resorption. The continuous of bone remodeling keeps balance of the bone. Cannabis was found the positive effect to the ovariectomized mice to prevent bone lost. Further study in human is needed.
- Cannabis user related to the lower BMI compare to non-user. However the research did not state the mechanism of lowering weight.

LEGAL CANNABIS AROUND THE WORLD

Legal aspect of cannabis in the world is categorized in two parts, medical and recreational use. Each country announce their policy based of the United Nations Single Convention on Narcotic Drugs (1961), the 1971 Convention on Psychotropic Substances and the 1988 Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances. Canada and Uruguay are the only two countries allow consumption and merchandize for recreational usage. Spain and Netherland needs license to sell. Some stage in USA and South Africa allow consumption but not for sale.

There are 44 countries legally opened for medical use of cannabis, its active product or with the limitation of THC component.

LEGAL ASPECT IN THAILAND

According to Thai law about addiction, there are 5 categories of addiction, grouping base on their strength and severity of addiction. Cannabis is in the 5th category of addiction product according to the law of addiction 2522 B.E. and revised in 2545 B.E. The punishment included imprisonment, fine or both as in the table. This is the main barrier for the researcher or any kind of study related to cannabis. Laboratory research around the world showed its possible medical benefit, however, knowledge in human effect especially in Thai people is unclear.

Recently, in May 2018, Thai military government had realized the medical essential of cannabis. The government cabinet passed the agreement of using cannabis for medical use. It needs to be processed to the parliament approval prior to announce as the law. Many organizations response to this positive news. Researcher prepare the study projects in human follow the previous reports performed in animal. The Government Pharmaceutical Organization estimate the yearly production of dry cannabis in Thailand may be up to 500 tons. The following research and public usage for medical purpose will be the new era of treatment in many conditions. It will be more opened for the education center to know their medical benefit and finally lead to the usage for medical reason.

Charge	Addiction Group 5
Produce/ Import/Export	<ul style="list-style-type: none"> • Imprisonment 2-15 years and fine 200,000-1,500,000 THB
Owner	<ul style="list-style-type: none"> • Imprisonment not over 5 years or fine not over 100,000 THB or both • Over 10 kgs own will be declared as for sale
Sell or for sell	<ul style="list-style-type: none"> • Less than 10 kgs, imprisonment 2-10 years or fine 40,000-200,000 THB or both • Over 10 kgs, imprisonment 2 -15 years and fine 200,000-1,500,000 THB
Addict	<ul style="list-style-type: none"> • Imprisonment not over 1 year or fine not over 20,000 THB or both
Force other person to addict	<ul style="list-style-type: none"> • Imprisonment 1-10 years and fine 100,000-1,000,000 THB • Force by weapon of over 2 person, imprisonment 2-15 years and fine 200,000-1,500,000 THB • Force the woman or teenage, imprisonment 3 years to life long and fine 300,000 - 500,000 THB



Promote other person to addict	<ul style="list-style-type: none"> • Imprisonment not over 1 year or fine not over 20,000 THB or both
Force or trick other person to produce, import, export, sell, own for sell or own	<ul style="list-style-type: none"> • Double punishment of each item

CONCLUSION

Even though cannabis had been known as addiction, many research support it pharmacological benefit. The governor needs to realized these potential and open their mind to support clinical research in human. Aging era is coming and menopausal women are waiting for the effective and less side effect to relieve their symptoms. Hopefully, Thailand would pass this consideration and would be the one leading cannabis knowledge.

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RESEARCH FOR IMPROVEMENT OF BUREAU OF PARLIAMENTARY MEDICAL SERVICE, THE SECRETARIAT OF THE HOUSE OF REPRESENTATIVES

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ABSTRACT

Aims of this research are to improve emergency medical service system in Bureau of Parliamentary Medical Service, The Secretariat of the House of Representatives and to study general information about emergency medical service system. This research uses mixed methodologies, combining both quantitative and qualitative research. In term of quantitative section, the collected data from 22 cases of emergency patient is used to statically analyze. For qualitative section, the researcher uses the semi-structured in-depth interview with 5 samples include emergency patients, doctors, and nurses. The interview questions are test, using triangulation method, and the answer are analyzed, using content analyze.

The research's result show that 1) from 22 cases of emergency patient occurred in the secretariat of the house of representatives in 2018, 54.55% is female, 40.91% is age between 35-50 years, 27.26 % has Myocardial infarction as the emergency symptom, 40.90% of the cases occurred in 2nd building, 54.55% occurred between 9am and noon, the most common required procedure is oxygenation at 27.27%, follow by intra venous fluid and DTX at 24.24 %. Average response time is 1-2 minute and 45.46% of the case is classified as critical patient. 2) Bureau of parliamentary medical service can be easily alert in case of emergency both by internal telephone and radio system, however, the suitable communication system is not established, and the information inquiry protocol is not medically integral. The response teams are professionally qualified in on-scenes medical care and have a cleared established protocol, also, there are highly qualified team of doctor as the support. All patient is threat equally. All personal process high service mind. There is no record of complication from medical procedure occurred. Bureau of Parliamentary Medical Service's personal is regularly update new CPR techniques and has confident in using



equipment during the procedure. Bureau of parliamentary medical service also have external network which can support the team when requested, however, the bureau is still lack a routine mass casualty drill. Also, the budget in personal development, equipment, and ambulance for adequately operation capability in the new parliament building is severely insufficient. Formation of combined bureau of medical service between the house of representatives and the house of senator and integration of emergency medical service system which will result in more effectiveness in operational, academic, and managerial matter for compensation with expanding area and person in bureau’s responsibility are also require significant budget.

Keyword: research for development, emergency medical service system, Bureau of Parliamentary Medical Service, The Secretariat of the House of Representatives

INTRODUCTION

The parliament is vital for legislative body of government, such as house of representative and senate, as the place of assembly for enactment either of the constitution, acts or other law. Members of the house of representative are from general election, while, Members of the house of senate are from the voting and assignation. Majority of the member is elderly, with many underlying diseases, especially non-communicable and chonical disease which are global problem, threaten the overall health of the population and obstruct the development of the country. From WHO’s report in 2008, there are approximately 36 million people effect by non-communicable and chonical disease, 44% of them lose their life before the age of 70. Non-communicable and chonical disease is the dominant cause of medical emergency. In case of any emergency, the most important factor in survivor rate of the patient is the responded time of the team. Pre-hospital care is the step prioritized globally and given attention in its development. From many studies, the result show that 60-80% of the patient in emergency situation, pass away before arrived at the hospital. In emergency case, suitable pre-hospital procedure result in higher rate of recovery for the patient.

Bureau of Parliamentary Medical Service ‘s main mission is related to primary on-scene patient care in emergency, dispatch of ambulance and respond team. However, the service capability of the bureau has not met the current demand, due to many factors, for instance, lack of personnel, currently the bureau only has 5 personnel, 3 nurses, 1 pharmacist, and 1 rescuer, and in case the assembly occurred, there will 1 out-source respond team. Currently, there is not bureau-owned ambulance, in case of need, the ambulance has to be requested through external medical network. Medical supply is insufficient. Understanding of emergency medical service system by the concerned personnel is not at the acceptable level. The parliament’s personal is lack understanding of emergency call and first aid procedure.

From the current state, the researcher realize the importance and the benefit of study of emergency medical service system, in order to, improve the effectiveness of the service to serve a better health care for the parliament’s personnel.

LITERATURE & THEORY

1. Emergency call

Providing an easy-to-remember notification service. Easy to call Easy to transfer Easy to get the right help. This may be a recommendation only for emergency medical service units or for the delivery of transport vehicles. In each area, there should be a dispatch center able to receive notification from the public. The easy-to-remember number is 1669. The subscriber can use any telephone system.

2. Communication system Communication systems

include communication. Between emergency team patient. Medical control system the hospital should be able to deliver. In order to send patient information immediately, there are alternative channels available for backup.



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If the main channel is used, this system should cover the full operating area, whether it is in a valley in a large building or in a high-rise building.

3. Emergency medical unit

The current operating unit is divided into four levels, according to the suitability of the incident. Advanced Life Support Unit (ALS), Intermediate Life Support Unit (ILS), Basic Life support Unit (BLS) (First Response Unit (FR). The unit is operated by Communities at the district or municipal level.

4. Zoning

should be divided into areas based on the population. Size and distance and distance. response time for the distribution of operating units to reach service recipients is an average of The calculation is based on the 100,000 population per 1 unit of basic medical unit. Take into account the time it takes to reach. If it is too late, it is not good for the current service. In the urban area should be no longer than response time 10 minutes and in the outer zone. The city should not exceed 30 minutes, depending on the area restrictions.

5. Personnel and training System

Design It is important to consider the personnel that will determine who performs the duties, who should take into account the existing personnel and look to the future to find out. Better fit In Thailand, the first stage. Considered personnel involved in the system as follows. A doctor controls the system to treatment. The nurse who has the status is the same as the doctor who owns the service. System Standards and Evaluation This role is a role. B Nurse Enrichment is a high-level provider (ALS), an assistant in the medical control system, who teaches and develops staff curriculum at various levels, including the public. Is the appropriate executive unit.

6. Rules and regulations

should include rules and regulations for the performance of various levels of authority and protection of rights. This is all that is required to make this emergency medical service known as the "Emergency Medical Service System." Rules and regulations may fall under the role and responsibility of the Ministry of Public Health. But in the long run should have a statute.

7. Financial

Medical Services Emergency is a necessity for a budget. In the establishment and The budget may be viewed in two ways: the local central budget. It comes from the taxation of the country's various health insurance systems. And taxes on health-related parts. Taxes, alcohol, cigarettes, car tax, etc.

8. The people's participant

A Provide emergency medical services. It is a system designed for the community by every organizational structure. Community partners should be involved. To provide understanding. Members of the community benefit from the volunteer grouping. Apply within the community, promote knowledge, prepare. And the practice of emergency in the community itself. Representatives of the community should participate in the committee. Local emergency medical system

9. Standard and appropriate structure.

Emergency medical services in each area do not necessarily have the same shape, standard and structure, but should have the same principle or minimum benchmark. Great results. Standards should be set up in committees where agencies and organizations are participant

10. The information system

The information system of emergency medical services nationwide should have a single data system. There are minimum common variable assignments. Can be linked

11. The preparedness and classification of each hospital

should be defined by the hospital. To send sick people in various conditions. For the management. Timely and fair treatment between the hospital and the operating unit. Preventing the mistake of sending the patient to the hospital. That is not appropriate and may Cause of death Disability or medical problems



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RESULTS

From 22 cases of emergency patient occurred in the secretariat of the house of representatives in 2018, 54.55% is female, 40.91% is age between 35-50 years, 27.26 % has Myocardial infarction as the emergency symptom, 40.90% of the cases occurred in 2nd building, 54.55% occurred between 9am and noon, the most common required procedure is oxygenation at 27.27%, follow by intra venous fluid and DTX at 24.24 % .Average response time is 1-2 minute and 45.46% of the case is classified as critical patient.

Qualitative

2.1 Access to Emergency Medical Services

Fast service alert system. The easy-to-remember phone number is 1108. Advise callers. There are medical and emergency care nurses. Or coordinate the supply of ambulances to bring patients to the hospital. Can be notified by phone and internal radio communication. Or notify the personal number of the officer. Most of the staff take good care of them promptly. The location of the nursing room is within Parliament. Comfortable, easy access. The lack of pre-arrival instruction. And care in other buildings are not as thorough as the orther buildings, sometimes waiting for help for a long time.

2.2 Quality Improvement

The standard of care is universal. Treatment of symptoms and pathology. If considered beyond capacity. The patient is in a dangerous situation to provide basic care and promptly forward to the hospital as soon as possible. The protocol for the care of emergency patients. There are emergency physicians who provide care and treatment for each type of patient. Have equal service standards. All of the staff are happy with the smile. Feel the warmth, trust, treatment without complications.

2.3 The people's participant

Personnel in the Parliament are interested in self-care when sick. Focus more on health. Learn how to help others. CPR learning has the courage to use the device and help others. Do not leave or remain silent when encountering a patient. There is a parliamentary volunteer network in place to provide advice on health emergencies. There is a police officer who helps with radio broadcasts. Emergency ambulance facilities. There are rehearsal plans for the mass casualty.

