



กลุ่มที่ 1

บทความระดับนานาชาติ (International Papers)



Room 1

Education, Liberal Arts, Tourism,
Political Science, Fine Arts

UNIVERSITY STUDENTS' PERCEPTIONS OF CYBERBULLYING: A RESEARCH ON GENDER DIFFERENCE IN THAILAND

Assistant Professor Supavadee Nontakao, Ph.D.

Sritapum International College, Sripatum University

E-mail: supavadee.no@spu.ac.th

Assistant Professor Papada Lyn Pitchayachananon, Ph.D.

British College, Sripatum University

E-mail: papada.pi@spu.ac.th

ABSTRACT

The objectives of this study are to investigate the perceptions of cyberbullying of university students, to explore their perceptions of factors associated with cyberbullying and to investigate the gender difference on factors associated with cyberbullying. This study was conducted with university students who were 17-25 years of age. Results indicate that is no difference between the proportions of male and female university students reporting both cyberbullying the others or being a victim of cyberbullying. However, females tend to perceive “non-confrontational” as a motivation to cyberbullying more than males. Females tend to perceive anxiety emotion to cyberbullying more than males. However, males tend to perceive emotion of powerlessness to cyberbullying more than females. Lastly, females tend to perceive avoidance reaction to cyberbullying more than males.

Keywords: Gender difference, Cyber bullying, Motivation, Emotion, Reaction

1. Introduction

Thailand's internet penetration rate is ranked among the top in ASEAN. In the last six years, the penetration rate is 11.5%. Based on a survey by the Electronic Transactions Development Agency (ETDA), school students and university students are the group that has the highest internet penetration rate of 76% and spend 12.43 hours per day. Thailand is suffering from not only internet addiction, but also cyberbullying, in which people are both bullies and victims. There are various forms of cyberbullying that involve different motivations, impacts and reactions. However, few studies have focused on young adults' perception of cyberbullying.

Cyberbullying is defined as “... involves the use of information and communication technologies such as email, cellphone and text messages, instant messaging, defamatory personal websites, and defamatory online personal polling websites to support deliberate, repeated and hostile behavior by an individual or group that is

intended to harm others (Burton & Mutongwizo, 2009). Cyberbullying is a growing phenomenon in our society with the technological advancement. Harassment and hostility continue to be evident on digital media in society.

Cyberbullying hurts victims physically and emotionally. The feeling of embarrassment causes the victim to isolate himself from friends and family, losing self-esteem and experiencing depression. Many victims blame themselves for being different and lose sleep and appetite. In severe cases, victimized persons may hurt themselves or commit suicide. Hence, communities and concerned authority need to pay attention, taking on a very important role in grooming adolescences to be digitally literate and capable of managing cyberbullying.

University students were chosen for this study because adolescence is an age period when physical aggression increases in frequency and intensity; it has been labeled a brutalizing period. This period also witnesses a series of abrupt changes in the social lives of youngsters.

2. Research Objectives

The main objective of this study is to collect useful data on the university students, their usage of social media and their perception on cyber bullying in order to add up more insight information for any related organizations to plan an effective policy to prevent and/or remedy cyber bullying. Specifically, the objectives of this study are the following:

1. To compare male and female university students' experiences in relation to cyberbullying;
2. To explore their perceptions associated with cyber bullying; and
3. To investigate the gender difference on perceptions associated with cyberbullying.

3. Related Literature Review

3.1 Cyberbullying and Its Impacts

Cyberbullying can occur in blogs, websites, emails, chats, instant messaging, and text/digital image messaging via mobile devices. It can relate to gender, racial, religious, and cultural biases. Digital technology inadvertently becomes bullies' weapon, sending mean messages to targets easier, faster, more intensely and more publicly involved. Bullies can use fake identity on social media to attack victims repeatedly.

The literature suggests that victims of cyberbullying generally manifest psychological problems such as depression, loneliness, low self-esteem, school phobias and social anxiety (Akcil, 2018). Under great emotional stress, victims of cyberbullying are unable to concentrate on their studies, and thus their academic progress is adversely affected (Akcil, 2018). Moreover, research findings have shown that cyber bullying causes emotional and physiological damage to defenseless victims as well as psycho-social difficulties including behavior problems (Akbulut and Eristi, 2011). Since the victims are often hurt psychologically, the depressive effect of cyberbullying prevents students from excelling in their studies (Faryadi, 2011). The overall presence of cyberbullying victimization among university students was found to be significantly related to the experience of anxiety, depression, substance abuse, low self-esteem, interpersonal problems, family tensions and academic underperformance (Mason, 2018).

3.2 Cyberbullying and Its Motivations

Researchers have investigated motivations for cyberbullying. Two common and inter-related motivations include anonymity and the disinhibiting effect (Faryadi, 2011). Mason (2018) described how anonymity breeds disinhibition due to the distance provided by electronic communication. Additional motivations include homophobia, racial intolerance, and revenge (Mason 2018). In this study the motivation for cyberbullying was defined as the reasons for cyberbullying provoked by the characteristics of the cyber victim or by something specific to the situation. They are “no consequences”, “non-confrontational”, and “target was different” (Molluzzo and Lawler, 2012).

- “No consequences” is the cyberbully’s feeling that he or she can get away with cyberbullying without fear of ramifications, physical retaliation from the victim, a permanent consequence (e.g., jail time), or witnessing an emotional reaction from the victim.

- “Non-confrontational” is identified when a cyber bully does not want to have a face-to-face encounter with the victim or expresses fear of facing the person; people often feel that cyberspace is impersonal, and they can therefore say whatever they want.

- “Target was different” is referred to a cyberbully’s motivation based on the victim appearing different, having a negative reputation, or standing out in a way that the cyberbully perceives as negative.

3.3 Cyberbullying and Its Reactions

The reacting behaviors that the victims display against the aggression or the aggressor because of their emotional state are a very important issue. The type of reaction can turn the existing situation into a more complicated one, or even a non-proportional reaction can convert the victim into a bully (Eristi & Akbulut 2017). Several classification headlines regarding the reactions exhibited by the victims, which include seeking vengeance from the bully (Eristi & Akbulut 2017), establishing dialogue with the bully, forgiving (Safaria et al. 2016), ignoring the attack, and avoiding (Cao & Lin 2015). Eristi (2019) used four factors: revenge, precaution, dialogue, and avoidance in his research. Additionally, there are numerous variables being influential over the reactions that victims can adopt against cyberbullying, which include the type and severity of bullying behavior (Beran et al. 2012), personality traits of the victim (Elledge, 2013), previous experience with such an aggression (Beran et al. 2012), gender (Hinduja & Patchin 2011), and age (Sourander et al. 2010). In this research the reactions used are precaution, ignoring, avoidance, and revenge.

3.4 Cyberbullying in Thailand

Thailand’s National Report 2020 published by Child Online Safety Index (COSI) indicates that Thai children aged 8-19 years old encounter cyber risks at a much higher rate than their counterparts in other countries (47% to 37%). Thai boys are at greater risk than girls (53% to 41%). And almost half of Thai children aged 8-12 years old have been bullied or witnessed bullying online while the global average is 29%. Besides cyberbullying, COSI also reports the other cyber risks against children including disordered use of technology, risky contents, risky contacts, cyber threats, and reputational risk. The other study shows that around 43% of Thais aged between 12 and 24 years have been victims of online bullying. (Unintentional & Intentional Cyberbullying, 2021)

There were many gender differences, with girls recommending telling and reporting more, for both traditional and cyber victimization. Girls also recommended ignoring it more, or blocking messages; while boys recommended fighting back, but also making new friends. There were few differences by religion. Victims were more likely to recommend passive strategies such as avoiding the cyberbully, or risky ones such as fighting back (Ruthaychonnee and Smith, 2018).

In addition, one study produced direct evidence regarding cyberbullying in Thailand. A report on cyberbullying by Boonoon (2019), in an online newspaper 'The Nation', discussed findings from a survey conducted in August 2019 by the Wisdom Society for Public Opinion Research of Thailand, a private organization concerned about the welfare of Thai children. This report cited cyberbullying as a situation when a child or teenager is repeatedly tormented, threatened, harassed, humiliated, embarrassed, or otherwise targeted by another child or teenager using text messaging, e-mail, instant messaging or any other type of digital technology. The survey involved 2,500 students around the country, aged 12 to 24 years; 970 were vocational students and 1,530 were general students. It was found that 43% of students had been threatened over the Internet. Most of them, studying at high school, declined to disclose details, but said they had been annoyed by the cyberbullying and particularly by attempts to lure them into offline meetings. Few parents or teachers were told of bullying episodes.

Songsiri and Musikaphan (2011) reported findings from 1,200 pupils aged mostly 14-16 years, from 21 schools in Bangkok. The date of the survey is not reported. For this sample, ICT penetration was very high; 96% owned a mobile phone, and 95% used the internet. Seven types of cyberbullying were reported: electronic messages with angry and vulgar language; repeatedly sending nasty, mean and insulting messages; talking someone into revealing secrets or embarrassing information, then sharing it online; sending or posting gossip or rumors about a person to damage his or her reputation or friendships; pretending to be someone else and sending or posting material to get that person in trouble or danger or to damage that person's reputation or friendships; repeated intense harassment and denigration including threats; and intentionally and cruelly excluding someone from an online group. Of these, the first two were the most frequent. However, their frequency measures are difficult to interpret, as they included both the experiencing these yourself, or the hearing about them occurring to their friends; in addition, no definition of cyberbullying is given. Duration of internet use and aspects of family relationships (exposure to violence; family income) were found to relate to the cyberbullying measures, but no details of these findings are presented.

3.5 Gender and Cyberbullying

The nature of information and communication technology makes it possible for cyberbullying to occur more secretly, spread more rapidly, and be easily preserved. Cyberbullying indeed occurs; yet it is unclear whether gender plays a role in cyberbullying. The term gender, in addition to recognizing the influence of biological factors, includes cultural and experiential factors to explain aggressive behavior. Thus, gender not only implies the categorization of people into male or female groups, but also refers to the gender typing process in which they acquire those motives, values and behaviors viewed as appropriate for males and females within a given culture (Yehuda, 2019).

Gender studies on cyberbullying have attempted to determine which gender is more involved in cyberbullying victimization and perpetration. However, research has shown mixed results and we cannot affirm that cyber bullying is a gender-specific behavior. Wong et.al (2018) found that both cyberbullying victimization and perceived online disinhibiting enhance the intention to perpetrate cyberbullying. But the factors influencing cyberbullying differ in strength for male and female students. However, there was no significant difference between the proportions of male and female young adults who reported being cyberbullied.

4. Research Methods

This study used a cross-sectional study design, carried out in 2021. We assessed demographic information, ICT use, students' perceptions of the motivations for cyberbullying, the cyber-victim's emotions, and reactions. The sample for this study was obtained through the online survey in Thailand. An online survey questionnaire was sent to university students aged 17-25 years, with a final 18.4% response rate (n = 388). Students received an invitation to participate in the survey. One of the limitations of using an online survey is the potential low response rate (Dillman, 2007). However, due to the sheer number of the population, it was the most cost-efficient choice. The final sample size is more than enough large for a study of this magnitude with 95% confidence level. The sample consisted of 184 females (47.42%) and 204 males (52.58%), aged 17 to 25 years. The mean age was 20.73 years (SD = 2.14).

5. Results

We first examined the extent to which students experience cyberbullying in order to gain a basic understanding of the issue. Overall, close to 62 percent of the students were cyberbully victims. Over 48 percent of the students had cyberbullied the others. In addition, 65 percent of the students reported that they knew someone being cyberbullied. When male and female students' experiences were considered separately, it was found that over 26 percent of males and close to 24 percent of females were cyberbullying. However, 42 percent of males and 39 percent of females reported that they were cyberbullied. Table 1 provides details of male and female students reported experiences.

Table 1: Percentages of student experiences of cyberbullying

	Male	Female
Cyberbully	26.3	23.9
Cyberbully victim	42.2	39.3
Aware of cyberbullying	57.2	55.6

n = 388

5.1 Do male and female adolescents have different cyberbullying experiences?

According to a chi-square test of independence, there was no significant difference between the proportions of male and female young adults who reported cyberbullying ($\chi^2 = 13.01, p < .05$). However, as can be seen in Table 1, more males (26.3%) reported cyberbullying on a social media site than females (23.9%).

Additionally, there was no significant difference between the proportions of male and female young adults who reported being cyberbullied ($\chi^2 = 12.83, p < .05$). However, as can be seen in Table 1, more males (42.2%) reported being bullied on a social media site than females (41.3%).

5.2 Students' perceptions of the motivation for cyberbullying

Frequencies were run to gain percentages for the data. "non-confrontational" (49%) had the largest percentage of perceived motivation while "target was different" had the lowest percentage (24%). These results can be seen in Table 2.

Table 2: Motivation for Cyberbullying

Motivation for Cyberbullying	Percent
non-confrontational	49
no consequences	32
target was different	24

Gender Differences of Motivation for Cyberbullying

Responses regarding a specific motivation to cyberbullying ranged from 1 (very untrue of me) to 5 (very true of me). Results of the independent samples t-test show that mean scores of "non-confrontational" differ between females (mean = 2.85, SD = .89) and males (mean = 2.41, SD = .57) at the .05 level of significance [$t(386) = 2.18, df = 386, p = .05, 95\% \text{ CI for mean difference: } -.18 \text{ to } .27$]. On average, females tend to perceive "non-confrontational" as motivation to cyberbullying more than males.

Table 3: Independent samples t-test comparing gender on "non-confrontational" motivation to cyberbullying

	Gender						t	df
	Male			Female				
	Mean	SD	n	Mean	SD	n		
non-confrontational	2.41	.57	204	2.85	.89	184	2.18*	386

* $p < .05$

5.3 Students' perceptions of the cyber-victim's emotions

Many victims of cyberbullying will get angry about what is happening to them. In fact, research indicates that anger is the most common response to cyberbullying followed by being anxious. When

cyberbullying occurs, the nasty posts, messages, or texts can be shared with multitudes of people. The sheer volume of people that know about the bullying can lead to intense feelings of humiliation. Cyberbullying sometimes causes students to be excluded at university. Consequently, they often feel alone and isolated. Victims of cyberbullying often find it difficult to feel safe. They may feel vulnerable and powerless.

Frequencies were run to gain percentages for the data. Anxiety (30%) had the largest percentage of perceived emotions of cyber-victims while isolation had the lowest percentage (15%). These results can be seen in Table 4.

Table 4: Cyber-victim's emotions

cyber-victim's emotions	Percent
Anger	27
Anxiety	30
Humiliation	21
Isolation	15
Powerlessness	17

The students have different perceptions of cyber-victim's emotions. The results of this study indicated that 30% of students perceived anxiety, 27% of students perceived anger, and so on. Isolation had the lowest percentage of 15%.

Gender Differences on Perception of Cyber-victim's Emotions

Responses regarding a specific emotion to cyberbullying ranged from 1 (very untrue of me) to 5 (very true of me). Results of the independent samples t-test show that mean scores of anxiety and powerlessness differ between males and females as shown in Table 5 and Table 6.

From Table 5, females (mean = 3.02, SD = .72) and males (mean = 2.81, SD = .71) differ at the .05 level of significance [$t(386) = 2.05$, $df = 386$, $p = .05$, 95% CI for mean difference: -.28 to .32]. On average, females tend to perceive anxiety emotion to cyberbullying more than males.

From Table 6, females (mean = 2.82, SD = .74) and males (mean = 3.15, SD = .93) differ at the .05 level of significance [$t(386) = 1.99$, $df = 386$, $p = .05$, 95% CI for mean difference: -.39 to .38]. On average, males tend to perceive emotion of powerlessness to cyberbullying more than females.

Table 5: Independent samples t-test comparing gender on anxiety to cyberbullying

	Gender						t	df
	Male			Female				
	Mean	SD	n	Mean	SD	n		
Anxiety	2.81	.71	204	3.02	0.72	184	2.05*	386

* $p < .05$

Table 6: Independent samples t-test comparing gender on powerlessness to cyberbullying

	Gender						t	df
	Male			Female				
	Mean	SD	n	Mean	SD	n		
Powerlessness	3.15	.93	204	2.82	.74	184	1.99*	386

*p < .05

5.4 Students' perceptions of the cyber-victim's reactions

Responses regarding a specific reaction to cyberbullying ranged from 1 (very untrue of me) to 5 (very true of me). Results of the independent samples t-test show that mean scores of avoidance differ between males and females as shown in Table 7.

From Table 7, females (mean = 3.04, SD = 0.66) and males (mean = 2.71, SD = .62) at the .05 level of significance [$t(386) = 2.24$, $df = 386$, $p = .05$, 95% CI for mean difference: -.24 to .36]. On average, females tend to perceive avoidance reaction to cyberbullying more than males.

Table 7: Independent samples t-test comparing gender on avoidance to cyberbullying

	Gender						t	df
	Male			Female				
	Mean	SD	n	Mean	SD	n		
Avoidance	2.71	.62	204	3.04	0.66	184	2.24*	386

*p < .05

6. Discussion of the Findings

There is no difference between the proportions of male and female university students' reporting both cyberbullying the others or being a victim of cyberbullying. More males reported being cyberbullying and being a victim of cyberbullying compared to females, which is similar to the results found by Kasahara et. al (2019). However, Li (2006) reported differently that males were more likely to be cyberbullies than their female counterparts.

From the finding, this study concludes that "non-confrontational" is the perceived motivation with the highest percentage. In addition, the motivations for cyberbullying statistically varies across genders. Female perceived "non-confrontational" as cyberbullying motivation more than males. This finding is consistent with the other research's findings that the most important characteristic of electronic bullying that appeals to cyberbullies is the anonymity and the low probability of detection and punishment (Kasahara et.al, 2019).

This study found that mean scores of anxiety and powerlessness differ between males and females. Females tend to perceive anxiety emotion to cyberbullying more than males; while males tend to perceive emotion of powerlessness to cyberbullying more than females. These findings are consistent with other research findings that cyberbullying causes emotional and physiological damage to defenseless victims (Akbulut and Eristi, 2011). Beebe (2010) found that the overall presence of cyberbullying victimization among undergraduate college students was found to be significantly related to the experience of anxiety, depression, substance abuse, low self-esteem, interpersonal problems, family tensions and academic underperformance (Beebe, 2010).

Aiming to determine perceived reactions by cyber victims, this study concludes that the avoidance reaction against cyberbullying varies at a statistically significant level across genders. It is perceived that female victims employ avoidance reaction against cyberbullying more often than males. The findings of other studies also conclude that males and females demonstrate different reactions to cyberbullying, and gender is a critical antecedent of behavioral reactions (Wong et al. 2018).

7. Recommendations

This paper demonstrates the perception of university students on cyber bullying in Thailand. The results of this study can be used to make recommendations to institutions to prevent cyberbullying and its consequences for adolescents. To reduce cyberbullying, it is important to avoid attribution of blame and focus more on prevention. The study and the possibility to understand the phenomenon should guarantee its inclusion in the education of young people. There should be the promotion of collaboration between family, university, and territory to counter the spread of cyberbullying and to provide socio-educational tools for parents, teachers and students; implementing communication and confidence among youths and adults and developing new space to train parents and teachers in recognizing cyberbullying.

8. References

- Akbulut, Y. and Eristi, B. (2011). Cyberbullying and Victimization among Turkish University Students. *The Australasian Journal of Educational Technology (AJET)*. 27 (7), 1155-1170.
- Akcil, S. (2018). *Cyberbullying-Victimization, Acculturative Stress, and Depression Among International College Students*. Doctoral dissertation. Kent State University.
- Beran, T., Rinaldi, C., Bickham, D. and Rich, M. (2012). Evidence for the need to support adolescents dealing with harassment and cyber-harassment: Prevalence, progression, and impact. *School Psychology International*, 33(5), 562-576.
- Boonoon, J. (2009), December 2. *Cyber bullying problem for Thai kids*. The Nation.
- Burton, P. and Mutongwizo, T. (2009). *Inescapable violence: Cyber bullying and electronic violence against young people in South Africa*. From <https://www.researchgate.net/publication/317226235>.
- Cao, B. & Lin, W.Y. (2015). How do victims react to cyberbullying on social networking sites? The influence of previous cyberbullying victimization experiences. *Computers in Human Behavior* (52), 458-465.

- Dillman, D. (2007). *Mail and Internet surveys: A tailored design method*. Hoboken, NJ: John Wiley & Sons, Inc.
- Elledge, C.L. (2013). Individual and contextual predictors of cyberbullying: The influence of children's victim attitudes and teachers' ability to intervene. *Journal of Youth and Adolescence*. 42(5), 698-710.
- Eristi, Bahadır. (2019). Reactions Victims Display against Cyberbullying: A Cross-cultural Comparison. *International Journal of Contemporary Educational Research*. 6(2), 426-437.
- Faryadi, Q., 2011. Cyberbullying and Academic Performance. *International Journal of Computer Engineering Research*. 1(1), 2250-3005.
- Hinduja, S. & Patchin, J.W. (2011). Cyberbullying: A review of the legal issues facing educators. *Preventing School Failure: Alternative Education for Children and Youth*, 55(2), 71-78.
- Kasahara, G., Houlihan, D. & Estrada, C. (2019). Gender Differences in Social Media Use and Cyber Bullying in Belize: A Preliminary Report. *International Journal of Psychological Studies*, 11(2), 32-41.
- König, A., Gollwitzer, M., & Steffgen, G. (2010). Cyberbullying as an act of revenge? *Journal of Psychologists and Counsellors in Schools*. 20(1), 210-224.
- Li, Qing. (2006). Cyberbullying in Schools A Research of Gender Differences. *SAGE Publications*, 27(2): 157–170. DOI: 10.1177/0143034306064547
- Mason K. L. (2018). Cyberbullying: A preliminary assessment for school personnel. *Psych in the Schools*. 45(4), 323-48.
- Molluzzo, J. and Lawler, J. (2012). A Study of the Perceptions of College Students on Cyberbullying. *Journal of Information Systems Education*. 10(4), 374-390.
- Rivers, I. and Noret, N. (2010). Participant Roles in Bullying Behavior and Their Association with Thoughts of Ending One's Life Crisis. *The Journal of Crisis Intervention and Suicide Prevention*. 31(3), 143-8. DOI:10.1027/0227-5910/a000020
- Ruthaychonnee S. and Smith, P. (2018). Bullying and Cyberbullying in Thailand: Coping Strategies and Relation to Age, Gender, Religion and Victim Status. *Journal of New Approaches in Educational Research*. 7(1), 24-30. DOI <https://doi.org/10.7821/naer.2018.1.254>
- Safaria, T., Tentama, F., & Suyono, H. (2016). Cyber bully, cyber victim, and forgiveness among Indonesian high school students. *The Turkish Online Journal of Educational Technology*. 15(1), 40-48.
- Songsiri, N., & Musikaphan, W. (2011). Cyber-bullying among secondary and vocational students in Bangkok. *Journal of Population and Social Studies*, 19(2), 235-242.
- Sourander, A., et al. (2010). Psycho-social risk factors associated with cyber bullying among adolescents: a population-based study. *Archives of General Psychiatry*. 67(7), 720-728.
- Thailand's National Report. (2020). *Child Online Safety Index (COSI) Child Online Safety Concerns - Childline Thailand*. From <https://childlinethailand.org>
- Thailand Internet User Behavior. (2020). *Electronic Transactions Development Agency (ETDA)*. Retrieved June 24, 2019. From <https://www.eta.or.th/th/Useful-Resource/documents-for-download.aspx>

Using Digital Intelligence to Fight Against Cyberbullying June 06, 2020. From

https://www.ais.th/networkforthais/content/en/content_01.html

Unintentional & Intentional Cyberbullying. Retrieved on August 2021. From <https://citalks.com/unintentional-intentional-cyberbullying/>

Wong, R.Y.M., Cheung, C.M.K., & Xiao, B. (2018). Does gender matter in cyber bullying perpetration? An empirical investigation. *Computers in Human Behavior* 79, 247-25.

Yehuda Peled. (2019). *Cyberbullying and Its Influence on Academic, Social, and Emotional Development of Undergraduate Students*. Heliyon e01393. Doi: 10.1016/j.heliyon.2019. e01393. From <https://doi.org/10.1016/j.heliyon.2019.e01393>

THE DEVELOPMENT OF SAWANGDAENDIN TECHNOLOGICAL COLLEGE BASED ON VOCATIONAL EDUCATION STANDARDS USING PROFESSIONAL LEARNING COMMUNITY PROCESS

Waraporn Boonson

Ph.D. (Educational Administration),

Faculty of Education, Sakon Nakhon Rajabhat University

E-mail: Warapornboonson27@gmail.com

ABSTRACT

The purposes of this research were to 1) examine the components of building a professional learning community based on vocational education standards, 2) investigate conditions, problems, and needs, 3) establish the development guidelines, and 4) examine the effects after the development of Sawangdaendin Technological College based on vocational education standards using a process for building a professional learning community. The co-researchers consisted of a researcher and 38 co-researchers, including a school director, 37 of teacher. A four-step, two-spiral participatory action research was conducted, comprising planning, action, observation, and reflection. Research tools consisted of a set of questionnaires, evaluation forms, observation forms and interview forms.

The findings were as follows:

1. The components for building a professional learning community (PLC) based on vocational education standards consisted of two parts: 1) vocational education standards included: graduates' desirable characteristics, vocational education management, building a learning society; and 2) The components of PLC involved: learning together and teamwork, participative leadership, shared vision, values, and norms, knowledge sharing in the workplace, continuous learning and professional development, and supportive structures for PLC.
2. The conditions, problems and needs for development revealed that the development conditions had unclearly defined development guidelines, and an ONESQA's quality assessment result indicated a need for quality improvement. Some teachers possessed limited knowledge of job development, employed conventional teaching and learning techniques, possessed limited skills in technology and media abilities, and were resistant to changes. In addition, problems were identified regarding teachers having a limited understanding of job development in relation to adhering to set vocational education standards, opportunities of continuous professional development, and were less ambitious regarding cultivating morality and ethics for themselves and their learners. The needs for job development based on vocational education standards were also matched with the previously mentioned components.
3. The development guidelines based on vocational education standards using a process for building PLC consisted of nine projects with 22 activities.

4. The effects after the college development based on vocational education standards revealed that:

4.1 Each standard and component of the college operations achieved a high level of satisfaction.

In the first spiral, the first standard on building a learning society and the first component on learning together and teamwork were identified as needing improvement. In the second spiral, the progress development compared to the first spiral reached 92.40 and 93.60, respectively.

4.2 Based on the overall development results, all concerned parties were aware of and gave importance to systematic management, and knowledge sharing. As a result, the college quality improved and met the standards set. Teachers designed instructional management that stimulated learner development in various aspects, and students demonstrated desirable characteristics. All parties were more involved in college activities. Parents, communities, and workplaces reported their satisfactory and increasing participation in college activities.

Keywords: Vocational Education Standards, Professional Learning Community

1. Introduction

Education is an important tool for human, society, and nation-building, and a major mechanic for developing the qualities to learn to live together happily and to keep up with changes in the 21st century. Inevitably, Thai education institution has followed up on such educational changes and formulated feasible policies and standards in line with The National Education Act of B.E. 2542, amended in B.E. 2545 and B.E. 2553, addressing the importance of education reforms in various aspects, namely education system, learning, administration and management system, and established educational management guidelines to enhance collaboration with individuals, families, communities, workplaces and other social institutions. In other words, educational institutions have changed from conventional administration models and educational management to foster development opportunities through stakeholders' participation. In addition, in the case of Sawangdaendin Technological College, the heart of educational development is to develop the quality of students based on national education standards and following vocational education standards (Office of the Vocational Education Commission, 2017, pp. 9-11). As Fullan (2006, p. 113) pinpointed that schools need to build a new culture to connect the focus of curriculum, teaching and learning management, evaluation, learning, and understanding to improve professional performance leading to the greatest success of education.

Sawangdaendin Technological College is a private educational institution in a vocation education system under the Office of the Vocational Education Commission, Ministry of Education proposing guidelines for developing institutions through the participation of all personnel within an organization. The development plans of Sawangdaendin Technological College (2020, p. 48) outlined visions aiming for promoting commitment in educational management, producing, and developing personnel to suit the needs of the workforce market and meet the quality of vocational standards, and improving potential in working and being good persons of societies. To achieve the institution' goals, students must have knowledge and skills in the profession, morals and ethics based on vocational education standards. Teachers and personnel should have opportunities and received teacher

training to perform duties effectively. They also should have a moral code of ethics of the profession, build a good relationship with communities, participate in various important activities, and provide services to communities, and develop effectively and stay up to date with information technology.

The research will establish knowledge to motivate development of education quality of student for commitment to excellence. The result establish learner satisfaction, parents and stakeholders by using participatory operational research process.

2. Research objectives

The objectives of this research were four mains as follows:

1. To determine the components of building a professional learning community based on vocational education standards,
2. To investigate conditions, problems, and needs for developing Sawangdaendin Technological College based on vocational education standards through the process of building a professional learning community
3. To establish guidelines for developing Sawangdaendin Technological College based on vocational education standards through the process of building a professional learning community
4. To examine the effects after the development of Sawangdaendin Technological College based on vocational education standards using the process for building a professional learning community.

3. Literature reviews

The development of vocational education institutions based on vocational education standards using the process for building a professional learning community was derived from the framework of vocational standards, principles of national education management, National Education Act B.E. 2542, National Education Plans B.E. 2560-2579, Educational management of Ministry of Education and Vocational Education Development Plan B.E. 2560-2579, and vocational education standards (Office of the Vocational Education Commission, 2017 p. 31). To manage vocational education to be in line with the Ministry of Education and Vocational Education Act, educational institutions must have an internal quality assurance within institutions to improve quality educational management, educational standards, and external quality assurance based on vocational education standards, and to follow the guidelines for developing or upgrading education quality. Sarojn Kojuantiaiw (2014, p. 207) pointed out that a completed cycle of quality assurance should cover set planning in accordance with the operations consisting of monitoring and following up, auditing, and operating performance according to the quality assurance of institutions based on vocational education standards.

According to Choochart Phuangsomjit (2017, p. 34) , the application of professional learning community (PLC) guidelines into practices in educational institutions, could be organized through teacher training by creating an atmosphere that teachers are able to share and learn together. This would create a working network for developing students' learning and development. In this vein, Woralak Chookamnerd and others

(2014, p. 125) noted that a professional team learning can stimulate professional development, and a support system based on job learning through work, could create learning for culture change built on authentic tasks, and then be continuously developed until becoming the normal habit of organization.

In conclusion, with reference to the objectives of education in the vocational education institutions, the effective development strategies to improve quality of human resources need to be also carefully prepared, designed, and continuously developed by stakeholders. The integration of professional learning communities into practices would point in creating the right direction strengthening vocational education for providing opportunities for quality professional learning of stakeholders to engage in students' preparation for technological advances and global competition.

4. Research methodology

The section presents the research methodology, including research design, participants, instruments, and data analysis. The research framework is also included.

4.1 Research design

The participatory action research was employed and aimed to develop Sawangdaendin Technological College based on vocational education standards through the process of building a professional learning community.

4.2 Participants

The co-researchers consisted of a researcher, 38 co-researchers, including a school director, 37 of teachers, educators, and members of institution board, and 27 key informants, including three administrators, six heads of programs, and 18 student representatives, one student representative from each class, total 56 people.

4.3 Research framework

The research drew the concept of the framework from the process for developing Sawangdaendin Technological College based on vocational education standards through a professional learning community using two-spiral Participatory Action Research was also implemented. The six development methods and the effects after the implementation were described.

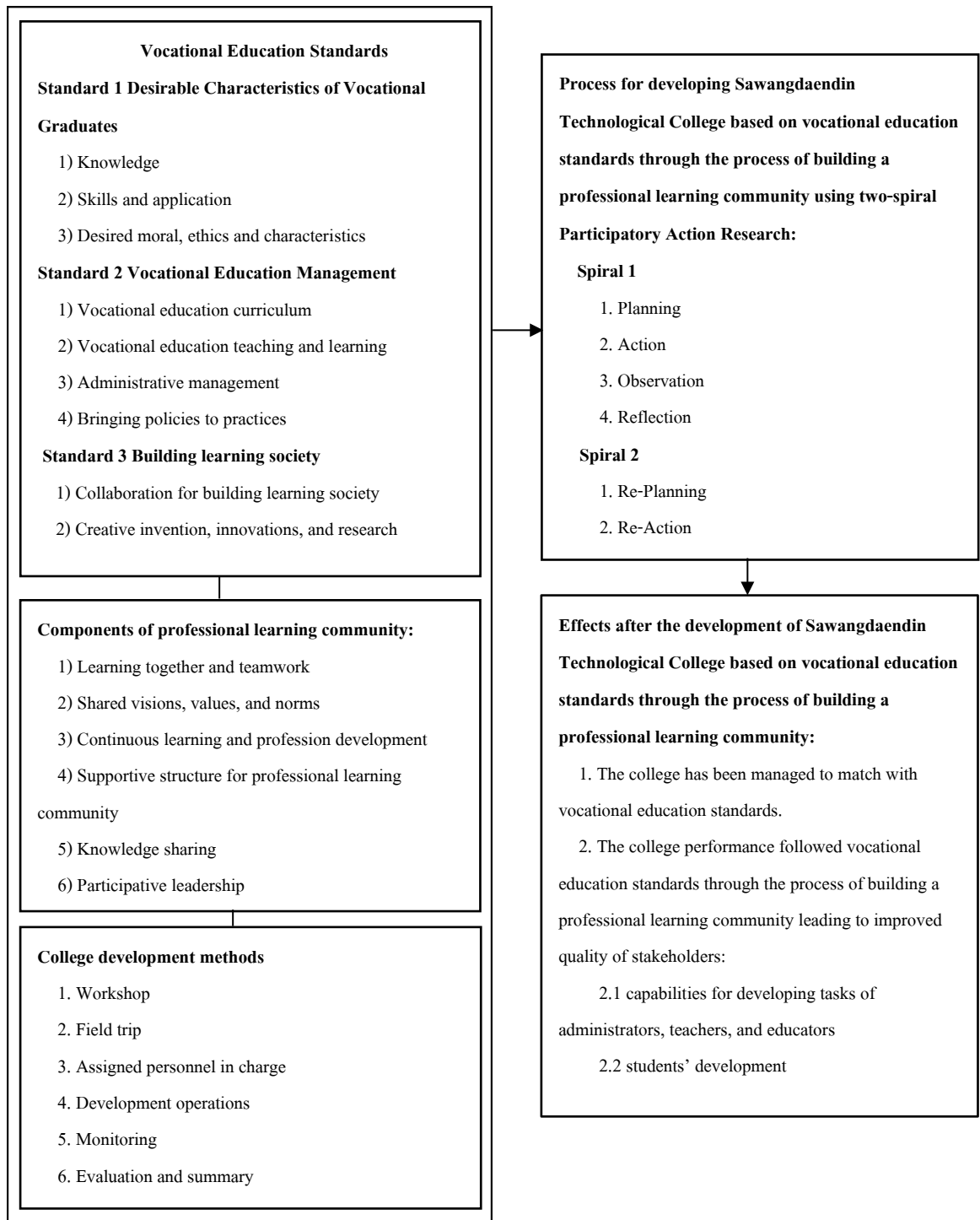


Figure 1 Research framework

4.4 Research instruments

Research tools consisted of 4 set are as follow 1) questionnaires on conditions and needs for developing Sawangdaendin Technological College based on vocational education standards through the process of building a professional learning community, 2) an assessment form, 3) an observation form, and 4) an interview form, total 38 for each.

4.5 Data collection

The researcher jointly observed, monitored and evaluated activities with key informants and co-researchers through the participatory action research using all designed research tools. In addition, the researcher used in- depth interviews for a target group to derive detailed information, confirmed the findings and discriminated the halo effects or information misinterpretation. It is cautions about the behavior by avoiding language expression. Improper poster or signify ordering bot using and open mind without sticking to a traditional bureaucratic culture that aims to create a fixed likeness or pattern. The research followed principles, code of conduct and roles of the researcher in line with PAR methodology.

Data analysis was divided into three stages as follows:

4.6.1 Qualitative data analysis was done through various collected data methods, such as participatory observation, in-depth interviews, workshop, etc., The data was then interpreted to reach a conclusion based on principles of inductive logic to describe meaning, relationship, and effects of perceived phenomenon and happenings as well as an analysis of the researcher's experience.

4.6.2 Quantitative data analysis examining characteristics of a target group and studied variables was conducted through a set of questionnaires, an evaluation form, an interview form. The researcher analyzed data using basic statistics, such as percentage, mean, standard deviation, etc.

4.6.3 Summary of data analysis. The researcher analyzed and synthesized data to evaluate the development and conclude the findings and discussion.

5. Findings

The research findings were as followed:

1. The components for building professional learning community (PLC) based on vocational education standards consisted of two parts: 1) vocational education standards included: 1.1) graduates' desired characteristics, 1.2) vocational education management, 1.3) building a learning society, and 2) The components of PLC involved: 2.1) learning together and teamwork, 2.2) participative leadership, 2.3) shared vision, values, and norms, 2.4) knowledge sharing in the workplace, 2.5) continuous learning and professional development, and 2.6) supportive structures for PLC.

2. The conditions, problems and needs for development were as followed:

2.1 The development conditions had unclearly defined development guidelines, and an ONESQA's quality assessment result indicated a need for quality improvement. Some teachers possessed limited knowledge

of job development, employed conventional teaching and learning techniques, possessed limited skills in technology and media abilities and were resistant to changes.

2.2 Problems were identified regarding teachers having a limited understanding of job development in relation to adhering to set vocational education standards, opportunities of continuous professional development, and were less ambitious in regard to cultivating morality and ethics for themselves and their learners.

2.3 The needs for job development based on vocational education standards consisted of two parts: 1) vocational education standards included: 1.1) building a learning society, 1.2) graduates' desired characteristics, and 1.3) vocational education management. and 2) PLC components comprised: 2.1) learning together and teamwork, 2.2) shared vision, values, and norms, 2.3) knowledge sharing in the workplace, 2.4) a supportive structure for PLC, 2.5) continuous learning and professional development, and 6) participative leadership.

3. The development guidelines based on vocational education standards using a process for building PLC consisted of nine projects with 22 activities.

4. The effects after the college development based on vocational education standards revealed that:

4.1 Each standard and component of the college operations achieved at a high level of satisfaction. In the first spiral, the first standard on building a learning society and the first component on learning together and teamwork were identified as needing improvement. In the second spiral, the progress development compared to the first spiral reached 92.40 and 93.60, respectively.

4.2 Based on the overall development results, all concerned parties were aware of, and gave importance, to systematic management and knowledge sharing. As a result, the college quality improved and met the standards set. Teachers designed instructional management that stimulated learner development in various aspects, and students demonstrated desirable characteristics. All parties were more involved in college activities. Parents, communities, and workplaces reported their satisfaction and increasing participation in college activities.

6. Discussion

The development of Sawaengdaendin Technology College in line with vocational education standards through the process of building a professional learning community was done through three standards and six components. The findings revealed that a mean score as a whole was at a high level, but Standard 1 Building learning society and Component 1 shared learning and teamwork needing improvement in the second spiral. The results of the second spiral compared to the first spiral showed that Standard 1 achieved a very good level with the progress from the first spiral at 92.40 percent, and Component 1 reached a very good level with the progress at 93.60. This could be explained that administrators, teachers, and educators were aware of the importance of college development based on vocational education standards. The development of teacher competencies for learning management in 21st century.

As a result, the development of the college led to systematic administrative management of the college, the application of competency curriculum focusing on learner centered content that could keep pace with technological changes, workforce market, and in accordance with learners' needs. The educational institution became a learning organization that was fully equipped with an effective environment, learning resources, media and technology through administrators and teachers' collaboration with an emphasis on developing students' desirable characteristics be in accord with Quality Learning Foundation (2013, p. 1) said gathering of teachers for learning management together to share a goal for better learning outcome, to affect teacher to be better, happier, and more advanced. PLC is mechanism and process of teacher for establish, use and apply knowledge to mastery learning, including adjust teacher became a learning facilitator or a coach, adjust classroom to learning room, individual learning to team learning, competitive learning to cooperation learning. Teacher transformed from lectures to inspirational, creating fun challenges in learning for student.