2.4 mass casualty plane

Parliament is a high risk place for the protest. Or a target of terrorism Especially managing resources in a crisis situation is difficult for those without experience. Therefore, mass casualty training is essential for the Office of the Secretary of the House of Representatives. To enable personnel to become accustomed to work in a crisis, when real situations can be effectively responded.

2.5 Highlights of service

Professionalism in the care of emergency patients at the on scene. Rescuers Provide medical services to patients with severe illness. Advanced lifesaving, electric stimulation, first aid and mobility. Patients with advanced techniques. Intravenousfluid. And some drugs are under the control of doctors.

2.6 More things to adjust

Human resources development in the emergency medical system to support the new parliamentary operations. Medical equipment And parliamentary ambulance Information Use to Enhance the Effectiveness of Emergency Medicine in Management and Training, Enhancing Knowledge and Skills in Emergency Medical Systems.

2.7 What should be optimized for development?

Establishment of a joint service office between the Secretariat of the House of Representatives And the Secretariat of the Senate Integrating emergency medical services in both academic and administrative capacity. To



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provide emergency medical services covering all areas. Collaboration of multilateral network partners. Creation of personnel morale and safety in the workplace.

CONCLUSION AND FUTURE WORK

From 22 cases of emergency patient occurred in the secretariat of the house of representatives in 2018, 54.55% is female, 40.91% is age between 35-50 years, 27.26 % has Myocardial infarction as the emergency symptom, 40.90% of the cases occurred in 2nd building, 54.55% occurred between 9am and noon, the most common required procedure is oxygenation at 27.27%, follow by intra venous fluid and DTX at 24.24 %. Average response time is 1-2 minute and 45.46% of the case is classified as critical patient.

In conclusion, according to the research, from 22 cases of emergency patient occurred in the secretariat of the house of representatives in 2018, 40.91% of the patients is age between 35-50 years which is consistent with the study by Aunnop Sukphibone which the finding show that majority of patients requiring emergency medical service is age between 35- 44 years old, the working age where many of their common behaviors contribute to underlying and chronically disease , such as unhealthy life style and stress. 27.26 % of the patient has Myocardial infarction as the emergency symptom, which in Thailand is the 4th most common cause of death following heart disease. The main risk factors for the Myocardial infarction are overweight (BMI over 25) and smoking which according with the result from “research for improvement of quality of life for parliament’s personnel (2016)” which state that 54.3% of the personnel is overweight, 31.9% has hypertension and diabetes as the chronicle disease, which contributes for higher risk of stroke. 40.90% of the cases occurred in 2nd building, which can be used to theorize that due to the house of senate has a higher age average especially in special committee, also , due to having only 1 medical personnel station in the building. 54.55% of the case occurred between 9am and noon with consistent with Porntip Watcharadilok’s research which state that 32.6% of the emergency cases occurred in period from 0600- 1200 due to the stress, miss in-take of morning dose of the medicine and morning hustle.

Qualitative analyzing

1) Bureau of parliamentary medical service can be easily alert in case of emergency both by internal telephone and radio system, however, the suitable communication system is not established, and the information inquiry protocol is not medically integral.

2) The response teams are professionally qualified in on-scenes medical care and have a cleared established protocol, also, there are highly qualified team of doctor as the support. All patient is threat equally. All personal process high service mind. There is no record of complication from medical procedure occurred.

3) Bureau of Parliamentary Medical Service’s personal is regularly update new CPR techniques and has confident in using equipment during the procedure. Bureau of parliamentary medical service also have external network which can support the team when requested.

4) A routinely mass casualty drill is still not in motion.

5) the budget in personal development, equipment, and ambulance for adequately operation capability in the new parliament building is severely insufficient.

6) Formation of combined bureau of medical service between the house of representatives and the house of senator and integration of emergency medical service system which will result in more effectiveness in operational,



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academic, and managerial matter for compensation with expanding area and person in bureau’s responsibility are required and request significant budget to do so.

7) Morale and career stability building for bureau personnel is also advisable.

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UTILIZATION OF HERBAL FERMENTED WATER TO MAINTAIN THE HEALTH OF THE THAILAND COMMUNITY

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ABSTRACT

Nowadays, the well-being of people experiencing health problems. The body is not healthy, but it is difficult to recover even from hospital visits. So there are a number of people, use self-healing methods, by using herbal fermented juice to maintain health. The symptoms of illness are alleviated and cured at a later time. It also makes good health as well. This research aims to 1) to know how to use fermented water to alleviate illness and health. 2) To find ways to improve the quality of fermented juice and promote it. The results of the research showed that patients who bring water to maintain health. Symptoms of illness are alleviated, and health is obviously improved. Some people get sick as usual and can use the same life. Therefore, research on this subject is worth studying and finding ways to develop more beneficial.

Keywords: herbal fermented water, maintain, health, Thailand community.

INTRODUCTION

The problem of the living of today. The environment is polluting, unclean air and the food is full of preservatives and insecticides. Life at a hurry with scramble to eat together. The congestion of more people, cause health problems. There are a lot of people, the body is not very healthy, easy illness, and cure it becomes a chronic disease, that is difficult to treat. Even going to the doctor in the hospital for a long time. The cost of treatment is a lot, but the health of people is not good. So people or these patients with health problems are trying to find a way to heal themselves, no matter which way, only ask for good health from the disease that exists.

As mentioned above, there are many patients go to other medical services, and most popular are alternative medicine, Traditional Thai Medicine to complement the weaknesses of modern medicine cannot meet the demand. Some diseases that the current doctor does not heal. Some have just relieved the symptoms but have to take medicine all life. Some cure but the cost is very high. Other medical treatments may be cured and not much cost. Traditional Thai medicine is the national medicine. The history of treatment for patients has long been recognized by the people of Thailand. Alternative medicine it is a popular and well-known medical practice worldwide.

The World Health Organization (WHO) endorses and defines Complementary and Alternative Medicine (CAM) “The term CAM often refers to a broad set of health-care practices that are not part of a country’s own tradition and are not integrated into the dominant health-care system. Other terms sometimes used to describe these health-care practices include natural medicine, non-conventional medicine and holistic medicine.” And according to a World Health Organization survey that five of the world's most utilitarian alternatives are available Traditional Chinese medicine, Homeopathy, Chiropractic, Ayurvedic and Unani



medicine. It is Alternative medicine the first choice medicine by the World Health Organization is now. There are official certifications to take advantage of acupuncture and chiropractic. The other 3 are in progress and from the informal note. Homoeopathic therapies are in the process of being finalized and awaiting official announcement for further use.

The term "medical" means the science of diagnosis, treatment, or prevention. The aim is to relieve human suffering from suffering. It can help keep your life or return to a sick state. So any doctor can meet the needs of this patient. It is the hope and choice that is used.

Trying to maintain the patient's own health in many communities in Thailand. It is popular and satisfying for those who have health problems. The use of herbal fermented water to maintain the health by the medicinal plants that have properties in the treatment of disease. Direction the fermented water to eaten, soaked and bathed by the symptoms of each disease. When passed in no time. Health problems and illnesses are gradually disappearing. The health is perfect and can live like a man again.



Fermented water used for consumption.
(from pantip com: J8847425)



bio-fermented water
(from: videomoviles.com)



Microbial fermentation for life.

(from: saensukcity.go.th)

Fermented water (bio-fermented water) it is a liquid product. The use of sugar, sugar cane or honey is a mixture of the production process. May be called microbial water, enzyme water, probiotic fermentation, and fermented plants. Fermented water is divided into two types. 1) Fermented water for plants and animals. Use raw materials from waste or plant and animal waste. The purpose for household use and agriculture. 2) Fermented water used for consumption. Use raw materials from vegetables, fruits and herbs. Each raw material has a selection process based on nutritional properties and safety considerations.

Type 2 fermented water is the type that patients or people with health problems. Used in consumption to solve their own problems. Most of the ingredients are herbs to fermented. Because herbs are medicinal properties. The patient will choose herbs. The disease itself, such as Phlai herb treat muscular aches.

The fermentation of water to maintain health. Thai wisdom is derived from the past. Patients and relatives can do it easily. There is not much material to spend a little. To do it manually or buy from the source of cheap and self-healing. The effect on health. This is a useful overview of the country. In addition to making people healthy. It also reduces the burden on the care of patients in the hospital. Saving the public health budget. It is useful and worthwhile to study the pros and cons to educate people.

OBJECTIVE

1. To know how to use fermented water to maintain health in the community of Thailand.
2. To guide the development of fermentation quality, and to educate people in the right to use.

METHODOLOGY

1. Qualitative Research by collecting data from patients with health problems. Samples were taken from patients treated in Thai traditional medicine clinic and patients in the community of Pathumthani, Bangkok, Nakhon Pathom provinces and some provinces in the Central Region.

2. This was a qualitative research with the intent to obtain holistic, and reliable data. The researcher collected data in the community for 12 months, using the methods of in-depth interviews and participatory observation.



RESULTS

According to the research, 60 of the sample population took the fermented water to maintain their health. Some fermented water was made by themselves. Some people buy from trusted sources that cleanliness and the correct fermentation process. All fermented water use different formulas according to the nature of the disease or the health of the individual. If it is a typical health care. There are six types of herbs. Smothai, Makhampom, Noni, longan, lychee and wormwood fermented with one portion of brown sugar, 3 parts of herbs, and 5 parts of water. All mixed in plastic bucket for 8 months and then filtered out the water to the body. Fermented formula is the most popular solution to health problems. It produced by a private company that can generate sales more than 1 million baht a day. The people who buy to eat will feel the abnormality of their body before, it is better. Some people feel physically stronger than ever and sleep better. Many people do not want food, eat more. Healing people who have allergies, for example, rash, itching, coughing, coughing, and who had aching musculoskeletal fever when eating this fermented formula. The symptoms will be alleviated and cured later.

The use of the sample is a common way of saying from people who used to, mostly used. If there is fatigue diabetes, anemia, obesity, low pressure migraine. Direction: 1 tablespoon of fermented water, 1 cup of water, drink 2 times a day before meals. If external symptoms, such as skin allergy, herpes zoster, acne, blemish and inflammation, pain in the joints will bring the water to the place where it is. People who suffer from ailments along the foot will be mixed with warm water to soak the feet until it disappeared.



Pineapple fermented water lose weight very well.

(from: Narudee.com)



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Star apple: acne herbs help to brighten the skin.

(from: Cddata.cdd.go.th)



Fermentation: beauty and beauty.

(from: Goodlifeupdate.com)



Table 1. Number of patients with improved symptoms. After using the fermented water to heal.

The symptoms of the disease.	Case (n = 60)	%
Cancer	1	1.67
Migraine	3	5.00
Psoriasis	1	1.67
Diabetes	4	6.67
Anemia	1	1.67
allergy	4	6.67
Nephritis	2	3.33
Cardiac	1	1.67
Hypertension	3	5.00
Obesity	2	3.33
Sleepless	4	6.67
Cannot eat	4	6.67
Cold	5	8.33
Diarrhea	1	1.67
Fever	4	6.67
Period cramps	5	8.33
Dermatitis	1	1.67
Paralysis	1	1.67
Eye disease	2	3.33
Inflammation	2	3.33
Nourish the body	4	6.67
Herpes zoster	1	1.67
Erectile dysfunction	2	3.33
Hyperthyroidism	1	1.67
Flatulence	1	1.67
AIDS	1	1.67
Total	60	100.00

CONCLUSION AND FUTURE WORK

It is known that the treatment of traditional Thai medicine is ancient. It is herbal medicine derived from plants, animals and minerals called pharmacological objects, as a patient treatment. The drug is extracted from this pharmacy object. It popular and used today include boiling, pickling, grinding, powdering, baking, fried, boiling, refining, burning, charcoal, etc. These methods was easy to eat, in addition it is a drug that is used to treat diseases.

Another method of drug extraction used for a long time, but it appears as evidence in the Buddha, by writing in the scriptures. The monk used to make medicines by used the anchor fermented or soaked in water to eat time sick. This method is now called Bio-fermentation. The application of fermentation from ancient times and popular in some communities in some parts of the country such as in the Northeast have done much in Nakhon Ratchasima and Roi Et. In the central region there are many in Pathum Thani, Nakhon Pathom and Bangkok. So the fermentation process and the formula used vary. But most of the results are not very different.

Fermentation is a method of drug extraction. Because it takes a long time, the drug in the pharmacy objects was extracted all and have properties for the healing properties of the vegetables. The fermentation process also produces various beneficial or healthful substances, including probiotics, which are beneficial to



the intestinal microflora. It is known in the medical world. Thailand by the Food and Drug Administration (FDA) in 2008 has set guidelines and criteria for assessing the effectiveness of health and safety, and health claims of probiotics in food products. The definition of probiotics is that. “Probiotics mean living organisms, which, when the body is in sufficient quantities, will cause beneficial effects on health.” Probiotics it helps in the prevention and balance of microorganisms in the intestinal tract, digestive tract and the digestive system work better. The result is relieve diarrhea, cancer prevention, reduce lactose intolerance and reduce cholesterol levels in the blood. In addition, It control the immune response in the body, and anti-oxidation. (Free radicals) cause aging.

In addition, fermented herbs this is a substance that is extremely useful to human beings. It is Enzymes or protein molecules that catalyze biological reactions. It controls almost all biochemical processes in all organisms, from the microbes to the higher organisms. The enzyme is involved in the digestive process and the synthesis of biomolecules. This leads to the growth and repair of the wearer of the organism. Enzymes are also useful in the field of industrial applications. Benefits in the medical field. Used to produce clean energy. Dispose of toxins or heavy metals contaminated in the environment. Used in health products, for medical purposes. Enzymes can be used to treat many diseases, such as cancer, wound healing and blood clotting. Biotech derived from bio-fermentation is directly beneficial to health. When eaten, it will increase the efficiency of digestion. Helps restore the digestive system and excretory. Helps to build immunity, restore respiratory system, helps restore skin, dermatitis acne, and blemish spots. Helps bone system, muscles, body aches, enzymes help restore endocrine system, diabetes, reproductive system. Dysmenorrhea Reproductive system, blood, anemia. It also helps restore postoperative patients postpartum patients with chronic diseases. The problem is tired. Anorexia Increases energy levels for the body. Lose weight and help build immunity. Help build for people with low immunity. Make your body fit and healthy. Enzymes have many health benefits. With that said. "Enzymes will be the healing way of the future."

Extraction of medicinal plants by biological fermentation. In addition to the medicinal properties that come out with fermented water. Eat healthy and treat the symptoms. It also has probiotics and enzymes that are very beneficial for health. It can enhance the weakness of the herbs that are fermented. To be more effective in health care. It's not strange at the moment. There are many people to drink water to keep healthy. This method of drug extraction using bio-fermentation is used in the production of herbal medicines for treatment of Thai traditional medicine. It is beneficial to the country.

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SUCCESSES AND FAILURES IN RABIES ELIMINATION STORIES IN THAILAND

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ABSTRACT

Abstract— Due to many efforts in order to eliminate rabies death in Thailand from 1980 up to now. Rabies human death reduced from 370 to the lowest point at 5 cases per year in 2015. This study aimed to find a proper solution that rabies elimination can be done by reviewing epidemiological reports, patient investigation report from Department of disease control, Ministry of Public Health since 1980 to 2018. Finding that successes was not accomplished because the goal was to eliminate human rabies death to zero and there was a burst of rabies death up to 12 cases in 2018 In that year due to reduction of dog vaccination and shortage of rabies vaccines, there were



problems. The mistake of local government policy that was noted by The Office of Auditor General that Local Government cannot use their own budget to buy dog vaccine. In conclusion, this study proved that there are many rabid dogs in those provinces, and Thailand are still an epidemic country of rabies and cannot declare rabies free zone.

Keywords; Cause of epidemic, epidemiological report, rabies, success or failures

INTRODUCTION

Rational

Within 25 years, human rabies death rapidly decreased from 370 cases per year in 1980 to 7-9 cases per year in 2017, because of strong ambition and success of Rabies Eradication Program, NTV replacement with TCV)1993(, TRC Economical Intradermal Vaccination)1995 (and 5 years strategic plan .Key of success comes from the strategic planning, implementation and evaluation, strong commitment with integration of health parties i.e., many governmental departments, non-government organization, local government, politicians, mass media, health volunteers, and communities, under the evidence based on information technology, surveillance system and centralized data need to be done .Ministry of Public Health took good care and increase accessibility of the PET by universal coverage insurance system giving free of charge vaccination .With cooperation of Livestock Department, Ministry of Agriculture took care of dog population control and animal vaccination with vaccine supplied by local government . Ministry of Education increased knowledge, attitude and practice of rabies PEP in school children .The Nerve tissue vaccine)NTV (was removed from Thailand in 1993 and replaced with tissue culture vaccine)TCV .(The intradermal route of vaccination was introduced in 1994 .A strategic plan of action for control of rabies was implemented in 1996 . All these have made an impact and reduced rabies deaths .A pre-exposure vaccination campaign was conducted in the province of Phetchabun from 1998 onwards and this has completely eliminated human rabies deaths form this province for at least 20 years .From 1998 up to 2018 not a single rabies death has been reported from this province .In the country as a whole the number of rabies deaths for the past 10 years remains stable .However, the number of people exposed to dog bites has been increasing every year .This indicates that there is an urgent need to develop new strategies for dog population control. Objectives of this study reviewed a success and failure experience and data from many reports in Thailand .To find a proper solution that rabies elimination can be eliminated .Human rabies death can reach Zero and Thailand can declaim a rabies free country.

LITERATURE & THEORY

Key of success comes from the strategic planning, implementation and evaluation, strong commitment with integration of health parties i.e., many governmental departments, non-government organization, local government, politicians, mass media, health volunteers, and communities, under the evidence based on information technology, surveillance system and centralized data need to be done .Ministry of Public Health took good care and increase accessibility of the PET by universal coverage insurance system giving free of charge vaccination .With cooperation of Livestock Department, Ministry of Agriculture took care of dog population control and animal



vaccination with vaccine supplied by local government .Ministry of Education increased knowledge, attitude and practice of rabies PEP in school children .The Nerve tissue vaccine)NTV (was removed from Thailand in 1993 and replaced with tissue culture vaccine)TCV .(The intradermal route of vaccination was introduced in 1994 .A strategic plan of action for control of rabies was implemented in 1996 .All these have made an impact and reduced rabies deaths. A pre-exposure vaccination campaign was conducted in the province of Phetchabun from 1998 onwards and this has completely eliminated human rabies deaths form this province for at least 20 years .From 1998 up to 2018 not a single rabies death has been reported from this province .In the country as a whole the number of rabies deaths for the past 10 years remains stable .However, the number of people exposed to dog bites has been increasing every year .This indicates that there is an urgent need to develop new strategies for dog population control. Objectives of this study reviewed a success and failure experience and data from many reports in Thailand .To find a proper solution that rabies elimination can be eliminated .Human rabies death can reach Zero and Thailand can declaim a rabies free country.

RELATED WORKS OR DISCUSSION

Over the past 10 years mortality from rabies has decreased significantly in a number of Asian countries such as Thailand, the Philippines and Sri Lanka .The improvement is due to increased patient access to post-exposure prophylaxis and public awareness of the disease. The intradermal route has become the most frequently used route for PEP administration which safe cost and increase coverage of pre and post exposure vaccination.

Political commitment to human and dog rabies control should be done. Rabies Committees should develop long term 5- 10 years plans for human and dog rabies control. The next decade what challenge about the rabies are routine pre-exposure immunization in every child, reduced small dose vaccination such as single short vaccine for post exposure booster and reconstitute vaccine after dilution which has much role for intradermal vaccination when the remnant vaccine is too expensive to throw away. There are many publications supports.

METHODS

Research design was meta-analysis was done from source of data :

1. World Health Organization Weekly epidemiological record 2010
2. Rabies in Asia conference 2000, 2007, 2009, 2011, 2013
3. Report of a WHO interregional consultation 2002
4. Strategies for the control and Elimination of rabies in Asia 2004
5. Epidemiological reports, Department of disease control, Ministry of Public Health 1980 –2018
6. Hand Book of Rabies immunization 2000 -2016
7. Rabies publications e.g .WHO Bulletin, Journal of Vaccines, Journal of Traveler Medicines etc .



RESULTS

Recent problems of rabies in Thailand.

1. Uncontrol dog population
2. Low rate of dog's vaccination
3. Stray dog's migration and trespassing from neighbor's countries
4. Knowledge of physician and literacy of people in rabies
5. Less awareness of the fatal disease
6. High cost of cell culture vaccines for post exposure treatment
7. To many injections cause the loss of vaccination visits
8. Environment problems
9. Need for rabies immunoglobulin.
10. Shortage of vaccine.

Finding that successes was not accomplished because the goal was to eliminate human rabies death to zero and there was a burst of rabies death up to 12 cases in 2018 In that year due to reduction of dog vaccination and shortage of rabies vaccines, there were problems. The mistake of local government policy that was noted by The Office of Auditor General that Local Government cannot use their own budget to buy dog vaccine.

Dog rabies control activities are weak in most countries and do not reach the targeted coverage of 75%. Dog rabies control through immunization is the most cost effective single measure available. In addition, laboratory confirmation of all suspect rabid dogs should become an integral part of the programme. Efforts should be made to increase diagnostic facilities and trends in the incidence of dog bites should be monitored to evaluate the success of dog vaccination programmes.

Dog population management is an integral part of a dog rabies control programme. Removal of certain dogs (sick, rogue) is an important way of protecting dog and human populations in a given area. It is recommended that aggressive dogs are identified through frequent observations of community/village dog populations and removed from these populations as soon as possible. These animals should be isolated and dealt with in a humane manner.

Rabies Committees in some countries have developed long term plans for human and dog rabies control and set a date for rabies elimination. It is recommended that all countries of the region where these do not exist yet, set up their inter-sectoral rabies committee. These committees should develop a national plan with clear quantifiable objectives. The designation of a National Programme Director is an essential component of success. The Committee may take the help of WHO collaborating centres present in the region for formulating national guidelines for prevention and control of rabies and also for diagnosis and epidemiological surveys for human and animal rabies. Periodic training programmes should be arranged with the help of this WHO CC for training of medical officers and



laboratory technicians in diagnosis of rabies and proper management of post-exposure cases. In addition, public education about consequences of dog bites and their management should form an integral part of national programmes. Information (in as simple way as possible) should be provided to people through mass media such as TV, radio, newspapers, periodicals and Internet.

Cell culture rabies vaccines are made freely available to this population in all countries of the region. To reduce the cost, the use of the intradermal route should be implemented in all public hospital. RIGs should be applied around the wound 10 IU per kilo body weight to be provided in category 3 exposure.

Preventive pre-exposure immunization of school children by the intradermal route is feasible and may help offset problems of immunoglobulin shortage when a vaccinated child is exposed. Children who received two (Day 0 and 28) or three (Days 0, 7 and 28) single doses of 0.1ml PCEC rabies vaccine, administered intradermally into the deltoid region giving the same result. Using 0.1cc. ID one shot at 3 visits at day 0, 3, 7 are adequate for stimulation of lifelong immunity and require 0.1 CC ID single shot for booster when they are bitten.

In addition, it is also suggested that each country in the region should assess specific problems peculiar to that country and work out strategies to overcome the same. The countries can take the help of WHO in formulating such strategies.

CONCLUSION AND FUTURE WORK

Over the past 10 years mortality from rabies has decreased significantly in a number of Asian countries such as Thailand, the Philippines and Sri Lanka. The improvement is due to increased patient access to post-exposure prophylaxis and public awareness of the disease. The intradermal route has become the most frequently used route for PEP administration which safe cost and increase coverage of pre and post exposure vaccination.

Political commitment to human and dog rabies control should be done. Rabies Committees should develop long term 5- 10 years plans for human and dog rabies control. The next decade what challenge about the rabies are routine pre-exposure immunization in every child, reduced small dose vaccination such as single short vaccine for post exposure booster and reconstitute vaccine after dilution which has much role for intradermal vaccination when the remnant vaccine is too expensive to throw away. There are many publications supports.

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Effectiveness of Self-Help Group to Decrease Stress in Mental Health Promotion Behaviors of Elderly in the Fourth Village, Bangnanglee Sub-district, Amphawa District, Samut Songkhram Province

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ABSTRACT

This research was quasi experiment and study. The purposes of the study of effectiveness of self-help group to decrease stress in mental health promotion behaviors of elderly in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province were: 1) To study the effectiveness of self-help group in decreasing stress in mental health promotion behaviors of elderly in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province, 2) to compare mental health promotion behaviors on knowledge and practice between pretest and posttest of self-help group of elderly in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province, and 3) to study the level of stress in elderly who participating in self-help group in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province. For the research sample, 50 specific samples were selected from 100 persons to participate in self-help group involving mental health promotion behaviors to stress of elderly. The data were collected by using questionnaires dealing with knowledge, self-efficacy, mental health and attitude of elderly. The data were analyzed by employing percentage arithmetic mean, standard deviation and paired t-test.