According to the research of Saroja Kojuantiaiw (2015, abstract) show that 4 aspects of quality assurance management of technical college consisted of organizational environment, input process, management process and learning outcome.

7. Recommendation

Regarding how to promote the current implementation framework in other educational institutions, a few recommendations can be made: The development of Sawaengdaendin Technology College was based on vocational education standards and procedures of building a professional learning community. As can be seen, vocational education institutions are paying much attention to the improvement of learners' quality, therefore the proposed implementation of the framework could impact an institutions' quality improvement.

Furthermore, there are recommendations for the system level and institutional level for developing the college by taking into account changes and continuously developing new knowledge. Teachers are also aware of personal development, sharing learning, support teachers taking part in task development, inspiring teachers, received new ideas, and organizing learning management using teaching media effectively based on vocational education standards through the process of building professional learning communities.

In addition, the proposed guidelines for developing Sawaengdaendin Technology College in line with vocational education standards through the process of building professional learning consisted of nine projects, 22 activities that interested educational institutions can further implement to develop educational institutions effectively.

Based on the fact that this present research recommends further studies that can point out the development of educational institutions based on vocational education standards through the process of building professional communities covering all components by focusing on the participation of stakeholders and all sectors related to education management. Apart from that, Research and Development (R&D) is recommended for further studies to draw principles, concepts for developing educational institutions based on vocational education standards through the process of building professional learning communities.

8. Acknowledgement

I am grateful to Asst. Prof. Dr. Watana Suwannatrai, Assoc. Prof. Dr. Chaiya Pawabutra, and lecturers from the Faculty of Education of Sakon Nakhon Rajabhat University, for their wisdom, encouragement, and insight. I also appreciate the support from administrators and teachers of Sawangdaendin Technology College.

9. References

- Choochat Phuangsomjit. (2017). Establishing School-Community Relationships. *Veridian E-Journal University*, 10(2), 1342-1354.
- Fullan, M. (2006). The Future of Educational Change: System Thinkers in Action. *Journal of Educational Change*, 7, 113-122.
- National Education Act B.E. 2542, amended B.E. 2454, B.E. 2554 and B.E. 2553. *Education Standards and Quality Assurance*. [Online] Retrieved 8 April 2021 from <https://www.sl.ac.th/addons/qa/9.pdf>
- Office of Vocational Education Commission. (2017). *Vocational Education Development Plan B.E. 2017*. Bangkok: Office of Vocational Education Commission
- Quality Learning Foundation. (2014). *Upgrading the quality of Thai teachers in the 21st century*. Bangkok: Quality Learning Foundation.
- Sarojn Kojuantaw. (2014). *The Strategies on Management of the Quality Assurance in Technical Colleges under Office of the Vocational Education Commission*. Doctoral Dissertation. Bangkok: Sripatum University.
- Sawangdaendin Technological College. (2020). *Education Development Plans*. Sakon Nakhon: Sawangdaendin Technology College Press.
- Woralak Choolamnerd and others (2014). *A Model of a professional Learning Community of Teachers Toward 21st Century Learning of School in Thailand*. Doctoral Dissertation. Songkla: Prince of Songkla University

MEDICAL TOURISM: A CASE STUDY OF COSMETIC SURGERY PACKAGES OF THAI TOURISTS IN KOREA

Sirada Jattuchai, Natnaree Apisitmontree, Rittikorn

Pitakchinnapong, Dararat Simpattanawong

Kasetsart Integrated Tourism Management,

Department of Tourism and Hospitality Industry,

Faculty of Humanities, Kasetsart University

Email: sirada.jat@ku.th

ABSTRACT

Medical tourism refers to visitors who travel to other countries to receive medical care and services as part of pre-arranged medical packages. This assures that the cosmetic surgery is performed under the supervision of the clinic or hospital's experts. As a result, the purposes of this study were (1) explore the behaviors of Thai tourists consuming the cosmetic surgery package in Korea, (2) identify the tourists' motivations in purchasing the cosmetic surgery package, and (3) study marketing strategies used by the agencies. The qualitative research employed a semi-structured interview to collect data from six key informants: three service providers and three customers. The first group consisted of three service providers: a surgeon, a cosmetic surgery clinic owner, and an agency. Another group consisted of three ex-patients who had direct experience with the agency's cosmetic surgery services. The findings revealed, in terms of behavior, Thai tourists favored service and natural designs, according to the data. The clinics' and agencies' dependability and safety were critical for motivation. Finally, agencies used media provided by the Korean government and promotions as part of their persuasion techniques.

Keywords: Cosmetic Surgery Package, Korea, Medical tourism, Thai tourists

Introduction

Cosmetic surgery is one of the methods for boosting people's self-esteem. When it comes to cosmetic surgery, most tourists think of South Korea because it is the world's center, Niruttikulchai (2019). According to Li et al. (2020), South Korea has become known as a center for cosmetic surgery. Asian tourists are predicted to be in great demand in the country. Furthermore, cosmetic surgery that is both economical and of good quality has become Korea's new national identity. Furthermore, new techniques and equipment have been developed to increase customer confidence in cosmetic surgery. Cosmetic surgery is now widely practiced and acceptable in many countries throughout the world. One of the most essential benefits of cosmetic surgery is that it not only boosts confidence but also gives you a more natural look. More importantly, clients' desire to improve their appearance is a factor that influences their decision to undergo cosmetic surgery. This is due to the influence of

celebrities or other well-known persons both at home and abroad, particularly the Korean trend, Watcharinporn (2012).

Furthermore, the cosmetic surgery market has been expanding in recent years. This is attributable to the emergence of a new generation of customers who are more concerned with health and beauty, as well as the broadening of people's perspectives in Thai culture. Furthermore, the trend of cosmetic surgery performed by Korean specialist surgeons has grown in popularity, resulting in the establishment of an agency business that transports more Thai tourists to Korea for cosmetic surgery. The agency's job is to supply customers with complete information, as there are currently over 1,000 cosmetic surgery facilities in Seoul, according to MGR Online Manager (2019). As a result, with the current trend numerous Thai tourists preferred to undergo cosmetic surgery in Korea more than in Thailand. Therefore, the researchers would like to conduct research to explore (1) explore the behaviors of Thai tourists consuming the cosmetic surgery package in Korea, (2) identify the tourists' motivations in purchasing the cosmetic surgery package, and (3) study marketing strategies used by the agencies by interview with key informants who have firsthand experience with the services and those who provide them, such as a surgeon, an agency, and a clinic owner. Aside from focusing on the fact that there is another intriguing content that can guide the readers and create an opportunity in the future in the surgery tour package business.

Objectives

1. To explore the behaviors of Thai tourists consuming the cosmetic surgery package in Korea
2. To identify motivations of Thai tourists consuming cosmetic surgery package in Korea
3. To study marketing strategies employed by Thai agencies for promoting cosmetic surgery package in Korea

Literature Review

Behavior

- Social aspect

According to Tiemlom (2016), Thai visitors have chosen Korea as a cosmetic surgery destination because of the cultural features. He also adds that some qualities characterize Korean beauty standards, such as large and round eyes, a sharp but not overly large nose, and a V-Line facial shape. In terms of social criteria, meeting those beauty standards entails a greater social standing. It demonstrates that you have the financial means to live up to society's expectations. According to Patchimnan (2017), the elite appears to rely on surgery as a convenient method of treatment. The middle class is more likely to use their intelligence to keep their physical health under check through food and exercise. As a result, Thailand has seen an increase in cosmetic surgery tourism to Korea. Apart from specific human features, post-surgery images are crucial in persuading buyers. Tonoom (2018) demonstrates that the utilization of post-surgical photographs in Korea piques people's interest

in cosmetic surgery. Pre-surgery and post-surgery images are included, demonstrating the changes and abilities of Korean surgeons.

Motivation

- Reliable Service

Tiemlom (2016) states that she did some research on cosmetic surgery in Thailand and came across some unfavorable feedback. As a result, the participant decides to save her money and instead travel to Korea. Furthermore, customers' legal rights must be addressed as a potential risk to their preferences. In Thailand, the legal protections for customers undergoing cosmetic surgery are quite limited. Several medical practitioners in Thailand, according to Kanchanajan (2013), do not hold a medical license to do cosmetic procedures. As a result, buyers were not offered insurance or a guarantee in the event that the procedure proved to be defective. The findings support Watcharinporn's (2012) findings that the major motive for Thai customers is the service's reliability in Korea.

Holliday and Hwang (2012) explain why people choose to do cosmetic surgery. They claimed that national identity, globalization, and self-care are powerful motivators. Women in Asian countries are undergoing a process known as "Westernization," according to a globalization example. As a result, Western traits such as double eyes and light skin are adopted. In addition, the study looked into the popular perceptions of cosmetic surgery among Korean women. Unexpectedly, the findings reveal that 70% of women have no objections to cosmetic surgery and are willing to talk about it freely. As a result, Thai women may feel more at ease seeking cosmetic surgery in Korea.

The Theory of Reasoned Action explains why people choose to have cosmetic surgery (TRA). This hypothesis is utilized to explain customer behavior, resulting in excellent forecast accuracy. This theory was applied to cosmetic surgery behavior in Korea by Teng et al. (2019), who discovered some beneficial motivators. To begin with, the media and celebrities have sparked interest in undergoing surgery. Another issue is psychological aspects of self-esteem strengthening. Thai women with high standards of beauty and body dissatisfaction were more likely to undergo cosmetic surgery in Korea, according to the study. Many people feel compelled to conform to the social ideal of beauty when looking for a companion. Many ladies and males choose cosmetic surgery to enhance their youth and beauty in order to boost their mating possibilities.

Marketing Factors Affecting the Decision

- Advertisement

The popularity of doctors and institutions were the most effective marketing methods in attracting customers. Customers prefer South Korea to Thailand, according to Tonoom (2018), because of their well-known medical staff. Customers frequently examine reviews and feedback about a location before making decisions. Price and affordability, discounted packages, locations, and post-surgery care were all listed in the study as marketing elements. Furthermore, trip packages have proven to be a popular marketing tactic among Thai clients. In order to attract Thai customers, travel agencies in Thailand offer local tourist attractions, culture, gastronomy,

and shopping in South Korea, according to Kanchanajan (2013). Customers were convinced by this method while deciding whether to have cosmetic surgery in Thailand or South Korea.

- Government Policies

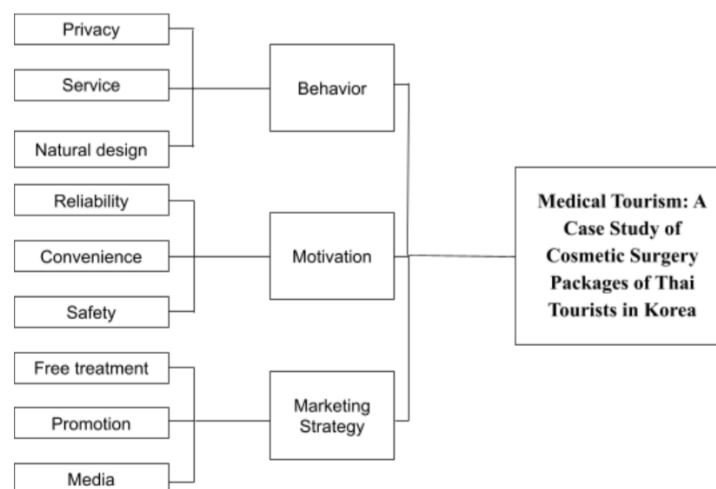
Another important marketing factor is Korea, the host country. Korean government sees this as an opportunity to bring the entertainment, beauty, and tourist industries together. The inspiration came from the popularity of the “K-Wave” in several countries (Siampukdee, 2017). In television shows, ads, and movies, the entertainment business employs a variety of products and cosmetics. As a result, viewers have been tempted to purchase things that make them seem like the primary actresses/actors they admired. In addition to connecting these three industries, the government pushed the use of IT platforms to promote Korean cosmetic surgery (Wong, 2018). For example, the IT platform provides online services to both new and existing customers. Customers can get information on the doctor, the hospital, and check for certificates of the surgery clinics they are interested in using this website. Furthermore, this service is offered in a variety of languages, and online personnel is available to answer any questions. Future and current clients can rest confident that they are in the hands of a qualified medical team who is backed up by the Korean government.

Research instruments

The semi-structured interview was used to collect data from the informants.

Methodology

A qualitative method was applied to offer a more exact explanation of Thai participants' viewpoints on the consumption of cosmetic surgery tour packages in Korea.



Key Informants

Six key informants were divided into two groups: service providers and customers consuming cosmetic surgery tour packages in Korea. The first group consisted of three service providers: a surgeon, a cosmetic surgery clinic owner, and an agency. Another group consisted of three ex-patients who had direct experience with the agency's cosmetic surgery services.

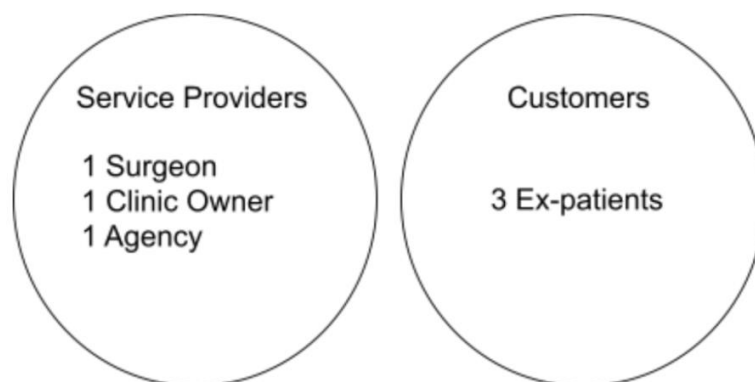
Data Collection and Analysis

Semi-structured interviews were applied to collect data from the six key informants. The key informants were separated into two groups: service providers and customers. In service providers a surgeon and a clinic owner were recruited by reputation and reliability in the Medical Council of Thailand, and an agency was selected by high experienced from reliable media. Moreover, customers were recruited which have directly experience from cosmetic surgery packages to collect the reliable data.

Questions were asked based on the participants' experience. The interview process was approximately 15 minutes for each key informant. The questions were related to cosmetic surgery experience for the participants who have purchased the cosmetic surgery tour packages.

For the service providers, the questions were related to attitudes and marketing strategies used to encourage people to purchase the packages.

In the findings, the obtained data gathered from the interviews was organized topically.



Findings

The results from the interviewees from both service providers and customers were divided into three parts; behaviors, motivations, and marketing strategies. Therefore, in this section of the article, selected quotes or conversations from key informants were used to narrate their experiences.

Behavior

Service provider 1	“If you ask me about plastic and cosmetic surgery, I believe Korea is the best for plastic and cosmetic surgeries. Cosmetic surgery is all about stitching, cutting, and sewing in which any surgeon could do. However, the key is the uniqueness of the natural design provided by Korean surgeons. Thai visitors desire to have a facial shape that resembles Koreans; thus, it is simple to perform surgery in Korea by the original Korean surgeons.”
Service provider 2	“A significant distinction between cosmetic surgery in Thailand and Korea is the level of privacy provided throughout the procedure. On the one hand, Koreans see cosmetic surgery as a sign of riches and respect for privacy; on the other hand, in Thailand, people would chatter if they saw someone with surgery sutures going outside.”
Ex-patient 1	“All we had to do was go to Korea, and the agency took care of everything else, including pre- and post-operative care. For example, symptoms were examined at several appointments following surgery not only while we were in Korea, but also when we came back to Thailand. The agency was still asking about symptoms after the procedure when we were in Thailand. “

The results obtained from the interviews of two sample groups, three key informants were quoted from the above. It can be concluded that Thais prefer to get cosmetic surgery in Korea for the following reasons: service, natural cosmetic surgery, and privacy, consistent with behavioral factors.

Key informant stated that agencies' service was the main factor affecting decision making to select the service in the tour package because the agencies will take care of all things in terms of documentation and pre and post operative care. After the procedure, the organization continues to contact to check on the customers if they require any assistance or if they are experiencing any adverse effects which is impressive for Thai tourists. In addition, the key informants stated that cosmetic surgery in Korea makes them more authentic and realistic at the point that it is not noticed that they have undergone surgery. This links to the behavioral factor driving the gravitation of Thais towards Korea surgery. Finally, the consumption of surgery tour packages for Thai tourists is a feeling of privacy and comfort provided after an operation in Korea. Because they will not be noticed by an acquaintance or be gossiped about their postoperative appearance and recovery, they can live their normal life and spend their time out in a stress-free way.

Motivation

Service Provider 1	“Our organization's dependability attracted customers. We didn't take several customers to Korea for cosmetic surgery at the same time unless they were traveling together. Because we had expertise taking care of three customers from various families, our working approach was that after we finished one case and it was completed, we would be given another case. It was difficult when we arrived at the restaurant because several customers were not friendly and likely desired privacy. The most important things for us to concentrate on are how we handled and motivated them to use our service, what service we offered them, and how we demonstrated what they would receive from us.”
Ex-patient 1	“Korea has advanced in cosmetic surgery, but there has been a lot of press in Thailand about patients dying from anesthesia. After my experience with cosmetic surgery in Korea, every clinic now employs an anesthesiologist, indicating that they are more worried about patient safety. If I ever get the opportunity to undergo cosmetic surgery again, I would choose to do so in Korea with the agency because they can take care of us and our lodging and travel fees are covered. Furthermore, the agency would provide a discount or a free service, which I believe is worth paying for.”
Ex-patient 2	“Overall, I believe the agency has certain flaws, such as the fact that not all prices were included in the package, and I had to pay for a hotel fee that should have been included in the package. In addition, I paid for practically everything on my own. The package cost around \$400,000, although it just included transportation from the airport to the hotel and an interpreter. Because I paid a lot of money to travel with them, I thought they should provide more services. In my opinion, if I go to Korea for cosmetic surgery again, I will use a different agency or locate an interpreter on my own to save money.”

According to the findings, it can be clearly identified that Thai tourists are motivated to consume cosmetic surgery tour packages through agencies by three main factors including reliability, convenience, and safety in which agencies will be a person who is taking care in every step in both pre- and post-operation to meet the expectation of customers which related to the motivation factor.

Both groups agreed that the following elements influenced Thai tourists' decision to have cosmetic surgery in Korea. Nonetheless, one of the customers said that the agency was not meeting her expectations in terms of service.

The service providers showed their dependability by demonstrating how professionally they could care for each of their customers during the pre- and post-surgery processes. Some customers may have had a positive experience with the agency, while others may not have because the agency delivered substandard service that they believe is not worth paying for.

Marketing Strategy

Service Provider 1	“Viewers of Korean dramas aspire to be as attractive as celebrities. As a result, many people undergo procedures, same as in the series, where everyone was forced to consume food or drink Soju due to government laws. They wanted to go eat since it's all about manufacturing in this country.”
Service Provider 2	“In the event that the buyer did not negotiate the price, we would offer free treatments, for example, Botox or face liposuction, as well as free lodging and transportation, but lodging and transportation are usually included in packages. We would take customers out to lunch and shop the day before their procedure. During the recovery period, we would administer a treatment to help reduce swelling on a daily basis till the day of your return. We would take customers on a walk on the third day following surgery, such as shopping around the city or transporting them to a distant area where they would have to take a boat across. Cosmetic surgery clinics in Thailand, on the other hand, would offer customers with drugs to take at home and follow-up on the seventh day after the surgery. Korean cosmetic surgery facilities, on the other hand, would check on the wound virtually every day.”
Ex-patient 1	“Getting cosmetic surgery through an agency was convenient since they looked after us from the moment, we boarded the aircraft. The rates vary for each agency. For those with high rates, they would provide a variety of benefits, such as free lodging for seven days or a 50% discount for seven days. When I went to do surgery with an agency, they gave three meals per day because I couldn't afford to go out and buy them on my own. They provided a day trip to travel about the city after I recovered, which was previously included in the package. As a result, the agency's strong suit is that everything will be taken care of at no cost.”

According to the findings, obviously seen from two groups of key informants, the marketing's aspects that influenced Thai tourists purchasing decision for a cosmetic surgery package in Korea were media, free treatment, and promotion.

In terms of marketing, a strategy to promote via social media is obvious. According to the service provider, Korean series were deployed to advertise and create impacts on Thai tourists in taking a cosmetic surgery package in Korea by presenting ideal looks of actors and actresses or products that were featured in the series. Another factor that led Thai tourists to take the surgery the agency's offers was an interesting promotion. Free treatments, accommodation and transportation as well as promotional discounts were offered to attract the customers in the competitive market.

Discussions**Behavior**

According to the findings of this research, it showed in terms of behavior, all key informants agreed that when it came to going to surgery in Korea, they valued comfort, privacy, and natural design. According to Tonoom (2018), the utilization of post-surgical photos appears to entice people interested in corrective surgery in Korea in order to develop options for consumed cosmetic surgery. These images demonstrate how much a

Korean expert can accomplish which were taken pre- and post-surgery. Furthermore, this relates to our findings, according to one key informant stating that Thai tourists prefer to have similar Korean face and it is also dependent on the technique whether who can make it look the most natural and made them feel satisfaction, thus, it is easy to perform surgery in Korea from the original Korean surgeons.

Motivation

The most significant incentive element for Thai tourists purchasing cosmetic surgery packages in Korea, according to this study, is that most Thai tourists rely on the agency since they provide comprehensive services. These services cater to the demands of customers by ensuring that they are well cared for throughout the entire procedure, including pre- and post-operative care as well as rehabilitation. Furthermore, according to the Tiemlorn (2016) participant, Thai tourists are probably to research cosmetic surgery in Thailand, but find some unfavorable evaluations, so they select to pay for the higher pricing and better reviews in order to achieve better results. Moreover, in reliability of agency and surgeons also important to Thai tourists for decision to use of cosmetic surgery, this relates to research of Kanchanajan (2013) and Watcharinporn's (2012) reveal that the major motive for Thai tourists is the service's reliability in Korea.

Marketing strategy

According to the findings, it shows in term of marketing strategy, key informants watch Korean dramas and strive to have the same attractive features as their favorite superstars. As a result, Korea uses a wide range of advertising media, including television shows. For example, promoting the cosmetics that the series' protagonists use, whether it's dietary supplements or modifying the shape of the face to allow the body's tide to flow. Additionally, providing food or shopping is an incentive for folks to have surgery. Through Korean entertainment media, Korean beauty products are gaining appeal and a reputation for tangible quality. This related to the research of the Siampukdee (2017), in television shows, ads, and movies, the entertainment business in Korea employs a marketing strategy way for a variety of products and cosmetics surgery. As a result, viewers have been followed to purchase things that make them seem like the favorite actresses/actors they admired.

Suggestions

The following are some ideas from the interviewees based on the research findings:

1. The results of this study may lead to raising awareness for those who are interested in undergoing cosmetic surgery. Korea may be a good option for them to have a surgery with the styles, the surgeon's expertise, and post-surgery services.

2. The agency was able to obtain the data from this research to better understand Thai tourists' perspectives to improve their service and marketing strategies for increasing more customers.

Despite the fact that this study made some useful contributions, future research could recruit more diverse individuals in each group to obtain more accurate data and gain a better understanding of Thai tourists' perspectives.

Acknowledgments

The researchers would like to express special gratitude to six interviewees who gave us attitudes and perspectives to support this research to collect data.

Finally, our completion of this research could not have been accomplished without Kasetsart Integrated Tourism Management and our advisor, Dr. Dararat Simpattanawong, who has been helpful in giving support at all times and helping us achieve our goals. This provides the researchers to gain new experiences and understand more about cosmetic surgery packages. The Researchers would like to give special thanks to all people who involve and cooperate with us in this research.

References

- Holliday, R. and Elfving-Hwang, J. (2012). Gender, Globalization and Aesthetic Surgery in South Korea. *Journal of Body & Society*, 18(2), 58-81.
- Kanchanajan, P. (2013). *Legal Measures of Consumer Protection: Case Study of Surgery Tour in the Republic of Korea*. Independent Study of the Master of Laws Program in Business Laws. Khon Kaen: Sripatum University Khon Kaen Campus.
- Li, E. P. H., Min, H. J., Lee, S. (2020). Soft power and national rebranding: The transformation of Korean national identity through cosmetic surgery tourism. *International Marketing Review*, 38(1), 141-162
- MGR Online Manager. (2019). "Jenkwon I." Reveals that Many Thai People Fly to Korea for Plastic Surgery and Recommend Studying More When Choosing a Professional Surgeon for Beauty in Your Own Style. [Online]. Retrieved July 31, 2021, from: <https://mgronline.com/business/detail/9620000048696>
- Nirutikulchai J. (2019). *The opportunity of Thailand to cooperate with South Korea in expanding the cosmetic surgery market*. [Online]. Retrieve September 16, 2021, from: https://www.ditp.go.th/ditp_web61/article_sub_view.php?filename=contents_attach/568603/568603.pdf&title=568603&cate=428&d=0
- Patchimnan, M. (2017). *Beauty Ideal through Transnational Media and Its Effects on Cosmetic Surgery*. Independent Study of the Degree of Bachelor of Communication Arts Program in Strategic Communication. Bangkok: University of the Thai Chamber of Commerce.
- Siampukdee, U. (2017). South Korea's Medical Tourism Strategy. *Thai Journal of East Asian Studies*, 20(2), 71-98.
- Teng, P. K., Seng, K. W., and Ling, T. J. (2019). Propensity to Undergo Cosmetic Surgery and Services in Seoul. *International Journal of Community Development and Management Studies*, 3, 001-016.
- Tiemlom, V. (2016). Aesthetic Surgery in South Korea, You Can order. *Journal of Integrated Sciences, Colleague of Interdisciplinary Studies. Thammasat University*, 13(2), 129-175.
- Tonoom, T. (2018). A study of Marketing Mix and Personal Affecting the Decision Case Study: Cosmetic Surgery. *The Proceedings of the 2nd UTCC National Conference*, 8 June 2018 at University of the Thai Chamber of Commerce, 150-160.

- Watcharinporn, S. (2012). *Marketing Factor to Decision Making Facial Cosmetic Surgery of Consumer in Bangkok Metropolis*. Independent Study of the Degree of Master of Business Administration Program in Marketing Management. Bangkok: Siam University.
- Wong, K. Y. J. (2018). No More Taboo: Discursive tactics for navigation the taboo of cosmetic surgery. *Journal of Global Media and China*, 3(4), 271-296.

SUPPORTING TEACHERS: THE TRANSFORMATION FROM CLASSROOM TEACHING TO ONLINE COACHING DURING THE COVID-19 PANDEMIC

Piboon Sukvijit Barr

Department of English for Business Communication/

School of Liberal Arts, Sripatum University

E-mail: piboon.su@spu.ac.th

Nika Sarmiento

Department of English for Business Communication/

School of Liberal Arts, Sripatum University

E-mail: nika.sa@spu.ac.th

Oscar Jr. Malicad

Department of English for Business Communication/

School of Liberal Arts, Sripatum University

E-mail: oscar.ma@spu.ac.th

ABSTRACT

Teachers are one of the most powerful factors in students' academic performance, especially during the COVID-19 pandemic. Now, the learning platform is online, it is necessary for teachers to transform their role from knowledge providers to coaches. This transformation is to ensure the nurturing learning environment, which is needed the most in the midst of this pandemic for students' academic success. Creating a supportive environment in the online classroom is certainly essential. Thus, this academic article will shed light on the importance of the language teacher role to students' successful academic performance and how they can be supported to become professional teachers in the digital age.

Keywords: Online Coaching, Neuroscience, Academic Performance, Students' Motivation

1. Introduction

Education during the Covid-19 pandemic heavily emphasizes teaching methodologies and instructional technology as can be seen in academic workshops, conferences, studies as part of professional development. However, very little evidence exists concerning the teacher as one of the crucial factors in the learning environments of the teaching and learning process. As stated by Usman (2016) that the teacher is the key factor

in creating a teaching and learning favorable environment which makes the teaching become fruitful. Prof Loh Sau Cheong, head of Educational Psychology and Counseling Department, Universiti Malaya (UM), said that “In some situations, students will even feel depressed and develop a feeling of helplessness. These will lead to a negative attitude towards learning and will affect the learners’ well-being in the long run.” He further states that it is important that teachers guide students to attain their own goals in their own way (Chonghui, 2020).

For teachers to be able to guide their students effectively, they need to be supported by giving them adequate training and skills needed, which will enable them to build rapport with their students, particularly, during the online learning method. In the Thai context, online learning has been challenging for many and even more stressful for both teachers and students across levels of education. In higher education, students struggle with online learning. As it seems, they lack learning resources, responsibility, self-regulation, motivation, and positive learning attitude. These qualities are prominent in the online learning contexts (Chiu & Hew, 2018).

Therefore, this article will shed light on the teacher factor, in particular, due to the fact that online learning will be fruitful only depending on teachers. Supporting teachers to transform themselves into coaches will facilitate students greatly as the coaching method of the teaching and learning process aims at inspiring students’ wisdom, stimulating their interest in learning, promoting learning autonomy and improving their learning ability and efficiency (Yu, Guo, & et.al., 2020). It will explore the impact of the Covid-19 pandemic on education, explore Thai students’ academic performance during the pandemic, investigate how being teachers as coaches can facilitate students’ academic performance and explain how to create effective and professional teachers as coaches in the digital age. This article attempts to enlighten educators and teachers that coach-type teaching methods can be a new role for all teachers.

2. Objectives

- (1) To explore the impact of Covid-19 on education.
- (2) To explain Thai students’ academic performance during the Covid-19 pandemic.
- (3) To investigate how being teachers as coaches can facilitate students’ academic performance during the Covid-19 pandemic.
- (4) To explain how to create effective and professional teachers and coaches in the digital age.

3. Online Learning during the Covid-19 Pandemic

The lockdown due to Covid-19 has created a massive disruption to our education system, resulting in a paradigm shift in the way educators deliver content. According to Subedi et al (2020) E-learning tools have played a crucial role during this pandemic, helping schools and universities facilitate student learning during their closure. Teachers and educational staff have also played a major role in response to this and have had to face a number of emerging demands during this crisis. Most educators have had to re-plan, design materials, adjust teaching and assessment methods, create pre-recorded videos, diversify media and online platforms, and become tech-savvy to adapt to digital teaching.

The effects of this shift from face-to-face to online learning are not only seen in educators and staff but also among students. With the strain of lockdown, combined with the pressure of completing schoolwork, students who are confined at home for long periods of time, feel more stressed and overwhelmed which undoubtedly affects how they approach learning. Petrie, (2020), states that several students at home/living space have undergone psychological and emotional distress and have been unable to engage productively. A similar report by Di Pietro et al (2020), illustrated the detrimental effects on students' learning through these four main channels. The report states that student learning is expected, on average, to suffer a setback. Despite the widespread move to online teaching, student progress will not simply be the same as if schools were open.

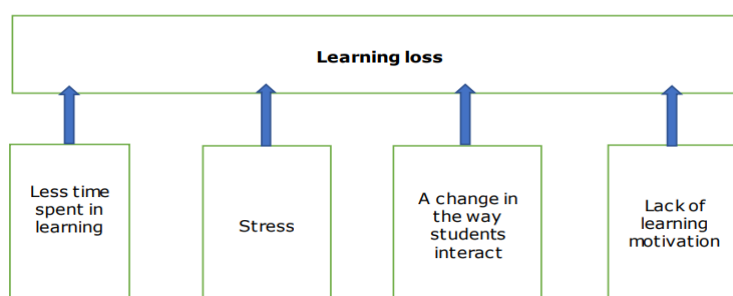


Illustration 1: The likely impact of COVID-19 on education: Reflections based on the existing literature 1 (Di Pietro et al, 2020)

With this in mind, it is worth noting that online education has also shown great potential due to its flexibility and convenience. However, something that is also crucial in online learning now, is not only the teacher's content knowledge of their subject but also the ability to create an engaging classroom environment online, to promote healthy and interactive teacher-student relations that could enhance learning. With our current situation, having good content knowledge may simply not be enough. Although there is no perfect one-size fits all approach to online learning, the phrase Maslow before Bloom is the common phrase used in educational circles (Pokhrel' & Chhetri, 2021). According to Maslow's theory of hierarchy of needs, a necessary condition for the development of higher needs is the fulfillment of the lower needs. In general, it can be defined as certainty, stability, support, care and freedom from fear, anxiety and chaos (Maslow, 1943). In order for online learning to be effective, this approach should be explored. For a student to strive educationally, they must first meet the lower needs such as a nutritious diet, stability, nurturing environment, and feel a sense of belonging.

4. Online Learning Experience of Thai Undergraduate Students

Evidently, online learning has been a major struggle and unpleasant experience for many Thai students. It is, in fact, a painful experience for a number of them to have to abruptly change the mode of learning and being out of their regular comfort zone without much support from both physical infrastructure and a nurturing environment. Ample reports both in the academic and social media settings have repeatedly revealed that Thai students in all levels of education have failed to implement effective online learning during the pandemic. Part of

the failure is that Thai education policy “does not fully address inequality among students, resulting in a lack of support to those who need help the most” (Wangkiat, BangkokPost, 2021). Teachers have been given too much workload and paper work of assessments that have to be filled out.

In Thai higher education, many studies of online learning have investigated students’ satisfaction, learning behaviors, and academic achievements. Most recent research results have revealed that the teacher is one of the crucial factors to have an impact on learners’ online learning behaviors, motivation, and performance (Hemkrasri, 2018; Lertsakornsiri, Narumitlert & Kitiya Samutpradit, 2021; Maneewongse, 2021). A research study conducted by Hemkrasri (2018) on the satisfaction of e-learning lessons of biology laboratory courses revealed that students were satisfied with learning performance and achievement at a high level. However, a study conducted by Lertsakornsiri and others (2021) on factors affecting learning behaviors with college students’ online learning from Covid-19 situations indicated that students’ learning behaviors were moderate while a study by Maneewongse (2021) revealed that students’ learning behaviors were positive and at a high level; however, students had difficulty understanding English subjects. These studies may yield different results; however, they suggest that an external factor, which is a teacher, is essential to teaching and learning. A good relationship, interaction and communication between teacher and students have been mentioned as important factors to students’ learning achievement and online learning behaviors. This can also be supported by a study conducted by Keawchan and Rattanapongpinyo (2021) which revealed that teacher factors, namely the quality and experience of the instructor, were most crucial in online learning.

According to the aforementioned studies, teachers are one of the most essential factors in the online learning of Thai students, especially for the ones that have poor learning performance. Switching from face-to-face to online learning requires a high degree of self-autonomy, self-discipline, self-regulation and motivation. A question arises here whether Thai students possess these qualities to be able to achieve their learning goals. Thai students need a nurturing learning environment. Hence, the role of teacher as a knowledge provider needs to be reconsidered. Perhaps, teachers as coaches can be an alternative role for online learning.

5. Teachers as Coaches: Alternative Role of Teachers for Online Learning

The role of the teacher-coach has become even more essential for online learning during the spread of the pandemic due to its essence of empathy, support, and motivation and nurturing. To better understand the term coaching, it is necessary to investigate its meaning. There are numerous definitions of the term as shown in Table 1.

Table 1: Definitions of Coaching

Authors	Definition
Parsloe (1995) cited in Paling (2013)	“Coaching is directly concerned with the immediate improvement of performance and development of skills by a form of tutoring or instruction”
International Coach Federation (2005) cited in Paling (2013)	“A professional partnership between a qualified coach and an individual or team that support the achievement of extraordinary results, based on goals set by the individual or team”
Paling (2013)	“An ongoing conversation between the coach and the coachee (face to face or by telephone/online) which assists the coachee to explore an aspect or aspects of the coachee’s life to enhance, improve, assist the coachee to achieve short- or long-term goals which the coachee has set as realistic targets.”
Cox, Bachkirova and Clutterbuck (2014, p. 1, cited in The Open University, 2016)	“ Coaching is a human development process that involves structured, focused interaction and the use of appropriate strategies, tools and techniques to promote desirable and sustainable change for the benefit of the coachee and potentially for other stakeholders.”
Whitmore (2017, cited in The Open University, 2016)	“Coaching is unlocking people’s potential to maximize their own performance. It is helping them to learn rather than teaching them.”
The Oxford Advanced Learner's Dictionary (2021)	“The process of training somebody to play a sport, to do a job better or to improve a skill.”
Cambridge University Press (2021)	“The act of giving special classes in sports, a school subject, or a work-related activity, especially to one person or a small group/”

Based on the definitions above, it can be summarized that coaching is a process of understanding, supporting and enabling others to achieve their goals. It’s a mutual process in which both the coach and coachee need to have trust and a growth mindset outlook in driving behaviors and actions to achieve a set goal or goals. Essential skills include asking questions, effective listening, and positive communication. For the coachee, coaching enhances their self- autonomy, self- determination, self-regulation, self-esteem and motivation. These qualities relate to the psychological perspective. According to Cherry (2021), self-determination and motivation can be fostered through positive feedback and adequate external rewards. Therefore, for online learning to be effective, teachers need to transform their role to coaches who truly understand learning psychology and have communication skills needed to enhance the aforementioned qualities.

To become a teacher-coach, one needs to understand the coaching process. Among many coaching models, there are prominent models found from various resources (Paling, 2013; Sutton, 2020; The Open University, 2020; Mindtools, 2021) which can be demonstrated in Table 2.

Table 2: Coaching models

The GROW Model (Whitmore, 1980) cited in Mindtools (2021)	CLEAR Coaching Model (Hawkins, 1980s)	The 5 C Model (Pegg, 1999) cited in OpenLearn	The OSKAR Model (McKergow & Jackson, 2002) cited in Mindtools (2021)	The 5 C's of Language Coaching (Paling, 2013)
Goal -Find out what one wants to change and set it as a goal	Contracting -Set ground rules for the coach and coachee to work together.	Challenges -an issue or problem the mentee is currently facing.	Outcome -Objective one wants to achieve.	Concrete requirements -Diagnosing the coachee's language ability
Current Reality -Identify one's current situation	Listening -Actively listen to the coach with empathy.	Choices -the options available to them for dealing with that issue or problem.	Scale -Measurement of how close one is to achieving the desired outcome	Clear targets and commitment -Coachee sets mechanical goals and mastery goals
Options (or Obstacles)-Explore possible options to reach the goal.	Exploring -Help the coach to understand his/her own situation and challenge them to think of possible actions.	Consequences -the consequences of choosing one option over another.	Know-how -the skills, knowledge, qualifications, and attributes that help one to get to their outcome.	Coaching conversation -Work towards goals through brain-based coaching conversation.
Will (or Way Forward)-Commit to specific actions to achieve the goal.	Action -Support the coachee to follow the action and decision making.	Creative solutions -other solutions that the mentor and mentee might come up with during their discussion.	Affirm + Action -Affirm what has been working well and what actions need to take progress.	Connecting the brain and conquering barriers -Facilitate the coachee's connecting long term memory and hardwiring and build confidence.
	Review -Provide feedback to the coachee.	Conclusion -a decision about what to do next and a commitment to take action.		Completion -The coachee checks how they feels about the goal and or set new goals while coach reviews the coachee's feelings and provides general feedback.

According to these coaching models, the mutual essence of coaching is the active and effective collaboration between the coach and the coachee through an abundance of dialogues to achieve set goals. The common coaching process that emerges from these models, which can perhaps be applied to classroom teaching, to be shown as follows:

- (1) Identify problems, challenges, concerns of the learner through asking questions and listening to them with empathy;
- (2) Set possible goals and plan actions to overcome those challenges;
- (3) Act towards achieving the set goals with sufficient emotional and academic support by providing knowledge, practice with the students, checking in with them of how they are feeling during the process, and giving continuous feedback; and
- (4) Evaluate their outcomes and set a new set of goals.