The result: After the experimental

1. It was found that the mental health after self-help groups on decreasing stress was improved.
2. Mental health promotion behaviors on knowledge of self-help group of elderly between pretest and posttest had a significant difference of 0.05.
3. The self-efficacy group of the elderly had significantly different level at 0.05, which indicated that after receiving the self-help group, the overall scores was higher.

Conclusion: That was effective to use self-help group in decreasing stress in mental health promotion behaviors of elderly in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province.

Keywords: *Effectiveness of Self-Help Group, Mental Health Promotion Behaviors, Stress, Elderly*

INTRODUCTION

Chronic health problems in the elderly frequently occur, but they can be prevented or, if such diseases are present, can be adapted to their own disease. They can be able to live like normal people and not be harmed by complications. Pender (1996) states that health promotion behaviors can be either individual or group activities which improve well-being. Normally, elderly always seek for health information to practice. Therefore, the elderly will have a better mental condition if they have been encouraged or supported on health promotion by family, community or public health officers. According to health promotion, it comprises of 6 aspects which are: 1) Health responsibility—the behaviors that people pay attention to their own health by studying their own health knowledge, meeting health professionals, following their recommendations, and finding or interested in potential abnormalities. The elderly can be made by seeking health literacy through reading or media, observing the changes and dysfunctions, and



checking up physical conditions at least 1-2 times a year. They can also talk or communicate with healthcare a specialist, join a club, association, or participate in a health program. Therefore, the elderly are aware of useful health information and can practice to promote good health as well as prevent potential harm; 2) Interpersonal relations—the behaviors that people interact with each other, and have a good sense of well-being between people, accepting other people's behavior and helping each other which affects their behavior, and changes to the way they want; 3) Physical activity; 4) Nutrition; 5) Stress management—the behavior that represents a person's stress management, such as proper expression, relaxation, sleep, relaxing activities, or exercise to prevent fatigue; 6) Spiritual growth—the activity that individual performs in expressing his/her awareness of the importance of life, determining the purpose or planning of the life. It is an activity that the people perform in express themselves about the realization of the importance of life. If the elderly are able to perform all six health promotion activities, they will be healthy and happy. Robbins (1996) states that employees who face stress can express themselves in variety ways, such as high blood pressure, heart disease, metabolic change, anger, easy temper tantrums, mouth ulcers, poorer decision performance, and so on. These symptoms can be explained in three ways including physical, psychological, and behavioral symptoms.

Therefore, the researchers is interested in study the effective of self-help group to stress with mental health promotion behaviors of elderly in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province. This research expects to discover the mental health promotion behaviors to decrease stress in the elderly, in terms of knowledge and practice, before and after participating in self-help group. Moreover, the research also attempts to find out the effective of the self-help group and the mental health promotion behaviors affecting the stress of the elderly. This will benefit the agencies involved in providing services to protect and promote mental health of the elderly appropriately.

Objective of the study

1. To study the effectiveness of self-help groups to stress with mental health promotion behaviors of elderly in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province.
2. To compare the mental health promotion behaviors in decreasing stress of the elderly, in terms of knowledge and practice, before and after participating in self-help group in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province.
3. To study the level of stress in elderly who participating in self-help group in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province.

INSTRUMENT AND METHOD

Instrument

Part 1: The demographic questionnaire

Part 2: The questionnaire about the elderly's knowledge on mental health promotion behaviors and stress. The questionnaire was developed by the researcher according to the manipulation of definition and the literature review. The questionnaire consisted of 6 items.

Part 3: The questionnaire about the elderly practice. The questionnaire was developed by the researcher according to the manipulation of definition and the literature review. The questionnaire consisted of 5 items.

Part 4: Suan-Pueng stress questionnaire in order to measure the stress of the elderly. The questionnaire was developed by the researcher from the program to prepare the program in the mental health survey in the year 2002. The questionnaire consisted of 20 items.



Scoring and Interpretation

Questionnaires about knowledge in psycho-education to enhance self-efficacy and quality of life for seniors, and mental health – the 5-point rating scale are adopted. The results of the stress evaluation of the score of 63 and above translated into severe stress. The score was 43 – 62 translated into high stress. The score was 25– 42 translated into moderate stress and scored 0 – 24 translated into less stress.

Methodology

The population in this study was elderly aged 60 or upper years old who able to provide information, and cover the variables studied. The samples were 100 participants in Amphawa, Samut Songkham.

Samples

The samples in this study were elderly aged 60 or upper years old who able to provide information, and cover the variables studied. The samples were 100 people in Amphawa, Samut Songkham. Then, 50 participants were randomly selected into experimental group, including 13 males, and 37 females. The experiment group was participated the self-help group to stress with mental health promotion behaviors of the elderly in Bang Nang Li,

Amphawa, Samut Songkham province, therefore, compare the results before and after participation. In addition, the criteria to select samples were as follows: 1) participants must be 60 years of age or upper; 2) they must be willing and please to join the group; 3) they can answer the questionnaire; and 4) they can participate in the self-help group.

Table 1: Mean and standard deviation after participating in self-help group to stress (50 persons)

category	\bar{x}	S.D.	Level
Knowledge of mental health care.	3.52	0.20	High
Practice in dealing with stress.	3.26	0.31	Moderate
Stress after experienced self-help group	3.39	0.21	Moderate

Table 1 illustrated that the knowledge scores on self-care mental health and the performance of the elderly in stress management after self-help group to stress were moderate ($\bar{x} = 3.39$, $SD = 0.21$). The results showed that the elderly had high levels of self-care ($\bar{x} 3.52$, $SD = 0.20$) and moderate level of stress management ($\bar{x} 3.26$, $SD = 0.31$).

Table 2: Comparison the scores between before and after participating in the self-help group to stress

category	\bar{x}	S.D.	Level
Knowledge of mental health care.	3.52	0.20	High
Practice in dealing with stress.	3.26	0.31	Moderate
Stress after experienced self-help group	3.39	0.21	Moderate

* Significant level at 0.05

The average of overview before participating self-help group to stress of the elderly was 3.03, $SD = 0.66$, and overview after self-help group to stress were 3.39, $SD = 0.21$. The average of overview before and after participating self-help group to stress of the elderly was significantly different level at 0.05 which means after participating self-help group to stress, they were better.



CONCLUSION AND DISCUSSION

Conclusion

The results showed as follows:

General data showed that the participant were 37 females (or 74 percent), and 13 males (or 26 percent). Majority of them were age between 61-65 years, 22 participants (or 44 percent), followed by age between 66-70 years, 12 participants (or 24 percent), age between 76-80 years, 9 participants (or 18 percent), age between 71-75 years, 5 participants (or 10 percent), and age 81 years or upper, 2 participants (or 1 percent), respectively. In respect of marital status, most of them were married. 29 of participants, or 58 percent, reported that their spouses still alive and living together, 15 of participants, or 30 percent, reported that their spouses pass away. There were 6 participants, or 12 percent, reported that they are single. Most of them, 18 participants (or 36 percent) had a regular work income, followed by 17 participants (or 34 percent) received income from descendants, 11 participants (or 22 percent) received income from government support, and 4 participants (or 8 percent) received income from temporary work, respectively. The majority of them, 35 participants (or 70 percent), were joint saving club, followed by 14 participants (or 28 percent) join the exercise club, and other for 1 person (or 2 percent). The results were as followed:

The knowledge of mental health care and self-efficacy scores of the elderly in stress management after self-help group to stress were moderate ($\bar{x} = 3.39$, $SD = 0.21$). The results showed that the elderly have knowledge of mental health care at high level ($\bar{x} = 3.52$, $SD = 0.20$) and moderate level of stress management ($\bar{x} = 3.26$, $SD = 0.31$).

1. The knowledge of mental health after self-help group was in high level ($\bar{x} = 3.52$, $SD = 0.20$). When considering in each item, there was a highest agreeable on “You participate in activities with neighbors, such as attend the wedding, giving merit to monks” ($\bar{x} = 4.98$, $SD = 0.14$), followed by “You participate in family activities, such as visiting relatives, to vacation” ($\bar{x} = 4.86$, $SD = 0.35$), and the least agreeable was “You do not talk to your neighbors when you got stress” ($\bar{x} = 1.06$, $SD = 0.31$). Additionally, the average of knowledge of self-care mental health before self-help group was (3.12, $SD = 0.67$), and the average go to (3.52, $SD = 0.20$), after self-help group. The average score on knowledge of self-care mental health before and after the self-help group to stress of the elderly was significant level at 0.05, which indicated that the mental health after self-help groups to stress was improved.

2. The practice in dealing with stress after self-help group to stress was at a moderate level ($\bar{x} = 3.26$, $SD = 0.31$). When considering in each item, the most agreeable was “You are prepared for life which may change in life, such as the death of loved ones, live alone” ($\bar{x} = 4.82$, $SD = 0.39$), followed by “When you feel stressed or cannot solve the problem, you have to consult a psychiatrist, a psychiatric nurse or a psychologist” ($\bar{x} = 4.62$, $SD = 0.70$), and the least agreeable was “You think that each problem is not solved, leave it to the fate” ($\bar{x} = 1.18$, $SD = 0.52$). The average of elderly behavior in stress management was (2.93, $SD = 0.95$), and after self-help group to stress was 3.26, $SD = 0.31$. As the results, the self-efficacy group of the elderly was significantly different level at 0.05, which indicated that after receiving the self-help group, the overall scores was higher.

3. The results from Suan-Pueng stress questionnaire showed that, there was the low level of stress of elderly ($\bar{x} = 1.71$, $SD = 0.91$). When considering in each item, the least stress score was “hard to concentration” ($\bar{x} = 1.36$, $SD = 1.05$), followed by “worry about toxins or air pollution” ($\bar{x} = 1.48$, $SD = 1.05$). Moreover, the most common causes of stress were financial problem, economics, and the housework ($\bar{x} = 2.02$, $SD = 1.56$).

4. Overall, the average before self-help group to stress was 3.03, $SD = 0.66$, and after self-help group to stress was 3.39, $SD = 0.21$. As the results, the self-efficacy group of the elderly was significantly different level at 0.05, which indicated that after receive the self-help group, the overall scores was higher.



Discussion

The results from the study of self-help group to decrease stress in mental health promotion behaviors of elderly in the fourth village, Bangnanglee sub-district, Amphawa district, Samut Songkhram province illustrated that knowledge of self-care mental health after self-help group on stress was at a high level ($\bar{x} = 3.52$, $SD = 0.20$). When considering in each item, there was a highest agreeable on “You participate in activities with neighbors, such as attend the wedding, giving merit to monks” ($\bar{x} = 4.98$, $SD = 0.14$) which consistent with the research of Talordpop, Pratumtone, Rueankorn and Mhopuang (2009) that the highest agreeable was on giving merit to monks, followed by participating in family activities, such as visiting relatives, attend the religious activities, practice meditate, and so on (Jutha, Luemjan, & Chantarachote, 2012), on vacation ($\bar{x} = 4.86$, $SD = 0.35$), and the least agreeable was “You do not talk to your neighbors when you got stress” ($\bar{x} = 1.06$, $SD = 0.31$) respectively. In addition, the practice in dealing with stress after self-help group on stress was at a moderate level ($\bar{x} = 3.26$, $SD = 0.31$). When considering in each item, the most agreeable was “You are prepared for life which may change in life, such as the death of loved ones, live alone” ($\bar{x} = 4.82$, $SD = 0.39$) which was consistent with the research of Talordpop and others (2009) found that elderly had stress when their spouse died. In some case, elderly had to live alone because their children are separated from their families or have to go to work. As the result, the environment and society were not conducive to the life of the elderly, lack of contact, suffering from various forms of oppression, which affected the physical and mental health deteriorate, and then, stress occurred. The elderly who could deal with stress problems were “When you feel stressed or cannot solve the problem, you have to consult a psychiatrist, a psychiatric nurse or a psychologist” ($\bar{x} = 4.62$, $SD = 0.70$). Conversely, the elderly who could not deal with stress was “You think that each problem is not solved, leave it to the fate” ($\bar{x} = 1.18$, $SD = 0.52$). The results from Suan-Pueng stress questionnaire showed that, there was the low level of stress on elderly ($\bar{x} = 1.71$, $SD = 0.91$). When considering in each item, the least stress score was “hard to concentration” ($\bar{x} = 1.36$, $SD = 1.05$), followed by “worry about toxins or air pollution” ($\bar{x} = 1.48$, $SD = 1.05$). Elderly mentioned that they dealt with stress by relaxing by watching TV, watching movies, listening to music, singing a song or playing music. The highest stress score was the family conflict on finance which may come from some elderly had to support their families, children, daily living expenses, and spending on the health, which was consistent with the research of Chiakulwattana, Mulsarn and Rattanadaj (2005) that the most common causes of stress were financial problem, economics, and the housework ($\bar{x} = 2.02$, $SD = 1.56$). It was also consistent with Kanitha Talordpob and others (2009) that the stress from financial factors in terms of expenditure increased, not enough money, and income decreased. If the elderly could not deal with stress problems, it will affect health. Pender's health promotion concept (Sithisar, & Suannoom, 2007) stated that one of six aspects of self-health promotion was stress management. It mentioned that if the elderly manage the stress, such as proper expression, relaxation, sleep, relieve stressful activities, or prevent fatigue activities, they will be healthy and happiness. Many elderly did not concern with managing stress, or misunderstood on about how to reduce stress. If the stress came from economic problem, they should know how to save and make the simple life, and encourage to do part time job to earn more money.