By altering the role of teacher to that of, students' cognition and emotion are enhanced. This can be supported by Park (2013) who mentions that those cognitive and emotional factors integrated in instruction can greatly provide effective learning outcomes of young children. She further points out, based on a study of Hyson (2008), that a critical teaching tool for teachers is being aware of students' emotions in instruction. It is obvious that the traditional teacher role will not facilitate and support students as much in online learning. Emotional aspect has become one of the factors affecting students' learning development and achievement. Hence, a teacher-coach role is essential. The next section will explain how to develop into an effective professional teacher-coach in the digital age.

6. Creating Effective and Professional Teachers in the Digital (Pandemic) Age

The sudden shift from the classroom to online teaching has brought significantly changes to all the mechanisms of learning in higher education. An Online class, handled by a teacher/coach, has turned out to be very pertinent in higher educational foundations. Saminathan and et.al., (2021) added that many academics, particularly the senior ones, encountered technical difficulties in performing their roles as educators given the fact that they had to be tech savvy in order to conduct a single online class. Thus, they had to be flexible and professionally-capable in this "New Normal" set-up, which is indeed vital in the continuity and quality of education our future generations will receive.

Careful Planning and Online Class Management

Having an organized and well-planned lesson makes any class interesting and engaging, especially during pandemic times wherein you only see the students on a monitor screen. Rubio (2010) states that it assists with effective use of oral questioning, giving instructions, being flexible, and having an impact on the students' stimulation to encourage their interest and participation. Effective teachers should give meaning to the subject by facilitating relevant material to the students wherever possible, and by finding means to stimulate interest in it. Learning visual aids like PowerPoint, Canva, Google Slides, and YouTube should be optimized, readily available, and regularly updated.

Effective teachers manage the online class to focus on instructions which influences the students in terms of psychological behavior to learn. Synchronous classes done in ZOOM, for example, are managed according to the needs of the students and the teacher. Online classroom rules are set at the beginning of the course and implemented accordingly. For example, online assessments like listening tests and quizzes can achieve credible results by asking the students to turn-on their camera during the test duration.

Creating the Environment of Fun

It is not easy to ensure consistent engagement from students with this current norm in education. Several techniques and methods can be applied in order to make students involved in the synchronous class, and making the class engaging starts with the idea of it being FUN. To do so, Gurney (2007) points out that when the teachers show enthusiasm, and there is interaction in the classroom, the work of the learning process is turned into a pleasure. In addition, teachers who are enthusiastic about their subjects and learning, and motivate students, are therefore helping to increase their achievement (Stronge and et al., 2004). Below are some suggestions of Hardy (2020):

- Choose excitement about teaching
- Keep up the momentum. Reward quick reactions.
- Be accessible. Use chat. Use LINE chat or Messenger to have a casual discussion with students
- Be creative. Use Online Tools for teaching.
- Use the participation list if you are in Zoom.
- Reward participation in chat and follow up activities outside of class.

Continuous Learning Development

Teachers should have high expectations of themselves and their own learning development. They should constantly self-evaluate, critique and reflect on how they are implementing their methods of teachings, and regularly update themselves with the latest teaching tools and materials suitable for online teaching. Investing in training/seminars is very crucial in the teachers' digital knowledge. An institution is can perhaps take responsibility to support and train its staff in using all these tools. Teachers can also share tips as they learn these new technologies, applications and methods. Stronge et al (2004) states that teaching is a profession; while the most effective teachers are passionate about their chosen profession. However, he also adds that an effective teacher is always in a constant learning process due to changes in terms of the students' characteristics, the curriculum, the community, and finance among many others.

7. Conclusion

The pandemic has a vast impact on education around the world, namely less time spent in learning, stress, a change in the way students interact, and the lack of learning motivation (Di Pietro et al, 2020). In Thai education, online learning has been a major struggle and unpleasant experience for Thai students in all levels of education. In order to ease this unpleasant experience and enhance students' satisfaction, learning behaviors, and academic achievements during this difficult time, teachers are to reconsider their role and perhaps change it from

a knowledge provider to a coach or facilitator. Having a nurturing and supportive learning environment for students, therefore, is beneficial for their learning development, especially for those who are struggling during the COVID-19 pandemic. Students need to feel safe and comfortable in order to learn successfully. Creating a positive affiliation towards learning by building a healthy teacher-student relationship, where students can freely express opinions and make mistakes without the fear of humiliation, and where they can receive an abundance of support and motivation through healthy and relaxing conversation with their teacher-coach. On the other hand, an institute needs to provide sufficient support and time to their staff to create effective and professional teacher coach in the digital age. Hence, training or a workshop on a new role of teacher as a coach is strongly suggested as part of a professional development program.

8. Suggestion

Besides the focus on teaching methods and activities, a focal point of psychology education—understanding students' emotion as a primary ingredient in teaching during online learning or distance learning—is something to consider for online teaching and learning during the pandemic. Changing the role of teacher to coach is perhaps something to be added in a professional development program and something to be encouraged by an institute. This paper suggests that the role of teacher needs to change. By altering the role, a nurturing and supporting learning environment is built, which is most crucial for a virtual classroom. School or university administrators should promote coaching instruction and educate teachers to understand what coaching is and be able to transform themselves into coaches. In addition, research studies on coaching in education should be conducted to find best practices in teaching and learning.

9. References

- Cambridge Dictionary. (2021). *Meaning of coaching in English*. [Online]. Retrieved on 13 September 2021, from <https://dictionary.cambridge.org/dictionary/English/coaching>
- Cherry, K. (2021). *Self-Determination Theory and Motivation*. [Online]. Retrieved on 13 September 2021, from <https://www.verywellmind.com/what-is-self-determination-theory-2795387>.
- Chiu, T. K. F., & Hew, T. K. F. (2018). Factors influencing peer learning and performance in MOOC asynchronous online discussion forum. *Australasian Journal of Educational Technology*, 34(4), 16-28. [Online]. Retrieved on 13 September 2021, from <https://doi.org/10.14742/ajet.3240>.
- Chonghui, L. (2020). *Conducive environment is a must for learning*. [Online]. Retrieved on 13 September 2021, from: <https://www.thestar.com.my/news/education/2020/07/26/conducive-environment: a-must-for-learning>
- Di Pietro, G., Biagi, F., Dinis Mota Da Costa, P., Karpinski, Z. and Mazza, J., The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets, EUR 30275 EN, *Publications Office of the European Union*, Luxembourg, 2020, ISBN 978-92-76-19937-3, doi:10.2760/126686, JRC121071.

- Dr.R.Saminathan, & P, Hemalatha. (2021). *TEACHING ONLINE -A CHALLENGE TO SENIOR ACADEMICIANS*. Retrieved on September 16, 2021. [Online]. Retrieved on 13 September 2021, from: <https://www.researchgate.net/publication/349761470>
- Hardy, Susan Mathews. (2020). *Increasing Student Engagement in Online Synchronous Courses*. [Online]. Retrieved on 16 September 2021, from https://www.researchgate.net/publication/348579540_Increasing_Student_Engagement_in_Online_Synchronous_Courses
- Hemkrasri, A. (2018). The Satisfaction of E-Learning Lessons of Biology Laboratory Courses of Department of Biology, Faculty of Science, Mahidol University. *Proceedings of the 6th National Conference 2018. Faculty of Management Science, Silpakorn University*. [Online]. Retrieved on 14 September 2021, from: <http://www.rdi.rmutsb.ac.th/2011/download/R2R62/R2R/19.pdf>
- Hindman, J.L. (2004) "Handbook for qualities of effective teachers" Association for Supervision and Curriculum Development, Alexandria, VA, USAMindTool. (2021). *The GROW Model of Coaching and Mentoring: A Simple Process for Developing Your People*. [Online]. Retrieved on 13 September 2021, from https://www.mindtools.com/pages/article/newLDR_89.htm
- Keawchan, N. & Rattanaongpinyo, T. (2021). The preparation of online learning and student's expectation for educational effectiveness at Faculty of Management Science, Silpakorn University. *Proceedings of The 9th Muban Chombueng Rajabhat University's National Conference 2021*. pp. 138-148.
- Lertsakornsiri,M., Narumitlert, J., Samutpradit,K. (2021). Factors Effecting on Learning Behaviors with Students' Online Learning in Saint Louis College from COVID-19 Situations. *Journal of Health and Health Management* Vol. 7 No. 1 JANUARY-JUNE 2021, p.13-17. [Online]. Retrieved on 13 September 2021, from file:///C:/Users/rockley/Downloads/Documents/V7No1-At2.pdf
- Maslow, A.H. (1943). A theory of human motivation. *Psychological Review*, 50, p. 370-396.
- Moreno, R.C. (2009). "Effective teachers –Professional and personal skills", en ENSAYOS, *Revista de la Facultad de Educación de Albacete*, No 24. [Online]. Retrieved on 13 September 2021, from <http://www.uclm.es/ab/educacion/ensayos>
- OpenLearn. (2020). *Exploring career mentoring and coaching*. [Online]. Retrieved on 13 September 2021, from <https://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=74588§ion=3.1>
- The Oxford Advanced Learner's Dictionary. (2021). [Online]. Retrieved on 13 September 2021, from <https://www.oxfordlearnersdictionaries.com/definition/english/coaching>
- Park. M., (2013). *Offering emotional support to young learners. Texas Child Care quarterly* / fall 2013 / VOLU ME 37, NO. 2[Online]. Retrieved on 13 September 2021, from childcarequarterly.com
- Petrie, C. (2020). *Spotlight: Quality education for all during COVID-19 crisis* (hundrED Research Report #01). United Nations. [Online]. Retrieved on 13 September 2021, from <https://hundred.org/en/collections/qualityeducation-for-all-during-coronavirus>

- Pokhrel, S., & Chhetri, R. (2021). *A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning. Higher Education for the Future*, 8(1), 133-141. [Online]. Retrieved on 13 September 2021, from <https://doi.org/10.1177/2347631120983481>
- Stronge, J.H., & Others (2020). Impact of e-learning during COVID-19 pandemic among nursing students and teachers of Nepal. *International Journal of Science and Healthcare Research*, 5(3).

AN EXPLORATORY STUDY ON APPLYING TEACHING CONTENTS IN ONLINE LANGUAGE CLASSROOMS

Akhil Augustine

Faculty of TESOL International Program, Thongsook International College

E-mail: akhilaugustine256@gmail.com

Sasiwan Intraskul

Faculty of TESOL International Program, Thongsook International College

E-mail: giftsasiwan1989@gmail.com

ABSTRACT

Due to the contemporary situation of the Covid-19 pandemic, the rise of using technology tools as a part of everyone's lives or what is now widely known as living in a 'new normal' era has become extremely crucial. The impact caused within the educational field has changed from onsite to online learning completely where many parents are still anxious about whether this system is effective and whether their children will fulfill their learning objectives. To gain a clear knowledge of this aspect, the research is conducted to see which online instructional approaches can be used in an English language classroom. Three online content approaches to this are synchronous learning, asynchronous learning, and blended learning. Moreover, the study utilizes an exploratory sequential mixed methodology to extract and examine different data to examine which of these can be considered as the most promising approach to online language classrooms. As a result of teaching development throughout the short time, it was concluded that blended learning or reverse classes are highly recommended by educators to apply in the successful development of an online course. In the end, the goal of this study is to gratify the researcher's drive and enthusiasm for more knowledge, investigate the feasibility of conducting a more in-depth study and explore the implementation approaches in future research studies.

Keywords: E-Learning, Synchronous, Asynchronous, Blended Learning

Introduction

In the modern era, English language is now used as the medium language to communicate, and it is the official language of the Association of Southeast Nations (ASEAN). Thailand is one of the members of the ASEAN community since 1967. According to the United Nations Educational Scientific and Cultural Organization (UNESCO, 1972), they had beautifully pointed out that lifelong learning is meant to enhance human development and the fulfillment of man. Later, the Organization of Economic Cooperation and Development (OECD, 1996) also emphasized that it is seen as the means to upgrade an individual's skill to be compatible with technological development and the changing world of work (p.460). During the past two years, teachers taught

online language learning due to Covid-19. There are some platforms to teach online classes for language learning, but teachers are struggling which is best method for teaching in online classes. Shahabadia and Uplane (2014) states that synchronous and asynchronous e-learning methods improve students' academic performance. Ellen and Newcombe (2011) states that when teachers use blended learning methods, learner outcomes improve. In the 1970s, the concept of lifelong education was introduced throughout the world.

2. Research Objective

1. To study the effectiveness of each online instructional approach applied in English language classrooms.

2. To explore the impact of using blended method in teaching English language online through interviews on student satisfaction.

3. Literature Review

Lecturers must view themselves as lifelong learners who began their careers as individual learners. As their careers progress, their biographies are shaped by a variety of events and ideas. This is the fundamental reason why each lecturer decides to teach their pupils uniquely.

3.1 Theory and Related Research

According to Livingston (2013), five essential experiences contribute to the development of high-quality professional learning as follow. a) Lecturers convey their expertise through the ideas they have encountered – This is when lecturers begin organizing their lessons for the course. First, the lecturer is instructed to plan what they will teach in each class using the course description. b) Both teachers and students gain an understanding of one another by delving into their preconceptions about what they have previously learned. Appropriate changes should be made after lecturers get an understanding of their student's level of skill. This happens only when the objective learning outcome is either too difficult or too easy for the learners. c) Lecturers provide learning opportunities for students and foster a more nuanced view of the link between curriculum, assessment, and pedagogy - Biggs (1999) suggested that a deep system emerges from students' desire to comprehend and seek meaning, prompting them to connect concepts and ideas to prior experience and critically assess incoming information for patterns and reasons. This is where active learning takes place in this study using a collaborative method. d) Dialogue is a legitimate form of professional learning - Communication is critical in every situation where information must be exchanged to track a learner's educational progress e) Well-trained mentors to aid as learners - By assisting, lecturers have an infinite number of options to meet their pupils.

It is the lecturer's goal to stimulate deep learning and create more conducive environments for the learners throughout the semester. When it comes to choosing an appropriate teaching strategy, the lecturer must first look at the course objective to focus on skills that must be developed. In 1996, Ferrari and Wesley presented a summary on six learning styles, called "Grasha-Riechmann Student Learning Style" (Riechmann & Grasha, 1974). In relation to the pandemic, active learning approach can certainly be one of the best choices for teachers to create their content based on this teaching strategy. In terms of pedagogy, these techniques help to stimulate

initial ideas (Silberman, 1996). The term ‘active learning’ comes from a theory of learning; constructivism that highlights the fact that students build their own understandings. In addition, an example can be taken from Cambridge Assessment International Education where active learning is being applied as a classroom approach to ensure that the students remain active throughout the learning process that is built upon knowledge and understanding regarding learning opportunities given by the lecturer. By fostering students’ learning and their autonomy, it increases the opportunity for them to control over their learning, allowing them greater involvement and most importantly the skills to foster life-long learning. In relation to an online classroom, active learning approach can be delivered through two different types of teaching content.

3.2 Online Classroom Teaching Concepts

Asynchronous Learning Content - While most people are still struggling with deciding as to which content should be used in online learning, asynchronous learning content seems to be the easiest choice. As per findings on asynchronous online learning, students would have a more meaningful learning experience in interactive educational contexts (Pratt & Palloff, 2011). The content refers to an offline communication tool such as the Google Classroom application. This allows learners to learn on their own time whenever they are free. With its advantages in flexibility that learners can access any time, the content normally includes videos, graphics, slide decks, bulletin boards, etc. Asynchronous online participatory learning entails a succession of immensely complex and ill-defined activities that require participants to reflect on and confront their traditional modes of learning while introducing a strong identity as a learner (Palloff & Pratt, 2011). These surroundings are purposefully designed to foster a community throughout participants and to give opportunities for collaborative conversation. Furthermore, these interactions drive participants to actively develop new interpretations about the course work (Conrad & Donaldson, 2011; Lehman & Conceição, 2011).

Synchronous Learning Content - When it comes to applying synchronous learning content, it can be considered as an extremely useful distance learning tool that allows both instruction and learning interaction to occur at the same time. Asterhan and Schwarz (2010) emphasized that there's been little discussion on how to effectively support learners in synchronous virtual learning environments in more latest studies on synchronous communications. Other studies discovered that when participants engage in synchronous learning vs asynchronous learning, they (a) construct a solid form of communication, (b) keep on task, (c) have a stronger sense of connection, and (d) ultimately boost task/course completion rates (Chen & You, 2007; Mabrito, 2006; Hrastinski, 2010). In terms of video conferencing in synchronous university education, Han (2013) investigated the impact of teacher video casting on their students' sense of connection to the instructor. By utilizing video casting, In relation to its benefits that teachers choose this content learning to design their online classrooms are mainly because of the following: the ability to provide direct instructions to learners in real-time, it can be seen as the closest way to have a similar classroom interaction atmosphere, and last but not least, structured learning can be accomplished. At this point, learners are required to pay attention simultaneously where they may be asked to discuss a certain topic or even answer the questions that are being raised. This allows the teacher to control the pace of the group learning process and as well monitor those who are struggling in understanding. Han's research

also pointed out that participants could participate in meaningful interactions with the instructor and classmates, therefore reducing what Moore (1993, 2013) referred to as transactional distance. Moore (1993) describes transactional distance as a pedagogical notion that distance learners experience via their interactions with one another and that shapes the nature of their relationship. To begin with, the lack of flexibility in learning may occur due to the reason that all participants must attend real-time discussions. One might argue that today's technology may facilitate synchronous education but to over-rely on the tools may also lead to potential disadvantages in some societies.

Blended Learning Content - Many organizations are now taking the advantage of the combination in moving from traditional face-to-face classroom learning to offline recorded lessons and real-time lessons via the internet. Flipped classroom is widely known as a methodological innovation promises to broaden students' intellectual horizons by offering more alternatives for distinctive learning experiences. Additionally, it increases their learning and academic success (Carman, 2005) and may utilize in many levels of education as online or e-learning (Hussain, 2007). The concept of a group-based flipped classroom has been applied where the model introduces a new element to assist language learners in learning. It can be said that teachers should attend to the complex relationship between structure and dialogue (Saba & Shearer, 2017). Blended learning is matched very often with learners' instructional requirements. It enables them to access cutting-edge sources of information and best practices in education and pedagogy at their speed and convenience (HP Development Company, 2016). In 2014, Garcia, Abrego, and Calvillo who are lecturers at a university in USA has conducted a qualitative study to ascertain graduate students' opinions of blended education and the study demonstrated the benefits of blended learning by stating that "the hybrid [blended learning] model enables greater flexibility, social interaction, and engagement among students, as well as more in-depth learning experiences that would not be possible through other instructional delivery methods" (p.11).

3.2 Research Framework

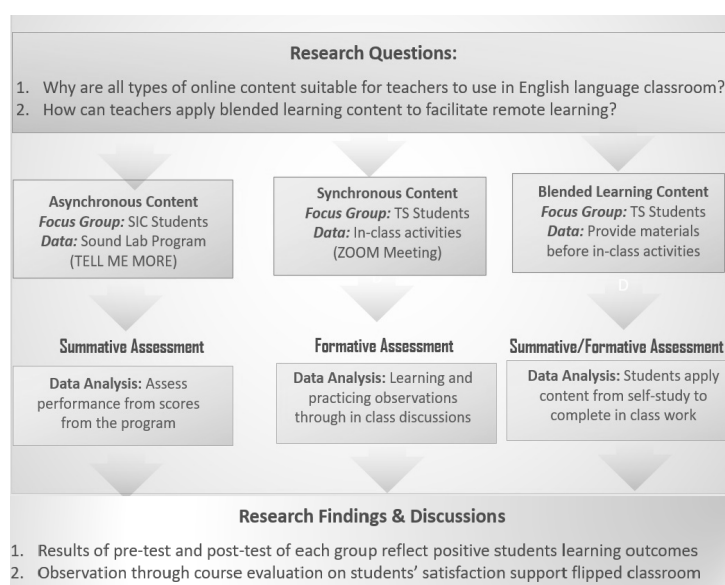


Figure 1 Theoretical Framework Adapted from Herstatt (2009)

4. Research Methodology

4.1 Research Design

The participants 36 students who has studying Bachelor of Arts, majoring in teaching English to speakers of other languages (TESOL) from Thongsook College Bangkok Thailand. They were divided into three groups. The research was design quantitative data from survey before and after and qualitative data form interview each group representative. The study was conducting 3 weeks of academic year 2021.

4.2 Research Instrument

The first set of asynchronous content learning is based on SIC 12 first-year students from three different majors: airline, business, and tourism. The use of Tell Me More computer software is the controlled instrument. The second set of synchronous content learning is based on 12 first-year students from Bachelor of Arts, majoring in teaching English to speakers of other languages (TESOL) who were enrolled in a course for technology-assisted language learning at Thongsook College and 12 first-year students from Bachelor of Arts, majoring in teaching English to speakers of other languages only take face to face through Zoom Meeting application is used as the controlled instruments. In the out-of-class video that is provided to the students to review before survey and attending after survey the following class is applied as an experimental instrument. In the last week each group representative was interview by the researchers.

4.3 Data Collection

The data used as asynchronous learning content has been taken from a course that Ms.Sasiwan has taught at Sripatum International College (SIC) during semester 2/2017. Intermediate English (GEC122) was a continuation subject of Fundamental English with an emphasis on intermediate-level skills. Students are required to attend a self-learning section called 'Sound Lab' for one hour and a half every week to train their listening and speaking skills throughout the course, which is taught over 15 planned weeks. This section accounted for twenty percent of the student's total grades.

One of the sections is based on the use of 'Tell Me More', which is software that provides language learners with a wide range of tools to address speaking and listening. The creators claimed to have over 2,000 hours of learning and therefore could be seen as one of the best learning tools that could be incorporated into the class. Twelve different topics out of twenty were given to the students to complete during the weeks where they would be marked as twenty percent of their total grades.

The data used for both synchronous learning content and blended learning content were taken from a class taught by Mr. Akhil at Thongsook International College. The course was taught for three weeks of the summer semester of 2019. Students were separated into two different groups with two planned teaching approaches.

The concept of group-based flipped classrooms has been applied where the model introduces a new element to assist language learners in learning. The instructor offers a video and other resources to the students

before they come to class with the hope to encourage them to develop critical thinking skills and collaborative competencies.

4.4 Data Analysis

The data from online language learning were analyzed with the mean (M), standard deviation (S.D), and analysis of variance (ANOVA). The teacher's interview will be allowed to reflect on teaching an online class.

5. Research Findings

The results were analyzed using ANOVA to compare the online language learning from three groups before and after each class activity.

Table 1 The difference between the three groups' activities

Source	Type III sum of square	<i>df</i>	MS	F	Sig.
Correct Model Intercept	11.33	14	.81	1.34	.264
PP Difference	11.33	14	.81	1.34	.264
Error	12.67	21	.60		
Total	168.00				
Corrected total	24.00				

The descriptive data shows that three groups have had online language learning activities for three weeks. Table 1 shows each group's practice before and after the online learning language activities, not significant, which means learning with three online teaching methods to boost was the same.

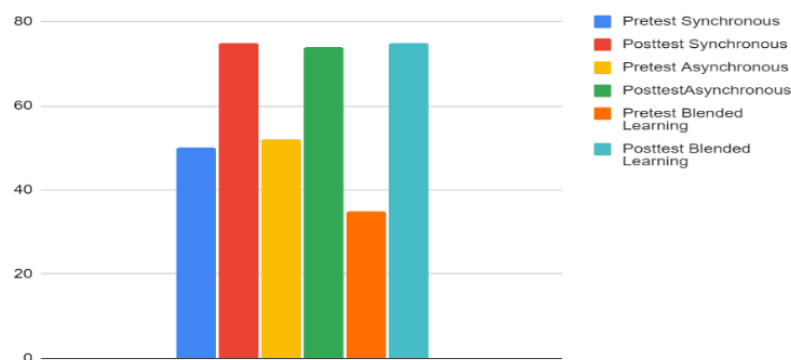


Figure 1: Descriptive data three weeks activities

The descriptive data were analyzed as three weeks data pretest and posttest online language learning activities. This figure shows each group's practice before and after the online learning language activities, not significant, which means learning with three online teaching methods to boost their students' speaking skills.

5.1 Data from Interview

The data from the interview is to find differences between teachers' perceptive learning before online and after online learning classes and advice solutions. The reflections from teachers' three activities help them to interact with students.

6. Discussion & Conclusion

In relation to the first objective, online teaching methods improve students' speaking skill in online learning language. The 36 participants learning fundamental English were asked to practice three types of activities in three groups. Table 1 revealed that the results of differences between before and after online language learning are not significant, which means three gap activities are useful tools for online language learning.

To answer the second objective, the difference among each of the online learning content and see which one is proven to be the most effective. Among the three groups, two representatives were asked about the three online language learning. The six representatives said three activities help them improve their online language learning and allow them to have confidence in online learning. Therefore, students' learning online in classes such as synchronous, asynchronous, blended learning has as much ability to increase learning languages as much as in a classroom environment. Francescucci and Rohani (2019) found that synchronous learning students have high performance and interaction outcomes. Corfman and Beck (2019) state that asynchronous online learning classes gain interaction in virtual classrooms. Thus, it can be said that blended learning measures student and instructor perceptions of the hybrid approach so that shapes could be made to the course design before moving to lesson planning (Kenney, 2011).

In conclusion, teachers prescriptive online learning languages increase their knowledge to teach online English language. It is advisable for lecturers to apply flipped classroom to their teachings since blended learning also can boost the student to participate in teaching and learning in the online class. The researchers sincerely hope that these synchronous, asynchronous, blended learnings are pedagogical implications and suggestions for further investigations.

7. Suggestion

As English lecturers in higher education, it is important for us to not only have a good understanding of technological usage but choosing an appropriate teaching method is also necessary.

8. Acknowledgement

We would like to express our sincerest gratitude to our research advisor, Dr.Pornchit Arunyakanon, for the continuous support, recommendations, and guidelines provided throughout the study. We'd also like to show our appreciation for her patience, motivation, enthusiasm, and immense knowledge. Also, on behalf of the TESOL faculty, we are both happy that as educators, we have received full support from everyone within the college.

9. References

- Al-Marooof, R. A. S., & Al-Emran, M. (2018). Students' acceptance of Google classroom: An exploratory study using PLS-SEM approach. *International Journal of Emerging Technologies in Learning (iJET)*, 13(06), 112-123.

- Bowon, K. (2010). *E-ASEM White Paper: e-Learning for Lifelong Learning*. [Online]. Retrieved September 2021 from: <http://press.knou.ac.kr>
- Brown, B. A. (2016). *Understanding the Flipped Classroom: Types, uses, and reactions to modern and evolving pedagogy*.
- Chen Hsieh, J. S., Wu, W. C. V., & Marek, M. W. (2016). *Computer Assisted Language Learning*. Retrieved Using the Flipped Classroom to Enhance Efl Learning: <https://www.tandfonline.com/action/showcitformats>.
- Corfman, T., & Beck, D. (2019). Case study of creativity in asynchronous online discussions. *International Journal of Educational Technology in Higher Education*, 16(1), 1-20.
- David, S. & Teresa, B. (2005). *Doing Action Research in Your Own Organization*, 2nd Edition. Trowbridge Wiltshire, Great Britain: SAGE Publication, Crownwell Press Ltd.
- Ferrari, J.R., Wesley, J.C., Raymond, N.W., Erwin, C. N., Bamonto, S. and Beck, B.L. (1996). Osychometric properties of the revised Grasha-Riechmann student learning style scales. *Educational and Psychological Measurement*, 56(1), p.166-172.
- FLN. (2014). Retrieved from https://flippedlearning.org/wp-content/uploads/2016/07/FLIP_handout_FNL_Web.pdf
- Francescucci, A., & Rohani, L. (2019). Exclusively synchronous online (VIRI) learning: The impact on student performance and engagement outcomes. *Journal of Marketing Education*, 41(1), 60-69.
- Garcia, A., Abrego, J., & Calvillo, M. (2014). A study of hybrid instructional delivery for graduate students in an educational leadership course. *International Journal of E-Learning & Distance Education*, 29(1), 1-15. Available online at: <http://ijede.ca/index.php/jde/article/view/864/1534>.
- Huang, X., Chandra, A., DePaolo, C. A., & Simmons, L. L. (2016). *Understanding transactional distance in web-based learning environments: An empirical study*. British Journal of Educational Technology
- Kenney, J., & Newcombe, E. (2011). Adopting a blended learning approach: Challenges encountered and lessons learned in an action research study. *Journal of Asynchronous Learning Networks*, 15(1), 45-57.
- Moore, M., & Kearsley, G. (2012) *Distance Education: A Systems View of Online Learning* (3rd edition) Belmont, CA: Wadsworth Cengage Learning.
- Saba, F., & Shearer, R. L. (2017). *Transactional Distance and Adaptive Learning: Planning for the Future of Higher Education*. Milton, UNITED KINGDOM: Routledge.
- Shahabadi, M. M., & Uplane, M. (2015). Synchronous and asynchronous e-learning styles and academic performance of e-learners. *Procedia-Social and Behavioral Sciences*, 176, 129-138.
- Urfa, M. (2018). Flipped classroom model and practical suggestions. *Journal of Educational Technology and Online Learning*, 1(1), 47.

CHALLENGES TO ENERGY SECURITY IN MYANMAR BETWEEN 2011 AND 2020

Clara Mang Sui Tang

Master of Arts in International Development, Political Science, Chulalongkorn University

E-mail: maclaratang@gmail.com

ABSTRACT

The more advanced a society gets, the more it depends on energy. Energy is relational to the three pillars of sustainable development. Therefore, energy security – defined as having sufficient energy to satisfy domestic consumption, is crucial when addressing the broader socio-economic development of a country. This study investigates energy security in Myanmar between 2011 and 2020, using 2011 as a baseline, both from a policy analysis viewpoint, as well as analyzing macro secondary data of the total primary energy production (TPEP), the total primary energy supply (TPES) and the total final energy consumption (TFEC). This study concludes that despite the increased demand of energy due to economic growth and population increase over the years, Myanmar was able to generate and import energy to maintain its energy security level. Although the country's future is clouded by the ongoing political chaos, it is vital to reflect now on the level of energy security in Myanmar from 2011 to 2020.

Keywords: Energy security, Energy policy, Myanmar

1. Introduction

For several decades, energy has been introduced to the sustainability agenda of the world – linking, at first, to the environmental pillar, and then, gradually with the economic and social pillars (Davidsdottir 2012). Although energy is not a “need” in absolute terms, it is a means to achieve adequate living standards, education, and health care etc. (Najam and others 2003). Therefore, even if energy does not have any impact on the environment whatsoever, it would still be a key issue for a policy of sustainable development on the economic and social dimensions (Najam and others 2003). As a modern society is deeply dependent upon energy, achieving energy security is crucial for nations to achieve not only sustainable energy supply but also the wider sustainable development of the country. After being ruled by military government since the 1962 coup, a semi-civilian led government, chaired by President Thein Sein, took office in 2011 and initiated several critical reforms in various social and economic sectors, including a major reform in the energy sector and, furthermore, initiated critical legal and policy reforms in the energy sector (Duane Morris & Selvam LLP 2020; Than 2014). Several key plans and roadmaps for the energy sector were also established by Thein Sein's government. When the NLD government came into office in 2016, after a landslide victory in the general election of 2015, all these national

strategies and plans were adopted including the strategic plan to achieve universal electrification by 2030. This study, unlike other current academic studies concentrated on renewable energy or the electrification of Myanmar, examines Myanmar's energy security as a whole, from both a macro-data and energy policy analysis viewpoints.

2. Research Objective

This research investigates the level of energy security in Myanmar between 2011 and 2020. This is done by investigating macro secondary data of the total primary energy production (TPEP), the total primary energy supply (TPES) and the total final energy consumption (TFEC) and existing energy policies. This paper offers, based on the research it conducted, suggestions for policy changes which will strengthen the country's energy security by adopting both modifications to the government's export-oriented energy policies, as well as solutions to securing financing for the energy sector, while adopting progressive environmental changes.

3. Literature Review: Theory, Concept and Related Research

The research takes advantage of the concept of energy security. Energy security can be studied in various ways, such as studying the level of energy generation a country possesses or accumulates, including from imports, its energy reserves, the estimate lifespan of the energy resources the country possesses, the quality and quantity of the energy supply and transmission/distribution, or even the perception of the population as to whether it feels that it has sufficient energy supply to consume. The study of energy security can be compared to a patient's medical checkup (a model example used by IAEA and others 2005). The patient's health can be evaluated in several ways: body temperature, weight-to-height ratio, blood pressure, pulse rate, cholesterol level, etc., to mention just a few. Conclusions can be drawn from how these numbers change over time, whether a patient's health is improving or deteriorating. However, the same data cannot be used to evaluate the health of another person. The same "open-ended" analysis method can be applied to the energy security of a country. How secure should the energy of a country be, or how fast a healthy person should be able to run? Even though there is no universally agreed level of security of a country's energy, as in the health example, governments could and should aim for a progressively improved trend to evaluate a country's success.

This paper amplifies the definition of energy security of Yao and Chang (2014) – possessing sufficient energy for its domestic consumption, and evaluates the total primary energy production (TPEP); the total primary energy supply (TPES); the total final energy consumption (TFEC); and analyze national energy policies. The total primary energy production is defined as the accumulation of all the energy production of the country, the total primary energy supply (TPES) as the sum of all primary energy sources including imports (Hanania and others 2020), and the total final energy consumption (TFEC) as the energy used by the final consumers and excluding what is used by the energy sector itself, including, but not limited to deliveries, transformation, distribution loss etc. (EuroStat 2018).

4. Research Methodology: Research Design, Data Collection & Analysis

This research used a qualitative research method to thoroughly understand energy security in Myanmar. Due to COVID-19 travel restrictions between Thailand and Myanmar, and limited access to key Myanmar governmental officials and energy experts residing in Myanmar as a result of the ongoing political crisis and COVID-19, documentary research, desk research, secondary statistics and data from various reliable and reputable sources were heavily relied on. The data and information sources included, but are not limited to previous research, World Bank, IFC, Ministry of Electricity and Energy, Ministry of Mineral Resources and Environmental Conservation, Ministry of Agriculture, Livestock and Irrigation, Ministry of Education, Directorate of Investment and Company Administration, other relevant government agencies, various foreign chambers and business associations in Myanmar, and other international organizations.

This paper used secondary data from various sources to study the total primary energy production (TPEP), the total primary energy supply (TPES), and the total final energy consumption (TFEC) of Myanmar. Moreover, from a policy analysis standpoint, it also investigated the energy-related policies in Myanmar, including but not limited to, various national energy policies, Myanmar Sustainable Development Plan (MSDP), Myanmar Climate Change Strategy (MCCS) and environmental policies in relation to the energy sector. Using 2011 as a baseline for comparison, any obtained empirical material was objectively processed and analyzed to draw a conclusion. This study was conducted over a period of seven months in 2020-2021.

5. Research Findings & Discussion

5.1 Evaluation of TPEP, TPES and TPEC

Myanmar's rich energy resources can be categorized into renewable and non-renewable. The former include hydropower, solar, wind, tidal, geothermal and biomass, while the latter include coal, oil, natural gas and fossil materials. At present, the country does not have a plan for nuclear energy. Its substantial raw energy reserves are estimated at 105 million barrels of oil, 6.58 trillion cubic feet of gas, 542.56 million metric tons of coal, over 100,000 MW in hydropower, 52,000 Terawatt-hours in solar, 4,000 MW in wind, and over 1,150 MW in tidal energy (ERIA 2020). However, having these massive reserves does not automatically result in energy security, the building which requires knowledge, capacity, and resources including finance, as well as government's good will to turn them into end-user friendly products. As discussed in the conceptual framework, although a country can never have perfect energy security for any scenario as a person cannot be too healthy, the ideal energy security policy would show an improving trend in the macro-production, transmission and distribution, with the supply meeting rising demand.

The country's TPEP, TPES and TPEC in 2011 were 22.5 Mtoe, 16 Mtoe and 14 Mtoe respectively (ERIA 2020). By 2017, the TPEP, TPES and TPEC of Myanmar were increased to 29 Mtoe, 21 Mtoe and 17 Mtoe respectively (ERIA 2020). During the study period, it was found that the total primary energy supply of Myanmar has been lower than the total primary energy generation due to its massive exports over the years (ADB 2016) – primarily gas exports which account for over 70% of its total gas production (Ministry of Electricity and

Energy 2017). Myanmar also exports electricity (which was equivalent to 13% of the total electricity produced between 2013-2016) to China since 2013 via cross-border exports in areas without connection to the national grid (ERIA 2020). ERIA reports of 2018 and 2020 show a notable increase in all the energy supply-chain between 2011 and 2017.

Table 1. Comparison of TPEP, TPES and TPEC Between 2011 and 2017

Total Primary Energy Production (TPEP)		Total Primary Energy Supply (TPES)		Total Primary Energy Consumption (TPEC)	
2011	2017	2011	2017	2011	2017
22.5 Mtoe	29 Mtoe	16 Mtoe	21 Mtoe	14 Mtoe	17 Mtoe
Average rate: 4% growth		Average rate: 4.6% growth		Average rate: 3.8% growth	

Mtoe = million tons of oil equivalent

Source: ERIA (2018); ERIA (2020)

As the economy of Myanmar grew over the last ten years, there was a direct demand increase for energy in the country. Not only that the existing population's demand for energy has increased, but the country needs to, simultaneously, address the demand of its increased population, higher wealth level, increased industrial activity, as well as additional integration into the national grid of those marginalized segments of the population without past access to electricity. The average population growth between 2010 and 2017 was about 0.8% per year (ERIA 2019). However, the overall total primary energy generation was also increased to meet the increased demand, even though the production of crude oil has declined at about an average rate of 7% per year between 2010 and 2017 (ERIA 2018). In general, all chains of energy generation, transmission, distribution and consumption increased at a relatively similar growth rate of averaging 4%. The energy dependency (ratio between the total energy import and the total energy supply) of Myanmar had increased from 7% in 2010 to 19% in 2017 – about a 3-fold increase (ERIA 2020). Myanmar is dependent on energy imports, mostly oil imports and a small share of coal (ERIA 2020). According to ERIA (2020), the energy security of Myanmar on the national level had not been deteriorating even though the energy dependency had increased three times in the last decade. Myanmar would certainly need to find ways to become less dependent on energy imports in order to have sustainable energy in the country. One of the main concerns, however, is the continuous huge share of biomass currently in the consumption. Even though it has decreased over time, it still contributed over 50% of the total consumption in 2017 (ERIA 2020). Biomass fills the gap in the country's energy security by fulfilling the energy needs of rural households, mostly unconnected to the national grid, which cause massive implications on deforestation, environment, and local health issues.

5.2 Energy Security Policy Analysis

At a national policy level, however, the energy security of the country has been under-addressed. Possessing substantial natural energy reserves, Myanmar needs not be concerned for lack of natural energy resources. It is only a matter of how much or whether it can extract and transform raw materials into final products.

Without a doubt, though, successive governments have lacked the will, know-how and/or tools to transform these energy resources into commodities. Professor Ricardo Hausmann of the Harvard Kennedy School of Government (2015) argues that the secret of economic wealth of nations is the “collective productivity” of the country, i.e., the ability to transform raw materials into a variety of products. According to him, the more products countries can produce by transforming raw materials into in-demand finished goods or services, the richer they are. In his example, in a scrabble game, the richer countries are those that can spell more words with their seven letters. Unfortunately, Myanmar currently lacks this ability, especially to enhance energy security for domestic consumption.

Myanmar’s energy policy, prior to the February 2021 military coup, addressed energy security through several laws and policies (NEP, the Foreign Investment Law, the Company Act, to mention a few) by providing more regulatory facilitations encouraging private sector participation in a heavily state controlled environment. Some examples of these incentives include the opportunity for foreign companies to invest in local companies, up to a maximum 35% ownership share, without changing the ownership nationality of the company, longer tax holidays, protection of foreign companies with MIC permits from nationalization, creating a more inclusive and transparent tender processes, etc. After the 2005 failure of the nationwide *Jatropha curcas* plant (*Kyetsui*) to produce biofuel, a project of the previous military government, successive governments have shifted their focus to extensive generation of energy from existing natural sources.