Overall, the self-efficacy group of the elderly had a significantly different level at 0.05. The results indicated that after receive the self-help group, the overall scores was higher which show the effectiveness of self-help groups to stress with mental health promotion behaviors of elderly in the fourth village, Bangnanglee sub-district, Amphawa district, Samutsongkhram province.



SUGGESTIONS

General Suggestions

1. In the nursing education, nursing instructors should adopt a mental health promotion approach in their knowledge and practice in the prevention of stress on the elderly. Moreover, they should take the lead in mental health knowledge, and increase their potential in mental health promotion to provide the elderly with mental health promotion behaviors, knowledge, and practice in preventing stress appropriately.
2. In the nursing practical, nurses can apply the concepts of mental health promotion, knowledge, and practice in the prevention of stress of elderly to the other ages in order to prevent mental health problems, and improve the quality of life for the elderly who stay home.
3. In research, the researcher may introduce the concept of health promotion to develop mental health promotion behaviors, in terms of knowledge and practice, in order to prevent the public stress in other fields and improve the quality of life in all aspects of the people.

Suggestions for Future Research

1. The study should be conducted to monitor the behavior of mental health promotion, in terms of knowledge and practice in elderly stress prevention in the long run, in order to assess the persistence of behavior.
2. Apply the mental health promotion approach to knowledge and practice in the prevention of stress of the elderly to adjust to experiment with other ages or to promote other health.

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Opinions of Undergraduate Nursing Students on Their Community Health Nursing Experiences: School Placements

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ABSTRACT

This descriptive study aimed to explore the opinions of undergraduate nursing students on their experiences in school placement. This practicum focused on the primary schools, located in the Bangkok Administration Metropolitan, organized under Ministry of Education. One hundred and six of the 4th year nursing students studying during the 2017 academic year at the College of Nursing and Health of Suan Sunandha Rajabhat University were employed for participation using the purposive sampling technique. The research instruments consisted of three parts: 1) personal information, 2) respondents' opinions of their community nursing practicum experiences, a part of the school health setting, and 3) open-ended questions on the school health nursing practicum. Data were analyzed using percentages, means, and standard deviations. Most respondents were women (86.8 %), with a range age of 20-23 years and grade point average (GPA) of 3.06 ± 0.29 . This study indicated the positive agree of the opinion toward nursing skills practice in the school placements likewise the assumption. The results of this study reveal undergraduate nursing students' opinions on the community health nursing practicum a part of school health. After students completed their clinical practice, the practicum was undertaken in the school's curricular requirements. Further studies should compare these results with those from clinical placements in the greater areas of Bangkok.

Keywords: *Nursing Students, School Nurses, Skills Experiences, School Placements*

INTRODUCTION

It is important for educational programs to identify students' perceptions of different areas of healthcare during their studies (an Iersel, Latour, de Vos, Kirschner, & op Reimer, 2018). All the 4th year of nursing students are introduced to the notion of communities as clients in community health nursing courses, a part of school placements which emphasize the role of the nurse as a form of ensuring quality of nursing education. These clinical courses allow all senior nursing students to gain experience in organizing care, managing time, using nursing processes, and learning through clinical placements in the primary schools, like all health programs in the community (Andrews & Roberts, 2003; Leroy, Wallin, & Lee, 2017). Also, school health nursing is specialized practice of the final year nursing students that advance practice, academic success, and life-long achievement of students. Therefore, learning to be as school nurses, they learn for assessment of health complaints, medication administration, and care for students with special health care needs, mandated health screening programs, verification of immunizations, and infectious disease reporting, identification and management of students' chronic health care needs that affect educational achievement (Magalnick & Mazyck, 2008). Meanwhile, related factors also affect the background experiences in these contexts, such as variety of



clinical placements, healthcare staff, and supervisors (Kanchana Kiatkanon, et al., 2018; Löfmark, Thorkildsen, Råholm, & Natvig, 2012). Moreover, a community health nursing practicum is often seen as a challenging environment, as it requires students to be creative and innovative in problem solving and relationship building, after having practiced working on a ward to school their clinical nursing skills (Itatani, Nagata, Yanagihara, & Tabuchi, 2017). The senior nursing students of the College of Nursing and Health (CNH) at Suan Sunandha Rajabhat University (SSRU) are enrolled in the final year academic course in community health nursing, a practicum that integrates all of the students’ experiences in surgical, medical, pediatric psychiatric, and obstetric nursing skills (College of Nursing and Health, 2005).

The main duties for the community health nursing experience practicum consist of four assignments: 1) Community health diagnosis, which focusing on community assessments, priority setting, a health planning project to develop the community, implementation, and evaluation; 2) Home visits for those whose health is at risk, and/or home health care in the community for disabled people; 3) Health education, which is an integral part of the nurse’s role in the community and which requires them to respond effectively to health care demands for promoting health, preventing disease, and maintaining wellness; and 4) School health nursing, where in the college students focus on the prevention of disease and the promotion of children’s health in school settings (Pongpirul, Starfield, Srivanichakorn, & Pannarunothai, 2009). In addition, nursing students use nursing processes and functions in communities where they provide primary health care and serve as educators, nurse leaders, advocacy, as well as school nurses (College of Nursing and Health, 2017).

In Thailand, the school nurse plays a central role collaboration with many other individuals is important, the coordinated school health program includes multiple components which are school health services, health education, health promotion, counseling, nutrition services, physical education programs, healthy school environment, and family with community involvement. These roles of making students health diagnoses and monitors, as researchers, to explore the opinions of nursing students regarding the community health nursing practicum:- school placements, after they have completed the community health nursing skills portion of their training. Clarifying their expected experiences and the opinions of their special placements is an efficient way of creating a more effective clinical field (Allender, Rector, & Warner, 2017).

OBJECTIVE

This study aimed to explore the opinions of undergraduate nursing students related to their experiences, a part of school health nursing practicum. It included working as a nurse for health education, health promotion, and healthy school environment in the primary schools under supervised by Ministry of Education, located in the Bangkok Metropolitan Administration (BMA), Thailand.

METHODOLOGY

Design and participants—a descriptive study methodology was applied. All participants were recruited via the purposive sampling technique from a pool of 482 nursing students at the College of Nursing and Health, Suan Sunandha Rajabhat University. The 106 senior nursing students who participated in the study were in their fourth academic year during the second semester of 2017 and enrolled the Community Health Nursing Practicum. All practicing were completed at Public Health Centers 6, 17, 19, 25, and 38, which are run by the BMA Office of Health together with College of Nursing and Health. Suan Sunandha Rajabhat University, Thailand.



Research instrument—academic lecturers from the College of Nursing and Health developed the questionnaire, which was based on the requirements of the community nursing skills practicum (College of Nursing and Health, 2017). The content validity and reliability were tested (Cronbach’s alpha = 0.94). The measurement instrument consisted of three parts. The first part gathered general characteristics information. The second part contained 10 items related to the students’ opinions of issues associated with their experiences during the community nursing practicum, focusing on a school placement for practicing nursing skills. These addressed in the government primary schools in only urban area of BMA. Students were asked to rate each item about their experiences at school placements, using a 5-point rating scale, ranging from 5 (“strongly agree”) to 1 (“strongly disagree”). The researchers divided the data into two activities. Focused on 1) the experiences during the practicum in a procedure of school priority setting (the maximum possible score was 30, and the minimum possible score was 5) and 2) the activity of health survey by physical examination, with a maximum possible score of 20 and a minimum possible score of 4. Students’ opinions were rearranged for one of three levels: low, intermediate, or high, based on average and standard deviation. The second part was presented in the overall scores of students’ opinions during placing in school placements after completing all procedural assignments in the field. The third part was an open-ended question, which allowed students to add comments about their nursing experiences in those setting.

Ethics approval and recruitment—after obtaining Ethics Committee approval from Suan Sunandha Rajabhat University (COA.1-020/2018), the team of researchers informed participants via classroom announcements and a mobile application as a means of inviting them to engage in the study. All participants completed a consent form before beginning the questionnaire. All questionnaires were marked and collected during the allocated classroom timetable. Finally, the questionnaires were returned at a response rate of 100% (n = 106). The data collection was completed in March 2018.

Data Analysis—frequencies, percentages, means, standard deviations, and maximal and minimal values were used to summarize general characteristics. This was in addition to the 10 items that asked the students’ opinions.

RESULTS

The number of participants was 106. Their general characteristics were: women (86.8 %), mean age of 21.4 ± 0.3 years, and GPA average of 3.06 ± 0.29. Most of the results for each item related to students’ opinions showed similar views after students had completed the Community Health Nursing Practicum course, as shown in Table 1.

Table 1.
Opinions of nursing students after completing the School placement for Nursing Skills (n=106)

Item	Strongly disagree	Agree	Neutral	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
1. I learned how to approach the school directors/school leaders/ director of Public health center / School educators/ all health care staff.	34 (32.1)	56 (52.8)	15 (14.2)	1 (0.9)	0 (0.0)



Item	Strongly disagree	Agree	Neutral	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
2. I learned how to complete students’ physical examination	58 (54.7)	40 (37.7)	7 (6.6)	1 (0.9)	0 (0.0)
3. I learned how to measure visual acuity with screen vision problems	48 (45.3)	45 (42.5)	13 (12.3)	0 (0.0)	0 (0.0)
4. I learned how to screen students’ health problems	46 (43.4)	53 (50.0)	7 (6.6)	0 (0.0)	0 (0.0)
5. I learned how to survey the sanitation& environmental problems in school.	39 (36.8)	53 (50.0)	14 (13.2)	0 (0.0)	0 (0.0)
6. I learned how to select students’ health problems for the priority setting	54 (50.9)	43 (40.6)	8 (7.5)	1 (0.9)	0 (0.0)
7. I learned how to express the major health problems and write the web of causation	47 (44.3)	52 (49.1)	6 (5.7)	2 (0.9)	0 (0.0)
8. I learned how to operate the health promotion project with a healthcare team, and to serve students in school.	45 (42.5)	52 (49.1)	8 (7.5)	1 (0.9)	0 (0.0)
9. I learned how to evaluate the project as follow the nursing process	46 (43.4)	53 (50.0)	6 (5.7)	1 (0.9)	0 (0.0)
10. I learned how to encourage students to participate the project for promote their health	50 (47.2)	49 (46.2)	6 (5.7)	1 (0.9)	0 (0.0)

In Table 2, we divided the sub-scores in terms of the experiences in a school placement which was the activity of health survey by physical examination and the operation for health promotion project.

The result findings showed an intermediate to high score for participants’ opinion, a part of the activity of health survey by physical examination sub-score was 4.33 ± 0.56 (4 items, max 5, min 3), a procedure for school priority setting for health promotion project was 4.35 ± 0.55 (6 items, max 5, min 3), and The overall score for the school placement was 4.34 ± 0.54 (10 items, max 5, min 3).



Table 2.
Levels of opinion scores related to the nursing skills in school placement (n=106)

Category Scores	n	(%)
The activity of health survey by physical examination (4 items): high level score $\bar{X} = 4.33$ S.D = 0.56 Max = 5 Min = 3	94	88.7
A procedure of school priority setting & health promotion project (6 items):high level score $\bar{X} = 4.35$ S.D = 0.55 Max = 5 Min = 3	99	93.4
The overall score for school placement (10 items): high level score $\bar{X} = 4.34$ S.D = 0.54 Max = 5 Min = 3	100	94.3

As Table 3 shows, a part of the open-ended section presented to nursing students who practiced in the school placements asked them about demonstrating their nursing skills; learning how to manage nursing skills, both in group and individual assignments; and building their self-confidence while working independently with students and with colleagues as a part of a school-healthcare team.

Table 3.
Students’ experiences during a community health nursing practicum: School placements

Area of practice	Examples of nursing skills & experiences
The activity of health survey by physical examination under organized by the BMA Public Health Centers: Public Health Center 6 Public Health Center 17 Public Health Center 19 Public Health Center 25 Public Health Center 38	It is important to consider complex care needs in children. I felt a low level of self-confidence as practicing in the school because I lack primary medical care nursing skills for providing individual health services, especially in teenagers. This is my the best opportunity to present “the role of school nurse” I found a big problem in a little kid in case of caries, and poor oral hygiene care. It is not easy to diagnose by myself without intensive practicing
Preparing a procedure for health promoting project	I feel so lucky that my teammates helping each other as unexpected things happen. So that I’m sure I meet a good friends & teamwork. I explored how to approach director of school who manage education program. I am so excited to approach the school director for our presenting the health promotion project before setting the project to intervene in the school. I think “school nurse role” is a big job to coordinate various activities of the school health services team with the child’s primary care
Open their mind for their future work	If I complete my study to be the new GN, I may apply to be a school nurse. I don’t like a school placement so much that I observe the staff (school nurse), she looks so busy all time because she is only one nurse to have school-workload with more than 4 schools.



CONCLUSION AND FUTURE WORK

Discussion—one hundred six nursing students, enrolled in the community health nursing practicum during academic year of 2017, were purposively selected for inclusion in the study and expressed plans to be involved in school assignments. Our findings showed their overall opinion scores toward this subject, which were high. Also, the sub-scores for children’s health survey by physical examination and preparing for health promoting project were high. We concluded that this part of nursing skills in a school placement required the students to show initiative, to be creative when faced with new situations in the community, and to confront global challenges to their own views and experiences; these expectations are consistent with previous studies (Van Iersel, et al., 2018; Moely, McFarland, Miron, Mercer, & Ilustre, 2002; Thongcharoen, Santanavanich, Tiewwanich, Khumtaveeporn, Somboontanont, Wayuhued, Krongthammachart, Lekdamrongkul, & Suvarnarong, 2013; Suapumee, Naksrisang, & Singhasem, 2017). By contrast, we found evidence that their opinions were related to the characteristics of different placements, the situations of the health problems they encountered, and the healthcare staff and academic supervisors with whom participants worked (Kanchana Kiatkanon, et al., 2018; Pijl-Zieber, Barton, Awosoga, & Konkin, 2015; Aungwattana, Jongrungratsakul, & Sripetchwandee, 2015).

Conclusion and recommendation—the results of this study demonstrate that undergraduate nursing students agree with the learning experiences after completing their clinical practice in the government-primary schools, as required by their curriculum. However, further studies should be conducted to compare students’ perceptions of different placements in the greater areas of Bangkok.

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Health Promotion and Perception of the Knowledge and Health Promotion Behaviors of the Pregnant Women at Antenatal Clinic at Phranannklao Hospital

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ABSTRACT

The purpose of this quasi-experimental research was to examine the effects of a health promotion program on exercise behavior at antepartum mothers. Pender's Health Promotion Model (1996), Connectionism Theory of Thorndike (cited in Bernard, 1972), the home care were utilized for the conceptual framework. Subjects consisted of 40 antetrapartum mothers, 20 were assigned to a do not receive health promotion and 20 were assigned to an experimental group. Subjects were selected by age, education level, income, and gravidity. The group received routine nursing care and the experimental group received the health promotion program. Nutrients, Exercise behavior, self-care, breastfeeding and abnormal signs in pregnancy were assessed using a modified version of the questionnaires developed by Siriwan Tumcheaw (2002). The instruments were tested for their internal consistency using Cronbach's alpha. They both demonstrated acceptable reliability at .711 and .812 respectively. Data were analyzed using correlation statistics and paired t-test.

Major findings were: the mean score of exercise behavior of antenatal mothers in receiving the health promotion program the score was higher than the other group.

Keywords: *Health Promotion Behavior, Behavior, Perception of Knowledge, Pregnant Women*

INTRODUCTION

During the pregnancy, there are changes in physical and mental health that affect the infant and the mother. We should promote health to the pregnant women to perceive the knowledge and behavioral health in order to maintain the health status of pregnant women. The research studies about the benefit of health promotion during pregnancy. The relationship between the person's age and education level as well as health behavior promotion in enhancing nursing care plan, helping and adjusting the behavior of pregnancy women and detecting the abnormal signs during pregnancy maintain the high quality of population.

The ministry of public Health set the target of the body weight which should not be less than 2,500 grams but not more than 7%. The death rate in infants should not be more than 15/1000 cases. In the present time, there are more complaints in obstetrics from the Thailand Nursing Council meeting regarding the medical team, such as doctors and nurses. We have to prepare by taking care of them by heart and learn more to manage the risk management by the client. They should participate in the promotion of the health to the pregnancy women because it is very important for the next generation of population.

Pender said the person can do activities to do health promotion from cognitive factors feeling to behaviors. The model of life health promote composed of 6 parts. There are activities by physical nutrition, interpersonal relationship, development of spiritual and stress management. If the pregnant women have health behavioral promotion it can help the level of their health and the infant. By perceived benefit and health promotion behaviors in pregnant women (Cumpsri, 2005; Lonuch, Niratharadorn, & Kumpalikit, 2011) found that benefit and health promotion behaviors in pregnant women at the south of Thailand has relationship in positive way. The research found that age, level of education and income have relationship in positive way to self-care in teenage pregnancy (Changerajar, 2013).



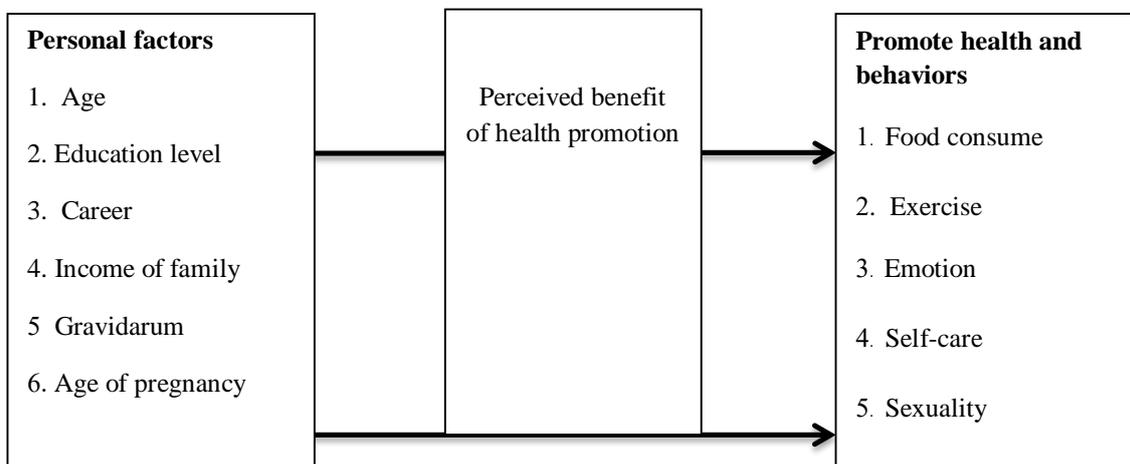
By the reason, during the pregnancy there are changes in physical and mental health to effected the problem from inappropriate self-care to infant baby .We should encourage the pregnant women perceived benefit and health promotion behaviors in pregnant women. I am an instructor who teaches the nursing students at antenatal service and interested perceived benefit and health promotion behaviors in pregnant women in order to help and develop the behaviors in pregnant women.

Objective of the research

1. To study about the benefit of promote health and behavioral of pregnant women
2. To study the relationship of the person income of family and behavioral of pregnant women

The Research Framework

Personal: Factors and knowledge factors and outcome pregnant women
Experience: Cognitive to the behavior



Population and sampling

The research is quiescence–experimental research to study about the effect of perceived benefit and health behavioral of pregnant women and personal factors and knowledge, and promote health and behavioral of pregnant women

Population

The pregnant women at antennal clinic at Phrananngkiao hospital who visit ANC.

The sampling

The pregnant women at antennal clinic at Phrananngkiao hospital who visit ANC and select the sampling by purposive sampling by the criteria as followed:

1. Normal pregnancy
2. Can communicate and understand
3. No disease during pregnancy
4. Cooperate to do research

By calculate the sampling G –Power Collect the data.

After the research was approved by Ethic Committee of Suansunandha Rajaphat University, there were further procedures as followed:

1. The researcher asked permission from head ward at antenatal care.



2. The researcher selected the sampling from the book of ANC and performed self-introduction and informed the objectives of the research.
3. After the sampling, there were cooperating and answering the questionnaires on perceived benefit and health promoting behavior in pregnancy.

The Research Tools

1. The questionnaires personal factors age, education level, carrier , income of family Gravidarum and age of pregnancy
2. The questionnaires about health promotion behaviors in pregnancy composed of food consumption, exercise, emotion, self-care and sexuality.

Data Analysis

The SPSS program was used to compute data, and the data was analyzed as following steps which were:

1. Calculate by percentage of present and data during pregnancy.
2. Find the average and standard deviation of previous benefit of knowledge and behavior health promotion.

RESULTS

Data personal

Data personal	total	percentage
Age		
Less than 20 years	4	20.0
21 – 30 years	12	60.0
31 years	4	20.0
Status		
Married	20	100.0
Single		
Level of education		
Uneducated	4	20.0
Primary school	1	5.0
Secondary school	9	45.0
Diploma	2	10.0
Bachelor	4	20.0
Career		
Unemployed	2	10.0
Agriculture	1	5.0
Government officer	2	10.0
Hire	4	20.0
trading	8	40.0
House wife	3	15.0
Income of family		
Less than 5000 baht	3	15.0
5001 – 10000 baht	8	40.0
10001 – 15000 baht	5	25.0



Data personal	total	percentage
more 15000 บาท baht	4	20.0
Pregnancy sequence		
first	11	55.0
other	9	45.0
Abnormal signs before pregnant		
no	19	95.0
no	1	5.0
no	1	100.0
Age of pregnancy		
Under 12 wks	6	30.0
13 – 20 wks	7	35.0
21 – 26 wks	4	20.0
27 - 32 wks	3	15.0
Underlying disease		
no	20	100.0
Complication during pregnancy		
no	20	100.0

Compare the scores before and after receiving the knowledge of health promotion program by statistic paired t-test

time	Mean±S.D.	t	df	p-value
pre	17.20 ± 2.31	-.066	19	.948
post	17.25 ± 2.73			

Compare the scores before and after promoting health and behavioral program by statistic paired t-test

time	Mean±S.D.	t	df	p-value
pre	95.80 ± 10.34	-1.56	19	.138
post	100.25 ± 8.78			

From the table, data was collected from 40 person pregnant women who are not received health promotion .More than a half (60%) were 21-30 years old and 100 % were married .Almost half (45%) graduated high school while 20% graduated in bachelor degree. The number of subject 75 % has income .Almost half had their income less than 10,000 baht per month.

Perceived benefits scores were at good level (mean = 17.25, S.D. = 2.73) as well as the score after receiving health promotion was higher, and the health promotion behaviors scores was also higher (mean =100.25, S.D. = 8.78). Both perceived befits and health promotion behaviors were positively related to the health promotion.