Nevertheless, current energy policies still fall short of adequately addressing the country’s energy security on two grounds. First, due to an export-oriented policy which requires exporting a large quantity of energy resources (particularly natural gas and electricity) before fulfilling the basic needs of its population, industry and agriculture, the country is left bereft of the resources needed to fulfill its power needs. For instance, between 2011-16, Myanmar exported about 70% of its explored natural gas and about 13% of its generated electricity to neighboring countries, while half of its population does not even have access to reliable modern electricity. While it may be impossible to revoke the existing energy export contracts (for instance, contracts of export to China and Thailand are valid for about 30 years after the signing date, with possible extensions), Myanmar can at least halt extending them and signing new energy exploration and generation contracts exclusively fulfilling its domestic demand.

The second concern is the failure to address sectoral mismanagement, which is the inability to fully take advantage of the energy potential of the country while improving the energy generation sector’s management. For example, Myanmar’s crude oil refineries are operating at an estimated 33% to 57% of capacity, according to the ADB 2012 report, and worse, the country is not building any new refineries. As a result, Myanmar has to import over 90% of petroleum products required to feed its domestic demand for oil, gasoline and diesel. Currently, Myanmar imports about 600,000 tonnes of oil per month, mainly from Singapore, which in turn buys its supply from other oil exporting countries (Myanmar Times April 2018). Thus, Myanmar pays an estimated price premium of USD 12 million per month (Myanmar Times Feb 2018). Furthermore, another challenge for Myanmar is the lack of sufficient oil storage infrastructure. In order to purchase oil directly from oil exporting

countries, Myanmar needs to increase its existing storage capacity by a factor of five (Myanmar Times Feb 2018). As of 2018, there were over 2,000 fuel stations and 50 fuel distribution companies in Myanmar (Global New Light May 2018), most of which do not have any significant fuel storage capacity. With the existing storage infrastructure, Myanmar oil importers can only store 20,000 tonnes of oil per shipment (Myanmar Times Feb 2018). Due to this fuel import dependency, and other factors (e.g., international fuel prices, USD/Kyat exchange rates, etc.), fuel prices in Myanmar fluctuate widely (Global New Light of Myanmar May 2018). Nevertheless, as of May 2018, Myanmar ranked second, after Malaysia, with the lowest fuel prices among the ASEAN countries (Global Petrol Prices 2018).

Over the past ten years under civilian governments, these energy resource exports (i.e., natural gas and electricity) boosted the foreign currency revenues of the country, which, in turn, was arguably used for the country's public healthcare, education, poverty alleviation, and the overall development of the country, thus benefiting the general population. For example, Myanmar's 2018 revenue alone from natural gas exports exceeded USD 3 billion, which represented half of the national export revenue (Myanmar Times March 2018). The question, though, is how many people actually benefited from this government revenue, thus being able to improve their living standards, education, healthcare, etc., to mention just a few. Moreover, what would have been the national benefit in increased investment and development if these exported resources were transformed into electricity for domestic consumption? To put it another way, how many trees would the country be able to save if modern electricity would have been available for cooking and general chores in rural households? One can conclude that looking just at the dollar value (i.e., the export revenues) does not reflect the big picture of development of the country, or that of its population. Given the estimated volume of energy reserves the country possesses, both in the renewable and non-renewable forms, Myanmar has the potential to generate and supply sufficient energy for its domestic consumption, now and in the future, as well as export the surplus to earn foreign currency.

6. Conclusion and Recommendations

As all nations are not at the same development stage at any one time, energy security strategy should be tailor-made for each country's unique circumstances. While wealthy countries are attempting to increase the share of renewable energy and introduce a decarbonized economy, developing countries, such as Myanmar, are still struggling to find a solution to universal electrification of the country. It is, therefore, impossible to develop a common baseline or ranking for the energy sector's sustainability that can equally be applied to each nation.

This study has found that energy security in Myanmar between 2011 and 2020 has been relatively stable. The soaring demand of energy in the country was met by different means during this period. Myanmar still is rich in energy resources. Its hydropower potential alone has the capacity to supply four times of the amount of electricity the whole country needs. There is, however, room for improvement in order to advance its energy security. To start, Myanmar government must adopt urgent policy changes to strengthen its energy security by eliminating export-oriented policies until its domestic needs are met, strengthening and securing financing in the

sector, focusing on further production of energy, upgrading underperforming power plants and infrastructure, specially including, but not limited to the transmission and distribution network, and finally, adopting bolder and progressive environmental considerations in the sector.

Irrespective of the ongoing political turmoil in the country, which is causing disruptions in the energy generation, transmission, distribution and imports, and the withdrawal of foreign companies' investment in the sector, the findings herein may contribute to a deeper understanding of the energy security level of the country between 2011 and 2020.

7. Acknowledgement

This study has not been possible without the love and support of my mother, family and friends. I dedicate this to my late father who loved and cared about me unconditionally. I hope I am able to make you proud.

My greatest gratitude goes to my thesis supervisor, Professor Balazs Szanto, Lecturer at Chulalongkorn University, for his tremendous support and encouragement in this journey. His expertise and advice have been highly valuable for my research. He has been the most helpful professor.

Lastly, I would like to thank Judy Benn for her mentorship and support.

8. References

- ADB. (2012). *Myanmar Energy Sector Initial Assessment: Context and Strategic Issues* [online]. Retrieved on 15 May 2021 from <https://www.adb.org/documents/myanmar-energy-sector-initial-assessment>
- . (2016). *Myanmar Energy Sector Assessment, Strategy and Roadmap* [online]. Retrieved on 15 May 2021 from <https://bit.ly/3rB6UOe>
- Davidsdottir, B. (2012). Sustainable Energy Development: The Role of Geothermal Power. *Comprehensive Renewable Energy*, 7, p. 273-297
- Duane Morris & Selvam LLP. (2020). *The Energy Regulation and Market Review – Edition 9* [online]. Retrieved on 1 May 2021 from <https://bit.ly/3aGHxVf>.
- ERIA. (2018). *Energy Demand and Supply of the Republic of the Union of Myanmar 2010-2017* [online]. Retrieved on 30 August 2021 from <https://bit.ly/3aR12cY>
- . (2019). *Myanmar Energy Outlook 2020* [online]. Retrieved on 3 April 2021 from <https://bit.ly/3qPlS24>
- . (2020). *Energy Supply Security Study for Myanmar* [online]. Retrieved on 3 April 2021 from <https://bit.ly/336EBvZ>
- EuroStat. (2018). *Glossary: Final Energy Consumption* [online]. Retrieved on 20 July 2021 from <https://bit.ly/3uHDajG>
- Global New Light of Myanmar. (May 2018). *Fuel Price Increase is an International Problem which We can't Avoid* [online]. Retrieved on 20 July 2021 from <https://bit.ly/3aQ1wQn>

- Global Petrol Prices. (2018). *Myanmar Fuel Prices, Electricity Prices* [online]. Retrieved on 20 July 2021 from <https://www.globalpetrolprices.com/Burma-Myanmar/>
- Hanania, J. Donev, Jason. (2020). *Energy Education - Total final consumption* [Online]. Retrieved on 20 July 2021 from https://energyeducation.ca/encyclopedia/Total_final_consumption.
- Huasmann, R. (2015). *Secrets of Economic Growth. Harvard Kennedy School of Government, USA*. Retrieved on 2 June 2021 from <https://bit.ly/3fTD5na>
- IAEA, Undesa, IEA, Eurostat, EEA. (2005). *Energy Indicators for Sustainable Development: Guidelines and Methodologies*. IAEA, Vienna.
- Ministry of Electricity and Energy. (2017). *Current Status of Oil and Gas Sector* [online]. Retrieved on 1 May 2021 from <https://eneken.iecej.or.jp/data/7392.pdf>
- Myanmar Times. (April 2018). *Government Reveals Plans to Build First Modern Oil Refinery in Myanmar* [online]. Retrieved on 2 June 2021 from <https://bit.ly/2PDefyC>
- . (Feb 2018). *Myanmar Considers Direct Imports, New Infrastructure to Lower Domestic Fuel Costs* [online]. Retrieved on 2 June 2021 from <https://bit.ly/3xCEIO2>
- . (March 2018). *Natural Gas Export Brings USD3Billion in this Fiscal Year* [online]. Retrieved on 2 June 2021 from <https://bit.ly/3v75xbh>
- Najam, A. and Cleveland, C. (2003). Energy and Sustainable Development at Global Environmental Summits: An Evolving Agenda. *International Journal of Environment and Sustainability*, 5(2), 117-138.
- Than, T. (2014). Introductory Overview: Myanmar's Economic Reforms. *Journal of Southeast Asian Economies*, 31(2), 165-172. Retrieved December 27, 2020, from <http://www.jstor.org/stable/43264712>
- Yao, L. and Chang, Y. (2014). Energy Security in China: A Quantitative Analysis and Policy Implications. *Energy Policy*, 67, 595-6-4. <http://dx.doi.org/10.1016/j.enpol.2013.12.047>

BLACK WOMEN'S VICTORY OVER THE PATRIARCHY IN ALICE WALKER'S THE COLOR PURPLE

Aphiradi Suphap

Department of Western Languages, Faculty of Humanities and Social Societies,

Thaksin University

E-mail: carpedium78@gmail.com

ABSTRACT

Black women in Alice Walker's *The Color Purple* are oppressed by men in many ways. They are excluded from male sphere: they are invisible, objectified, sexually, physically and psychological hurt. Yet, black female characters in this story do not succumb to their fate. They fight back to gain their victory over the patriarchal society. To elaborate the battle between black female characters and black male characters, women's fighting is mainly divided into three main types: mental fighting, spiritual fighting and physical fighting. For mental fighting, their ways of fighting are clarified as writing to express their own selves, disagreeing with the old beliefs that oppress women, and mentally condemning and criticizing men. Apart from mental fighting, spiritual fighting is categorized into two means: accepting fate optimistically and patiently and strong bond between the sisterhoods. Lastly, the physical fighting can be separated into five groups: convincing men to give women's opportunity, sexual exploration, expressing oneself through one's ability, hitting men to gain more freedom and power, and supporting among black women. Black female characters in this story attempt to establish women's sphere and exclude men from their territory. Men, thus, are quite invisible in the story. In conclusion, black female characters are visible, gaining their self-esteem and self-identity through their fighting, empathizing and supporting one another throughout male superiority.

Keywords: black women's victor, patriarchy, black female characters' fighting, *The Color Purple*, black female oppression

1. Introduction

Black women in *The Color Purple* by Alice Walker are oppressed by men almost throughout the story in various ways. Celie, the protagonist, is forced to marry with the man she does not like. Celie lives under male authority in her husband's house while her younger sister, Nettie flees from male dominance by being a missionary in Africa. Celie meets other black women while living with her husband which she called Mr. _____. Knowing Shug, a successful singer, makes Celie discover her true self. Later on, she leaves Mr. _____ and live with Shug. Shug encourages her to establish her own pants business. Celie becomes successful and also helps other black women by hiring them to sew the pants. After Celie departs,

Mr. _____ realizes that he is missing something and his life is emptiness. Celie comes to visit Mr. _____. She refuses to return to him but is willing to have him as a friend. At the end of the story, Nettie returns and reunites with Celie again after corresponding with each other for a long time. (Walker, 2003). These women have a great attempt in fighting for their rights. Men do not seem to respect women's rights. They are proud of their authority over women. They treat women as if they were not human beings. This oppression is obviously seen through the relationship of Celie, the female protagonist, and the male characters: her stepfather and her husband. There is, however, the oppression occurring among other female characters as well. To analyze how women in this story gain their victory over patriarchal society, the feminist theory of two French feminists Simone de Beauvoir (the theory of the Other) and Hélène Cixous (the theory of female body writing) will be applied to investigate the female characters here.

The oppression seen in *The Color Purple* is emphasized by the French feminist writer, Simone de Beauvoir's the concept of 'the Other'. De Beauvoir (1949 as cited in Pilcher and Whelehan, 2017, p.96) describes men as 'the One' whereas women are 'the Other'. Men see themselves as "the sole essential, denying any relativity in regard to its correlate and defining the latter [women] as pure otherness". In contrast, women perceive themselves as being related to men instead of being totally separated from them. de Beauvoir also states that "Thus, woman may fail to claim the status of subject because she lacks definite resources, because she feels the necessary bond that ties her to man regardless of reciprocity and because she is often very well pleased with her role as the Other". Women as 'the Other' are clearly seen in the black female characters. Yet, these women do not stay passive for too long. They transform from being abused and 'Other' to being 'the One', exclude men from their world and make them be 'the Other' instead. Their gathering enhances women's power. They listen, learn, share and empathize one another. These activities lead them to care, support and help one another to receive the better chance and have the place to stand on in the patriarchal society. The sharing of horrible life experiences gradually increases their power without realizing it. Moreover, their superiority comes in form of fighting.

Besides de Beauvoir's the concept of the Other, the French feminist, Hélène Cixous's female body writing is also employed to examine the protagonist's self-development. In her *L'écriture féminine* (1975) or female body writing, Cixous encourages women to have their own rights and own ways in expressing their feelings, thoughts, and ideas outside men's sphere through their own writing. Actually, women are confined in the sexist language and culture of patriarchy society. Women can be viewed through the language written by men only. Women, therefore, are visible and objectified only through the eyes of men in male writing. Cixous also remarks that in male dominant world, women are just the object of desire. They hardly have a chance to express themselves. In male world and male writing, they only demonstrate their own feelings without caring about women's feelings. Women are invisible to them. Women are excluded from male sphere in every way. It is very important for women to make themselves visible and the easiest way to gain visibility is expressing themselves through writing (Scholz, 2010, p. 32).

To elaborate how they gain victory over the male dominant world, the methods of fighting will be clarified respectively by dividing into three main categories: mental, spiritual, and physical fighting. Alice

Walker's *The Color Purple* is outstanding for the feminism concern especially the presentation of black women's oppression in the black men dominant society. This article, thus, will analyze women's victory in the feminist angles through their various means of fighting.

2. Objectives

- (1) To examine how black women in the novel of *The Color Purple* are oppressed.
- (2) To explore how black women in the novel of *The Color Purple* fight with men and how they survive in the patriarchal society.

3. (1) Mental Fighting

To investigate mental fighting of female protagonist, Simone de Beauvoir's the theory of the other is used to gain the better understanding of how the female major characters confront with male dominance.

1.1 Mental Fighting

Mental fighting seems to be the best way to fight with men under patriarchal society since men will not be able to know what women are thinking. Additionally, fighting in their head is the safest method for women not to get hurt by men for being hard-headed. The female protagonist chooses writing as the gentlest means to fight with men especially with her stepfather and her husband. Not only Celie but Nettie, her younger sister, also chooses writing as the method to fight with men. Women particularly Celie does not mentally succumb to the male superiority. Apart from writing, their disagreement with the old belief and condemning and criticizing men are the other two ways to overcome the male dominance. These methods above, therefore, will be described respectively.

1.2 Writing to Express Oneself

Black women hardly have voices in the patriarchal society. In this story, there are two women, Celie and Nettie, who employ writing as the way to express their thoughts and feelings. This story is in the form of letter or the epistolary novel that "unfolds the self-discovery of Celie"(Hsiao,2008,p.94). The issue of "voice and silence" is also interested by some critics since they believe that it triggers "female speechlessness" (Cheung, 1988; Abbandonato,1991 as cited in Hsiao, 2008, p. 95). Moreover, the critics praise Walker's "writing techniques". They claim that Celie and Nettie have different types of narrative style. Yet, their distinguish methods accompany each other and "put the story in a larger context" (Fifer, 1985 as cited in Hsiao, 2008, p. 95). Hsiao(2008, p.96) states that Walker's exceptional employment of language builds "new narrative strategies, discloses unheard stories of women, and transforms traditional concepts of gender roles. The manipulation of language empowers the speaker, while failure in voicing causes silence and a lack of control". The bond of sisterhood close the gap between "mother-daughter relationship" (Hopson, 2018, p.1)

Celie, the protagonist, keeps her secrets and shows her thoughts and feelings through her letter writing whereas Nettie shares the stories and experiences including her opinions toward certain things to her sister. Both of them spiritually cling on their writing as the way to escape from the cruel reality and allow themselves to

liberate their mind and thoughts. Celie is sexually abused by her stepfather and is threatened by him not to tell about their affairs to anyone. She, thus, chooses to tell her stories to God via her letters. Celie's self-development is clearly seen through her letters. Her self-development includes exploring her feelings, expanding her knowledge, improving her thoughts, critical thinking, self-confidence, and being independence. The audience is able to perceive Celie's family background from her letters as well. Celie and her sister, Nettie, are the two female characters who use the language to identify their true self.

Writing expands women's knowledge and allows them to exchange information to one another. Celie's correspondence with her sister, Nettie, enhances her perspectives toward the world. Early on she wonders how the world is related to her. Nettie's excitement for seeing the real world excites her sister as well because there are a lot of new things that they both have never been aware of their existence in the world. Nettie shows her sister both good and bad sides of the world. Moreover, Celie knows that oppression is everywhere. She also gains more knowledge about the world according to what Nettie explains in her letters. For Nettie, writing keeps her alive.

Writing gives women freedom and independence. Celie and Nettie retreat to their own areas by writing. In their sphere of writing, they can write, express, criticize anything they want. Furthermore, they are able to exclude men from their writing world since they are a nuisance. At the same time, they can marginalize men in their writing in whatever ways they want. They can be portrayed as the bad, silly and weak men. Their bad behavior can be criticized here. This way, women's tension is released. Writing, hence, makes the female characters happier and it also lead them to be more self-confident.

Writing makes Celie capable of controlling the narration of the story which reveals her power of the controller. She can present the story in any ways she would like to. She can omit some information she does not want to share. For instance, she does not want to mention the male characters, her step-father and her husband by not revealing their real names. She only calls her step-father, Pa, and her husband, Mr. _____. This makes male characters who oppress her less important. Moreover, those men become invisible in Celie's world. Notably, Celie does not conceal every male character's names. She identifies some men's name such as Harpo and Harold. As seen, those men who Celie calls their names are the nice ones who do not try to oppress women. She can choose which story to tell in her own letters. She, thus, creates her own world through her writing, the world in which she is capable of controlling everything according to her points of view. Writing letters for Celie, therefore, is the creation of her own territory outside the cruelty of men's world. Her limited education and her poor writing cannot stop her from expressing herself, and communicating with her sister.

1.3 Disagreeing with the Old Belief that Oppresses Women

Nettie does not follow the Olinka's traditions and attempts to protect her niece, Olivia, from the community's rituals. The Olinka's rituals for giving the scars on the girls' face and the belief that women do not need education are intolerable for Nettie. In her opinion, she thinks that men have no right to do such brutal acts and women have equal rights to men to be clever or to gain the knowledge from education. For her, school is not only for boys but also for girls. She fights with this old belief by insisting on sending her niece, Olivia, to school.

Although Olinka's people completely disagree with her, girls attend school more and more after Olivia's attendance for a while. If Nettie did not dare to violate the Olinka's rules, girls in this village would never be able to be educated at all.

1.4 Mentally Condemning and Criticizing Men

Celie disapproves some of men's unintelligent behavior. Even though she does not show her disapproval explicitly, she silently rebels against men when she discontents with them. She criticizes men's stupid behavior through her letters; she quietly punishes them. For example, she spits in Mr. _____'s brother's glasses for having the bad attitudes toward Shug, the woman she adores. Furthermore, she irritates when Harpo does not listen to her when she tries to convince him not to beat Sophia. She starts to have a little disapproval reaction by having her handkerchief that she gives him to dry his tears back. Sometimes, the audience can see the humor in her narration when she gives the opinions about men's stupidity.