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The Results of Play Activities for Caregivers towards Early Childhood Development Promotion

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ABSTRACT

A play activity is one of the important things to promote early childhood development that helps children to think and learn better. The understanding of the process of play can help the caregiver to manage play activities which are suitable for each child in order to keep the children ready to learn mature adults. The objective of this study was to compare the caregiver's behaviors before and after participating in promotion activities of early childhood development promotion. The research design was Pretest-Posttest Design using random assignment to select the district, and then select the samples by purposive sampling. The participants were 30 caregivers who were responsible for the care of children aged 5 years and 11 months in Dusit District, Bangkok. The research findings reveal that after receiving the play activities, the mean score was higher than before participating with statistical significance ($p < .05$). When classify by each category, it was found that the promotion scores after participation were higher than before participation in all activities which were Availability of Learning Materials, Reading Preparation, Parental Involvement in Developmental Advance, and Parental Verbal Responsive Behaviors. Suggestion from this research was that the training activities should be organized to encourage caregivers to understand the importance of play in promoting early childhood development under caregivers in all sectors both in urban and rural areas. Moreover, it should have the long-term follow-up of caregivers to maximize the efficiency of activities and meet the needs of children.

Keywords: *Play Activities, Caregivers, Early Childhood Development*

INTRODUCTION

Background and Significance of the Problem

It is truly significant for the well-being of Thai children to receive proper care since these children are growing up into adults and considered as the future of the nation in the years ahead. If they are provided with health promotion appropriately with age in physical, psychological, emotional, social, and developmental aspects from caregivers, the nation would have high quality people who are capable of prospering the nation to keep up with other nations worldwide in the future. However, according to the child development survey IV conducted by National Health Examination Surveys (NHES) Office during 1991–2009, it was found that children had probable developmental delays and developmental delays accounted for 18.3%-25.3%, 2-3 times higher than that in the overseas (Ruangdarakanon, 2011; NHES Office, 1991-2009). In 2015, another survey also reported that there were 19.41% of children with developmental delays (Ministry of Public Health, 2015). Developmental delays have impacts on children's learning development (Ruangdarakanon, 2011), cognition, expression, and executive functions (Law, Rush, Anandan, Cox, & Wood, 2012; Peyre et al., 2014; Reilly, Bernal, Cortes, Gomez-Vasquez, Tohme, & Beeching, 2007). In such circumstances, those who were considered as the future of the nation were likely not to keep up with other nations worldwide.

To achieve satisfactory development and growth, children need to rely on their parents who can help prevent harms against them. In the case that children receive affection and close care with understanding, they are ready to fulfill their fundamental requirements appropriately with age in physical, psychological,



emotional, intellectual, and social aspects, as well as growing strong, feeling cheerful, having mental security, possessing literacy skills, seeking knowledge, and performing good deeds (James, Nelson, & Ashwill, 2007). In this regard, children will be prepared to develop themselves to be both talented and good people who live happily in the society. Therefore, it was quite important for caregivers, surrounding people and environment to promote development of early childhood since these children required to learn in the surrounding environment through all of 5 recognized senses (Ritthakananon, 2006; Kochapakdee, 2011). This results in the development which is the basis of personality, character, and growth in physical, psychological, intellectual, and competence aspects because the nervous system and brain of these children will reach the maximum growth rate (James & Ashwill, 2007).

The promotion of child development could be implemented in a various ways, such as reading books for them, listening to music, and doing play activities. Play activities and children are inseparable, being a natural instinct. Through the play activities, children can enjoy learning the nature and environment, enabling them to gain experience and knowledge through seeing, hearing, and picking. This can develop all aspects including visual and auditory senses. When children are joyful, their emotional development will be stimulated, and their psychosocial aspect will be also enhanced if they play together with other people (Kuhapinan, 1999; Ruangdarakanon, 2011). Experience gained from the play activities will encourage children to develop their responsibilities toward themselves and other people, as well as enable them to adjust themselves to other people and the society smoothly and happily. Therefore, the play activities are regarded as a key to promoting development and competencies of children, as well as being quite important to the brain growth, and physical, social, emotional, and intellectual development (Narongraj, 2000; Chittayasothorn, 2009; Silpa, 2002; Janthasorn, 1999). As a result, children will be able to live in the society when growing up, and become good adults in the future.

The researcher held the play activities, aiming to promote child development through playing so that caregivers could learn and gain understanding about the playing process in accordance with each child in care. As a result, children’s development will be promoted appropriately with their age. Then, children will be prepared to learn and grow up as competent adults who can prosper the nation in the future.

Research Hypothesis

Health promoting behaviors of early childhood performed by caregivers before and after joining the activities were different.

Research Objectives

In this study, the researcher aimed to explore effectiveness of play activities for promotion of development, with the following sub-objectives:

1. To explore health promoting behaviors of early childhood performed by caregivers before joining the activities.
2. To explore health promoting behaviors of early childhood performed by caregivers after joining the activities.

Conceptual Framework

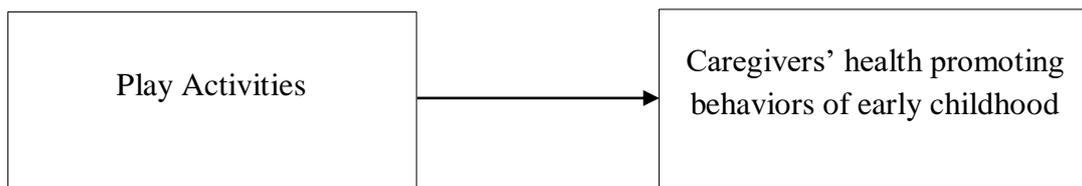
In this study, the researcher applied Bandura’s Social Learning Theory (Bandura, 1986) suggesting that the observational learning is the cognitive process or intellect. In this regard, human have learned through observation or imitation because human usually interact with surrounding environment (Sirijantho, 2014). Human learning mostly involves the observational learning and modeling. There are 2 types of models which are live model and symbolic model.

The learning process through observation and imitation starts when a person is exposed to a stimulus or has a data input, consisting of 2 steps including Step 1: Acquisition - participants can express their



behaviors, and Step 2: Performance – there will be either action or non-action. Therefore, the learning through modeling needs to rely on the interesting and attractive presentation so as to create 4 learning processes as follows: Attention – participants pay attention to models, while models have to be interesting and outstanding enough to draw attention of participants; Retention process – participants can remember what they observed and imitated even after a long time ago; Reproduction –participants can act or perform behaviors similarly to models; and Motivation – participants imitate and perform behaviors similarly to models that they observed in the expectation that it will be useful.

In the promotion of development through play activities, simple toys are prepared to be played with children so that caregivers can use the toys to play with children on their own. In addition, there are playing procedures to draw attention from children, being adjusted in line with children’s age so that caregivers can play with children accordingly. When caregivers have accurate knowledge and understanding that correspond to their children’s age, caregivers will be able to hold play activities at home. If caregivers gain better knowledge and understanding, parents will have better health promoting behaviors, and fulfill basic requirements with age-related changes appropriately to keep balance between physical, psychological, emotional, intellectual, and social aspects, so children will grow strong, feel cheerful, have mental security, possess literacy skills, seek knowledge, and perform good deeds (James, Nelson, & Ashwill, 2007).In this regard, children’s development will be enhanced as shown in Figure 1:



Scope of the Research

1. Scope of the area included Dusit District, Bangkok. The simple random sampling was conducted in 5 Sub districts, and the purposive sampling was conducted in the randomly chosen Sub district.
2. Scope of the content consisted of documents relating to early childhood, development of childhood, caregivers’ health promoting behaviors of early childhood, child rearing, and caregiver style.

RESEARCH METHODOLOGY

Population and Sample

The research was in the form of a pretest-posttest design that the evaluation was made before and after joining the activities. Population – The population in the study were caregivers who took care of children aged less than 3 years old in Dusit District, Bangkok. Sample – The samples in the study were chosen by the purposive sampling from the population with the following criteria: Inclusion criteria –Serving as main caregivers who took care of children for not less than 6 months, being able to communicate in Thai, voluntarily participating in the study, and never join any activities for promotion of development; Exclusion criteria – Caregivers had visual or hearing impairments.

Research instruments

The research instruments consisted of the following:

1. The instruments for the experiment

The instruments for the experiment included the play activities for promotion of development. The activities were held to encourage caregivers to promote children’s development through playing toys at home, or choosing toys appropriately with age-related development as per the following details:



1.1 To provide knowledge through giving lectures and documents relating to age-related development of early childhood, appropriate toys or activities, and benefits of playing. This activity took 2 hours.

1.2 To join activities at the station to learn from the demonstration on how to play with children in each age group. Each station was put emphasis on encouraging caregivers to involve in autonomously choosing toys or using proper gestures under the supervision of facilitators at the station so that caregivers gained understanding and put into practice accordingly and appropriately for utmost benefits. This activity took 3 hours.

2. The instruments for the data collection consisted of the following:

2.1 The questionnaire on general information of children required caregivers to administer the fill in the blank and multiple choice questions namely, age, gender, gestational age, birth weight, having twins, birth rank, and number of siblings.

2.2 The questionnaire on general information of caregivers required caregivers to administer the fill in the blank and multiple choice questions, comprising kinship between caregivers and children, marital status of parents, education of fathers, education of mothers, occupation of fathers, occupation of mothers, average family income, relationship between children and caregivers, and doing activities with children.

2.2 The StimQ-T questionnaire involved caregivers’ health promoting behaviors of children aged 1-3 years old while staying at home. This questionnaire required caregivers to administer the fill in the blank and multiple choice questions, comprising 4 items. The answer choices were Yes or No. Total scores ranged from 0-39 points which 0-13 points indicated a low level of caregivers’ health promoting behaviors of early childhood, 14-26 points indicated a moderate level of caregivers’ health promoting behaviors of early childhood, and 27 points and above indicated a high level of caregivers’ health promoting behaviors of early childhood.

Protection of Participants’ Rights

This study gained approval from the Ethical Review Committee for Human Research of Suan Sunandha Rajabhat University as per the approval. Prior to the study, the researcher was informed about the objectives, practices of research participation, duration, and benefits from participating in the study. The samples acknowledged that they could withdraw from the study at any time with no effects on them. The researcher asked the samples to agree to participate in the study by signing the consent form. The participants could ask for more related information throughout the study. The overview of the data were summarized and presented, while the personal data of participants were not disclosed.

Data Collection

After submitting the request and gaining approval from the Ethical Review Committee for Human Research of Suan Sunandha Rajabhat University, the researcher and research assistant sent the letter asking for permission from the Public Health Center at which the data would be collected. Then, the samples who were chosen by the purposive sampling were contacted by using the questionnaire on general information, such as the questionnaire on general information of caregivers, the questionnaire on general information of children, and the StimQ-T questionnaire. Also, the samples were required to join the play activities for promotion of development as follows:

1. The researcher and research assistant were prepared to conduct the study by practicing how to use the questionnaire on health promoting behaviors, and seek understanding about the play activities for promotion of development participated by 10 caregivers of preschool children.

2. The research assistant was prepared taking charge of choosing the samples according to the inclusion criteria, distributing the questionnaire on general information, such as the questionnaire on



general information of caregivers, the questionnaire on general information of children, and the questionnaire on health promoting behaviors to be responded by caregivers before joining the activities. Prior to the data collection, the researcher explained details of activities, how to use the questionnaire, and responsibilities of the research assistant so that the research assistant gained understanding and acknowledged the role in conducting the study. Moreover, the research and research assistant discussed with each other about the activities on a regular basis before and after administering the questionnaire.

3. The Public Health Center and village health volunteers (VHV) were coordinated for explanation of the data collection. The researcher made self-introduction with caregivers, and invited caregivers to participate in the study, as well as requesting them to sign the consent form.

4. The participants were required to respond to the questionnaire on general information of caregivers, the questionnaire on general information of children, and the StimQ-T questionnaire before the activities, while collecting the data from the samples in a private room for approximately 10-15 minutes.

5. The knowledge on the play activities for promotion of development was provided as follows:

5.1 To provide knowledge through giving group lectures and documents relating to age-related development of early childhood, appropriate toys or activities, and benefits of playing. This activity took 2 hours.

5.2 To join activities at the station to learn from the demonstration on how to play with children in each age group. Each station was put emphasis on encouraging caregivers to involve in autonomously choosing toys or using proper gestures under the supervision of facilitators at the station so that caregivers gained understanding and put into practice accordingly and appropriately for utmost benefits. This activity took 3 hours.

6. The health promoting behaviors through the play activities were re-evaluated after 4 weeks by the StimQ-T questionnaire.

Data Analysis

After completing the data collection, the data were checked to ensure completeness and accuracy. Then, the data analysis was made by using SPSS program. The statistical level was determined at .05. General information were analyzed by using mean and percentage. The comparison of health promoting behaviors through playing was made by using Paired Samples T-Test.

Results

Table 1: General Information of Children (N = 30)

Description	Number	%
Age		
Newborn - 11 months	8	26.67
1year- 1year 11 months	9	30.00
2years - 3years	13	43.33
Gender		
Female	17	56.67
Male	13	43.33
Birth rank		
1 st child	18	60.00
2 nd child	11	36.67
3 rd child	1	3.33
Number of members at the same household		
1-4 persons	20	66.67
More than or equivalent to 5 persons	10	33.33



Table 2: General Information of Caregivers (N = 30)

Description	Number	%
Kinship between children and caregivers		
Mother	13	43.33
Father	6	20.00
Maternal grandmother	8	26.67
Paternal grandmother	3	10.00
Marital status of parents		
Married	20	66.67
Divorced	5	16.67
Separated	2	6.67
Fathers or mothers were dead	3	10.00
Education of fathers		
Mathayomsuksa 6 and above	21	70.00
Lower than Mathayomsuksa 6	9	30.00
Education of mothers		
Mathayomsuksa 6 and above	22	73.33
Lower than Mathayomsuksa 6	8	26.67
Occupation of fathers		
Working permanent job outside home	24	80
Others	6	20
Occupation of mothers		
Working permanent job outside home	17	56.67
Others	13	43.33
Average family income		
Less than or equivalent to 20,000 baht/month	19	63.33
More than or equivalent to 20,000 baht/month	12	40.00
Relationship between children and caregivers		
Good relationship	27	90.00
Have occasional disputes	3	10.00

Hypothesis Testing

As for caregivers’ health promoting behaviors of early childhood, it was found that mean scores before and after the activities were different with a statistical significance ($p < .001$). The scores after joining the activities were higher than before joining the activities (Table 3).

Table3: Comparison of Mean Scores of Caregivers’ Health Promoting Behaviors between before and after the Activities (N = 30)

Before the activities		After the activities		t	p-value
Mean	S.D.	Mean	S.D.		
28	5	35	1.043	14.524	.000



DISCUSSION

Caregivers earned a high level of scores regarding health promoting behaviors of children since most caregivers are mothers of these children. Mothers are in charge of giving affection and close care, as well as raising children with understanding, and fulfilling basic requirements with age-related changes appropriately to keep balance between physical, psychological, emotional, intellectual, and social aspects, so children will grow strong, feel cheerful, have mental security, possess literacy skills, seek knowledge, and perform good deeds (James, Nelson, & Ashwill, 2007). Therefore, they gained understanding about children, and were prepared for promotion of development. In addition, in the play activities, simple toys were prepared to be played with children so that caregivers could use the toys to play with children on their own. In addition, there are playing procedures to draw attention from children, being adjusted in line with children's age so that caregivers can play with children accordingly. When caregivers have accurate knowledge and understanding that correspond to their children's age, they will be able to hold the play activities at home (James, Nelson, & Ashwill, 2007).

When considering each item, it was also found that the item regarding the development of self-adjustment and fine motor skills earned the lowest scores even though most caregivers achieved the level of education based on Thailand's basic education system, and had a chance to seek information and gain understanding about how to provide children with equipment for promotion of development. This is probably because the said equipment needs to be purchased, while most caregivers earned less than 20,000 baht per month, and live in the extended family consisting of 5 family members and above, so they might face the problem regarding expenses of equipment for promotion of development.

IMPLICATIONS

1. The study on the broad picture of caregivers' health promoting behaviors of early childhood in each region of Thailand should be conducted due to different context in each area.
2. The study on caregivers' health promoting behaviors of early childhood in Well Baby Clinics of Sub-district Health Promoting Hospitals should be conducted in order to provide the data accessibility for all groups of people.
3. The study on the development and growth of children receiving care from different caregivers should be conducted in order to make comparison and develop the activities which could most fulfill children's requirements.
4. Next study should comprehensively control extraneous variables possibly affecting caregivers' health promoting behaviors of early childhood.



The 80th Anniversary of Suan Sunandha Rajabhat University

“International Conference on Innovation, Smart Culture and Well-Being” (ICISW2018)

8th November 2018, Suan Sunandha Rajabhat University, Bangkok, Thailand



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Relationship between Running in the Morning and Related Factor Effect on Sleeping in Elderly

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ABSTRACT

The aim of the study was to examine the effect of running in the morning and related factors on quality and quantity of sleeping in elderly. The related factor included general information, underlying disease, bedroom environment, caffeine drinking and dinner time. For quality of sleeping, participant would report themselves. In addition, wakeup time, sleeping time, sleeping hours, and midnight wakeup were reported in quantity of sleeping. The study instrument was questionnaires which applied from Pittsburgh Sleep Question. Participants were 60-75 years old (mean = 66.90, SD. = 4.16). The participants were divided into two groups; 60 participants were elderly who run in the morning, and 60 participants who did not exercise (control). Data was analyzed using descriptive statistics and t-test. The result showed that elderly who run in the morning had significance longer time to sleep (mean = 7.35 hours, SD = 0.43) than control (mean = 5.8 hours, SD = 1.52) ($p < 0.01$). In addition, elderly who run in the morning had significance light disturbed during sleeping than control ($p < 0.01$). The result indicated that elderly who run in the morning had quality and quantity sleeping than control.

Keywords: *Sleep, Elderly, Running in the Morning*

INTRODUCTION

It is claimed that elderly population increase dramatically around the world (van Heemst, 2018). In Thailand, National statistic official reported that the number of elderly people increase gradually from 6.8 percent in year 1994 to 14.9 percent in year 2014 (Ministry of Information and Communication Technology of Thailand, 2018). Aging is a complex process that is accompanied by damage to cellular component. The cell accumulation is damaged as a result of oxidation, and inflammation (Zhang, Chen, Yang, Xu, Chen, Gao, & Stetler, 2018). These processes lead to degenerative disease, such as Hypertension disease, Diabetes mellitus, Heart disease, Dementia, and Alzheimer’s disease. Previous evidence indicated the causes of these diseases are, for example, do not exercise, impaired nutrition, and sleep problem. Therefore, sleep plays an important role in elderly. Sleep is one third of daily activities. The American Academy of sleep medicine and sleep research society suggested that elderly should sleep seven to nine hours for achieve optimal health (Lubetkin & Jia, 2018). However, previous research exhibited that elderly people had changed sleep pattern. They had decreased sleep hours and sleep quality (Tel, 2013; Mander, Winer, & Walker, 2017; Bonardi, Lima, Campos, Bertani, Moriguti, Ferrioli, & Lima, 2016; Cordi, Hirsiger, Mérrillat, & 2015; Dossey, 2013; FitzGerald, O’Regan, Adamis, Timmons, Dunne, Trzepacz, & Meagher, 2017; Germain & Buysse, 2011; Hot, Zsoldos, & Carrier, 2015; Rodriguez, Dzierzewski & Alessi, 2015; Sforza, Saint Martin, Barthélémy & Roche, 2016; Zalai,



Bingeliene & Shapiro, 2017; Zheng, Chen, Chen, Zhang & Wu, 2014; Zhi, Sun, Wang, Cai, Li, Li, Xu, Wang, Chu, Wang & Jiang, 2016). In biological sleep level, there were many sleep change such as earlier bedtime and rise time, longer time to fall asleep, shorter sleep duration, easy awake during sleep, and reduce deep sleep (Mander, Winer, & Walker, 2017). Therefore, previous evidence exhibited the way to solve these problems. Many researches indicated appropriate exercise help promote quality of elderly life (Cordi, Hirsiger, Méritlat, & Rasch, 2015; Galloza, Castillo, & Micheo, 2017). However, there were no evidence of running in the morning promotes sleeping in elderly. The author would be interested in this relationship.

As we known that elderly people is the period that cell degeneration process effect on physical and mental health impairment. Therefore, previous researches presented the several methods to protect and promote quality of life in elderly. Sleep is an important activity which spends one third of daily life activities. Eighty percent of elderly had sleep problem (Lubetkin, & Jia, 2018). Therefore, this study focuses on sleeping in elderly which promoted by running in the morning. We hypothesized that running in the morning enhance the sleeping quality and sleeping quantity in elderly than control. Therefore, the objective of this research is to study the effect of running in the morning on sleep quality and quantity. The result of the study will inform elderly people to exercise especially running in the morning for physical and mental health quality.

MATERIALS AND METHODS

Participants

This study involved 120 Participants. They were 60-75 years old (mean=66.90, SD= 4.16). Participants divided into two groups; 60 were elderly who run in the morning and 60 were elderly who did not exercise (control). They had lived in Bangkok province. All participants were healthy. They did not have any visual and auditory problems. They did not have any diagnosed psychological problems.

All participants provided signed informed consent, and participated in experimental procedures in this study were carried out in accordance to the protocol approved by Suan Sunandha Rajabhat University Ethics Committee (COA. 1-023/2018).

Sleep Questionnaire

The data collected from the questionnaire which applies from the Pittsburgh sleep quality index. It contained 31 questions; eight questions were characteristic of participants, twenty questions were sleep (quality of sleep, quantity of sleep, sleep latency, length of sleep, sleep habits, napping in daytime, sleep disorder, and using sleeping pills were included).

Data Analysis

The data were analyzed by using SPSS 22.00. For the analysis of the descriptive data (i.e., percentage, mean, and standard deviation), the independence sample t-test was employed to analyze the quality and quantity of sleep compared between participants who running in the morning and who did not exercise.

RESULTS

The research results were presented in three sections including characteristics of participants, sleep data and sleep problem.

1. *Characteristics of participants*—there were 120 participants joined in the study. They were 60-75 years old (mean = 66.90, SD = 4.16). The general characteristic present in table 1 and drinking a cup of coffee or tea presents in table 2.



Table 1: General characteristic of participants

N=120	Mean±SD (Running) n= 60	Mean±SD (control) n=60
Age	65.91±3.89	68.11±4.4
Gender		
Male	36.4%	55.6%
Female	63.6%	44.4%

Table 2: Drinking a cup of coffee and tea

N=120	Mean±SD (Running) n= 60	Mean±SD (Control) n= 60	t	p-value
A cup of tea	1.00±1.10	.67±1.12	.671	.619
A cup of Coffee	.73±.48	1.67±1.50	-1.97	.056

2. *Self-report of sleep data*—this data presented sleeping time compared between elderly who run in the morning and control group (Table 3). The sleeping time included wakeup time, onset of sleeping time, sleeping hours and napping hours. The result revealed that elderly who run in the morning had significant longer sleeping hours than control group (7.35±.43 hours and 5.81±1.51 hours, respectively) (*p-value* <.001). In addition, elderly who run in the morning had significant late onset of sleeping time than control group (22.21±0.60 and 20.81±7.12, respectively) (*p-value* <.05).

Table 3: Sleeping time

N=120	Mean±SD (Running) n= 60	Mean±SD (Control) n= 60	t	p-value
Wakeup time	5.47±0.62	5.14±0.92	-1.189	.476
Sleeping time	22.21±0.60	20.81±7.12	.652	.039*
Sleeping hours	7.35±.43	5.81±1.51	3.237	.000***
Napping hours	0.42±.65	0.21±0.33	.863	.086

3. *Self-report of sleep problem*—the data of sleep problem included the questions which asked participants about sleep problem, wakeup in night, noise problem, and light problem during sleep. The results showed that elderly who run in the morning reported they had sleep problem lower than control (not significant difference). Moreover, Control group reported they had significant noise problem and light problem during sleep in the night presented in table 4.

Table 4: Sleeping problems

N=120	Percentage (Running) n= 60	Percentage (Control) n= 60	t	p-value
Sleep Problem			1.796	.089
Yes	18.2	55.6		
No	81.8	44.4		



Midnight Wakeup			.659	.193
Yes	63.6	77.8		
No	36.4	22.2		
Noise Problem			1.342	.010*
Yes	9.1	33.3		
No	90.9	66.7		
Light Problem			2.814	.000**
Yes	0	44.4		
No	100	55.6		

CONCLUSION AND FUTURE WORK

The present study demonstrates the effect of running in the morning on sleeping in elderly. The result reveals that elderly people who run in the morning presented longer time to sleeping than control. In addition, elderly people who run in the morning had significance on light disturbed during sleeping than control. The author suggests that elderly people who run in the morning had higher quality and quantity sleeping than control.

For the future research, the author suggests to explore more on the relationship between sleep quantity, sleep quality and running in multi-method and multi-information approaches.

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