4. (2) Spiritual Fighting

With the exception of mental fighting, spiritual fighting is outstanding in this story as well. The spiritual fighting is categorized into two types: accepting fate optimistically and patiently and strong bond between sisterhoods. To yield the insights of female characters' spiritual fighting, the concept of 'the Other' by Simone de Beauvoir is utilized here.

2.1 Accepting Fate Optimistically and Patiently

Celie still lives her life although she has encountered a great number of problems. She does not surrender to those terrible situations but accept them as if it were the normal circumstances. Some people might think that she is very passive for accepting her fate like that. In reality, she is considered to have a strong mind otherwise she might break down and go crazy for being sexually abused.

2.2 Strong Bond between Sisterhoods

Celie sacrifices herself to her stepfather in order to save her younger sister, Nettie from being harassed. She urges her sister to flee and stay with the missionary couple. Celie does not concern about herself. She can accept the terrible things that will happen to her but she cannot tolerate those horrible things to occur to her sister, Nettie. She is like an angel because she is very protective and sacrificed.

Celie and Nettie have strong belief in their sisterhood. Although Nettie is gone and Celie does not receive any news from her early in the story until the middle of the novel, she still always thinks of her sister. It is clearly seen that man tries to prevent them from connecting to each other. Mr. _____ hides all the letters Nettie send to Celie. Although Celie thinks her sister dies because she has never heard of her, she has never lost faith in the bond of sisterhood. She still has Nettie to spiritually hang on to.

Celie and Nettie's strong faith in each other helps them survive although they have been apart for many years. Besides Shug, Nettie is another person who lifts up Celie because she has the strong belief that her younger sister is still alive throughout these passing years. Nettie also keeps writing to her sister as the only person she can hold on to even though she has never received the reply from her elder sister. The bond is even stronger when

they are eventually able to keep in touch with each other. Celie shares her feelings and thoughts with her sister and also learns the new things from the outside world from Nettie. Nettie is eager to describe what she has seen and learn in the world she has travelled and stayed. They can actually exchange their opinions in some certain situations. Moreover, the hope of seeing each other again is brightening their days.

5. (3) Physical Fighting

Physical fighting is quite obvious in this novel. Women power in this story makes physical fighting possible since they assist one another to find their own identity and places in male superiority. The physical fighting is divided into five groups: convincing men to give women the opportunity, sexual exploration, expressing oneself through one's ability, hitting men to gain more freedom and power, and supporting among black women. To explore the female characters' physical fighting, the theory of the Other by Simone de Beauvoir is scrutinized in the topics below.

3.1 Convincing Men to Give Women the Opportunity

Most female characters are passive and hardly have a chance to express their own feelings. Their freedom is limited under the patriarchal society. Yet, some female characters try to fight for their friends in order to enable them to get the opportunity they are supposed to have. Miss Beasley, Celie's teacher, endeavors to convince Celie's father to let her return to school. Even though Miss Beasley's fighting is unsuccessful, at least she tries her best as the teacher who have the good intention to her student. Besides Miss Beasley's attempt, Nettie also fights to get her niece to go to school at the Olinka's community. In this community, women are obviously under men's control. Men see no need for women to get the education because women's duties are at home doing their house works. Nettie does not succumb to this rule. She insists on urging her niece to go to school. At first her niece has to struggle with the unaccepted reaction from male students. Later on, Olinka girls are allowed to go to school like boys. If Nettie does not fight for her niece's education at first, other Olinka girls would not get this opportunity either. Nettie, thus, does not only fight for her niece but also for all the Olinka's girls. According to Maria Stewart (1987 as cited in Collins, 2000, p.2), she urges black women to gain knowledge as the way to gain their power: "Turn your attention to knowledge and improvement; for knowledge is power". Notably, black male characters prohibit women from being educated so that they will remain ignorant and silent.

Additionally, Mary Agnes or Squeak attempts to plead the police officer to release Sophia from jail. Unfortunately, she does not succeed in imploring but she is raped by the police instead. As seen, Mary shows her spirit and sacrifices herself for helping Sophia. After doing such brave thing, Mary does not want to be called Squeak anymore. She feels that she is more visible since she does something meaningful. She has scarified herself to help Sophia. She, then, reveals her true name to everyone. Name is very important for one to be recognized and be visible. She, therefore, is proud of herself and is proud by being acknowledged as her real name, Mary Agnes.

3.2 Sexual Exploration

Sexual exploration increases the understanding about women's own bodies and also realizes the true sexual pleasure. As seen from earlier, Celie is a sexual object who is abused by her stepfather and her husband. She confesses to Shug that she has never gained sexual pleasure while having sexual intercourse with both of them. With her stepfather, she is too young to know what happens to her. What she only knows is there is pain after having sex. With her husband, however, she still does not receive any pleasure from sleeping with him since he does not seem to care at all about how she feels. Celie, hence, sees sexual activities as the terrible things and has never realized that she herself can gain sexual pleasure. Fortunately, Shug is the one who introduces sexual pleasure to Celie. Shug opens the whole new world to Celie that women have the right to be happy with sexual activities. Celie learns sexual experiences with woman and she is happy to admit that she likes woman instead of man. This is another step of her development. She realizes her own desire and she dares to deny man. Sex between women and women threatens men since men are not needed anymore. They are excluded from women's sexual relationship which lowers their self-esteem since they always perceive themselves as the center of the world with the phallocentrism. Their penis is the most powerful tools for them. Women and women sexual relationship here is like they slap on men's face because their penis cannot satisfy women.

Here, woman's power expands its territory. When her ex-husband asks her to reunite with him, Celie denies and announces that she does not like men. At that time, her ex-husband, Mr. _____ becomes a better man: he is nicer to women and does a lot of men's work in the field. Notably, men's power gradually decreases while women's keeps rising. Actually, the lesbianism means more than just the relationship between woman and woman. In fact, women's power increases when they are together especially when the power of love, empathy and support are bound together. Moreover, women's denial of men signifies the collapse of phallocentrism. Women can live on their own. They do not have to depend on men in all aspects including love, sex, spiritual and financial support.

3.3 Expressing Oneself through One's Ability

Women feels self-worth after being aware of their own ability and that ability can turn into their own business. As seen in the story, many female characters have the special talents and abilities. Shug is very good at singing and she can earn her living by being a singer. She can live the luxurious life from her singing talent. Mary Agnes who also loves singing finally decides to become a singer. Celie excels in sewing. She sews for Shug and other female friends. She eventually has her own clothes business. Having her own business leads Celie to be both physically and financially independent. Earning one's own money is very crucial for black women at that time since it reminds them of their self-esteem and self-worth. Men in these stories look down on women and think women are the depending creatures rather than the dependable ones. Most female characters, however, can prove to men that they can stand on their own. They can step out of men's territories.

3.4 Hitting Men to Gain More Freedom and Power

Showing women's physical power by beating men is Sophia's way of fighting. She is considered a very strong woman from her physical appearance. Her behavior is masculine. She can do the labor tasks like men. She hits men. Nevertheless, she seems to be the only woman in this book who dares to have the physical fighting with men. She tells Celie that she has to fight with men in her family to survive. Notably, both Celie and Sophia are under male authority but Celie does not seem to gather her courage to physically fight with men. By contrast, Sophia is brave enough to physically fight for herself despite getting hurt. Sophia fights with her husband and the mayor. As seen in the story, her physical strength really upset her husband, Harpo. He wonders why his wife does not behave like other women. He also attempts to gain the power back by hitting her but she fights back. Harpo is not successful in beating Sophia. After having the fight for a while, Sophia decides to leave him. It, however, shows that it is not really wise for women to have the physical fighting with men due to men's more physical strength. In this case, Sophia fights with the mayor and she has to be put in jail. In prison, she learns that physical fighting cannot gain her victory. She learns to be quiet and do what she has been told. Here, she sees Celie as the good example of accepting one's own fate. Celie's quietness, however, is another form of fighting. If she is not spiritually strong enough, she will never be able to survive in her cruel world. Sophia is, thus, the representative of woman who does not surrender to men's authority. Moreover, woman who possesses masculine characteristics like Sophia intimidates men. Even though Sophia does not gain the true victory from physical fighting, at least she lets men know that they cannot just beat the strong woman like her. At least they are frightened of her. Celie also stands up for herself.

3.5 Supporting among Black Women

Black female characters in this story support one another throughout the story. Weak and passive female characters gain more confidence after receiving the support from stronger female friends. Celie's great changes and self-development are from Shug's influence and support. She firstly experiences sexual pleasure through Shug's sex education. Shug also urges her to find the truth about her real father. The most important thing is Shug's helping to find her ability of sewing and helping her establish the panting business. Shug is the crucial person who makes Celie feel that she exists in this world. She has self-worth and become visible through Shug's assistance.

Apart from helping Celie find her true self, Shug assists Mary Agnes to find her identity as well. She gains self-confidence and finds what she really wants to do in life by getting the inspiration from Shug's singing. She has a chance to sing in Harpo's bar and she realizes she likes it. Consequently, she finally announces that she will go to Memphis with Shug to be a singer. Harpo as her husband is angry and does not accept her decision. Yet, he cannot win over her strong determination in desiring to be a singer. He, finally, let her leave unwillingly.

Furthermore, women's conversations allow them to know, understand and empathize with one another's stories. The conversation between Celie and Sophia broadens their understanding from each other. At first, Celie suggests Harpo to beat Sophia out of her jealousy. Meanwhile, Sophia is very angry with Celie for urging Harpo

to beat her. They both, however, understand each other after they have conversations. Celie learns that Sophia's physical strength and bravery arrive from her fighting with men in her family. Finally, their reconciliation derives from the empathy they have with each other after hearing how much Sophia has to fight under male superiority in her family and how Celie's submissiveness turn her to be a quiet and heartless girl. Their conversations lead them to the unity.

Aside from having conversations with one another, making quilt is the result of women's power. Besides gathering together to share their lives, making quilt symbolizes women's unity since quilt is made from various pieces of cloth. It is referred to female characters in this story that come from different background but their gathering strengthens women's power in the gentle way and quilt is also the symbol of women's harmony.

Making quilts also strengthen women's power. Quilts symbolize the diversities of black female characters in this story. They all come from different places and different background. Yet, there is the similarity in those differences. They all suffer from male authority. Although quilts are made from various pieces of cloth, they are sewed together to make the entire quilt. This illustrates female characters' integrity. Their assembling gains themselves more power since they are in the realm of women. They can share their happiness and sadness, they can criticize men, they can express any kind of opinions, and they can express their creativity in making quilts. Making quilts, therefore, is tremendously meaningful to female characters. Celie also helps other black women to get the jobs by hiring them to work for her panting business. She helps women to be able to stand on their own.

6. Conclusion

There are both strong and weak women in this story. So when they gather together, they learn something from one another. Weak female characters learn how to be strong by those strong ones whereas the strong ones can console and encourage the weak ones to live up for themselves.

Female characters in *The Color Purple* are invisible and worthless in the eyes of men. Yet, these women gradually make themselves visible and worthwhile. They do not surrender to their fate. They hardly use violence to gain their victory. Their power becomes stronger and stronger because they focus on helping, listening, sharing and encouraging one another. These activities increase their immunities toward the patriarchy. Their sincerity leads them to self-development which arises from the strength of women's support to one another. They console and give one another chances until their voices are heard. Their victory comes from the strength not to give up, and the supports that make them find their true self. This victory, thus, does not end with blood nor violence but with happiness. Women's power in this story makes themselves exist in the society. Men can see their potential and talents whether men like it or not.

Black women's fighting in this story liberates them from male restraints. They finally find their own path without relying on men anymore. Consequently, women gain their identity at last because they can change from being 'Other' to being 'Someone' in the patriarchy. They make male characters become marginalized. The status of male and female characters is reversed here. Female characters support one another which lead to

strength and unity to form their own identities and step out from the confinement and oppression. On the contrary, men are marginalized and considered as “the Other” instead.

7. Suggestions

The examination of black women in the film of *The Color Purple* should be analyzed and the comparative study of black women’s presentation in both novels and films should be investigated as well.

8. References

- Collins, P. H. (2000). *Black Feminist: Knowledge, Consciousness, and the Politics of Empowerment*. New York, NY: Routledge.
- Hopson, C. R. (2018). “Tell nobody but God”: Reading mothers, sisters, and ‘the father’ in Alice walker’s the color purple. *Gender and Women’s Studies*, 1(1), 1-15.
- Hsiao, P. (2008). Language, gender, and power in the color purple: theories and approaches. *Feng Chia Journal of Humanities and Social Sciences*, 17, 93-120.
- Pilcher, J. & Whelehan, I. (2017). *Key concepts in gender studies* (2nd ed.). London, UK: Sage Publications Ltd.
- Scholz, S. (2010). *Feminism: A beginner’s guide*. London, UK: Oneworld Publications.
- Walker, A. (2003). *The Color Purple*. Orlando, Florida: A Harvest Book Harcourt, INC.

THE RE-EMERGENCE OF ALTER EGO IN THE NOVEL OF *FIGHT CLUB*

Aphiradi Suphap

Department of Western Languages, Faculty of Humanities and Social Societies,

Thaksin University

E-mail: carpedium78@gmail.com

ABSTRACT

This academic article intends to investigate the period of time that the protagonist's alter-ego appears throughout the story since his alter ego has the important role in the protagonist's self-development. Sigmund Freud's psyche theory is applied to explore when the narrator's id emerges and what it does when it appears. Additionally, masculinity theory is also employed to examine the narrator's male identity crisis since it is one of the causes that the narrator let his dark side appear. The re-emergence of the narrator's alter ego reappears in four different reasons: discontented with consumer culture, the lack of masculine identity, finding life is boring, and incapable of interacting with women. Although the narrator has learned so many new and daring experiences from his id or alter ego, he realizes at the end that if he lets his id lead his entire life, his life will be devastated.

Keywords: *Fight Club*, alter ego, id, dark side, masculinity, male identity crisis, Chuck Palahniuk

1. Introduction

Fight Club was written by Chuck Palahniuk in 1996. Its theme and presentation techniques of alter ego or dark side are very prominent. Palahniuk demonstrates the narrator's alter ego through another character, Tyler Durden. Tyler becomes the narrator's best friend and role model in making his life more colorful and meaningful. The author can distract the audience's attention from thinking that Tyler is the narrator's alter ego or dark side. Most significantly, the protagonist is also not aware that his best friend does not truly exist. He does not realize that Tyler is only his imaginary friend whom he creates his personalities the way he wants to be but cannot be like that in his real life. The technique of surrealism is prominently used to present the protagonist's dark side. Undoubtedly, Tyler's characteristics are completely opposite from the protagonist's: the narrator is unadventurous whereas Tyler is daring. The narrator, is, thus, amazed by Tyler's audacious behavior and adores him for his boldness. The emergence of the narrator's alter ego or his dark side as his imaginary friend, Tyler, is obviously related to the narrator's psychological problems. Consequently, Tyler appears to rescue the narrator from despair. Obviously, what Tyler introduces the narrator to do is considered misbehaved or socially unacceptable. Since the narrator cannot find happiness from social patterns, he, therefore, escapes to find pleasure from what his Id offers him to do. The narrator has been introduced to various adventurous and outrageous activities by Tyler throughout the story. Almost at the end of the story, the narrator realizes that Tyler is not his

friend but it is himself. After that he tries to stop all the mischief that Tyler plans to do. Tyler is the narrator's Id coming to life.

Tyler represents everything the narrator wants to be and wants to do but he cannot do in his real life. This academic paper will examine when the narrator's alter ego appears throughout the story.

Psupito and Widyaningrum (2020, pp. 3-4) employ psychoanalysis to analyze the narrator's mind. They state that the narrator encounters two types of anxiety: Generalized Anxiety Disorder (GAD) and Obsessive-Compulsive Disorder (OCD). The first type associates with the narrator's insomnia symptom. They remark that "people with Generalized Anxiety Disorder (GAD) can be very agitated even if they are not in a tense situation, even if they are fine". The latter is related to more complicated symptoms such as panic disorder or phobia. In *Fight Club* novel, the narrator is repressed by social values of materialism. He has to purchase commodities to make his life luxurious.

Psupito and Widyaningrum (2020, pp.3-4) also claim that the narrator struggles with two types of ego defense: displacement and reaction formation. According to Psupito and Widyaningrum (2020, p.2), ego defense mechanism is "an unconscious psychological process that helps a person overcome anxiety due to a stressful internal or external environment. When anxiety is so overwhelming, the ego tries to defend itself and unconsciously the ego will survive by blocking all impulses or by changing those drives into more acceptable forms". The displacement happens when the id desires to do something that the superego does not allow. The ego, thus, attempts to find the other way to let the id "release the psychic energy of the Id". For example, the narrator "really hates his boss because of poor treatment of him" (Psupito and Widyaningrum, 2020, p.4). However, Psupito and Widyaningrum do not give the clear explanation of the situations in the story that is related to the displacement. Apart from the displacement, the protagonist also encounters with the reaction reformation. It is the action when one does something that is opposite from what one feels or says. For example, the narrator is very upset that Marla attends support groups with the same reasons with him of searching for something to fulfill their lives (Psupito and Widyaningrum, 2020, p.4).

With the exception of psychoanalysis, masculinity is another crucial issue which is portrayed in *Fight Club*. The protagonist does not acquire masculine characteristics. Looking for masculinity is, therefore, one of the main processes that are in progress throughout the story. Brissey (2017,p.9) states that *Fight Club* was published around the time that there was "the outcry of masculine crisis". Brissey (2017, p.9) even remarks that "the novel demonstrates a progression toward authentic masculine identity, which here can be understood as a move away from prescriptive gender performance in a favor of a more malleable interpretation of masculinity, or more specifically, an identity construction which defies the notion of a stable masculine subject". The protagonist in *Fight Club* encounters male identity crisis.

This academic article intends to examine when and in what kinds of situations that the narrator's alter-ego, Tyler Durden, emerges throughout the story. The reasons of his alter-ego's re-emergence is described and respectively categorized into four topics: discontented with consumer culture, lack masculine identity, finding life is boring and incapable of interacting with women. Even though the topics of psychoanalysis and masculine

crisis have been discussed in journals and theses, there is no clear examination about when the protagonist's alter-ego will appear in the story. This investigation, thus, will apply Sigmund Freud's human psyche theory and masculine theory to explore when the main character's alter-ego will emerge throughout the story.

Theoretical Framework

The re-emergence of the narrator's alter ego is prominent in *Fight Club*. It re-emerges so often throughout the story that distracts the audience as another major character. As a result, the psyche's theory of Sigmund Freud is examined to analyze the protagonist, the narrator's mind. Sigmund Freud was the well-known psychiatrist that explored human's minds and gave the clear depiction of how human's psyche functions. According to Freud, the psyche consists of three parts: the ego, the id and the superego.

Human's Psyche

Besides being a psychiatrist, Freud was also interested in psychoanalysis. Early in his life, he divided the structure of human's mind into two main categories: the conscious and the unconscious mind. The conscious part consists of the realization of one's "thoughts and actions". Here, "the logical thinking, reality and civilized behavior" is the cornerstone of the conscious mind. On the contrary, the unconscious mind is the repressed part of one's mind which hides all the unpleasant thoughts, feelings and situations. After exploring this theory for a while, he added that human's psyche comprised the preconscious as the place between the conscious and unconscious mind. Freud addressed that this portion of mind kept the information that was long forgotten but could still be recalled (Snowden, 2017, p.71).

1. The Theory of the Unconscious

The unconscious mind is where the "primitive instinctive urges" have to be kept so that it will not bring chaos to the society since it operates according to its impulse without caring about the social rules. It will do whatever it wants at any time. This desire can be organized into two groups: Eros (the life instinct) and Thanatos (the death instinct) (Snowden, 2017, pp. 72-73). Eros or the life instinct is "the basic source of all drives concerned with self-preservation and enjoyment" (Snowden, 2017, p.184). It also "concern[s] with the survival of the species and is responsible for sexual and reproductive behavior" whereas Thanatos or the death instinct is related to self-destruction. This results in all the negative manners which will mainly be expressed in the aggressive way. All the deviant behavior intends to relieve the stress (Snowden, 2017, p. 142). Freud (Snowden, 2017, p. 142) remarks that "the aim of all life is death, a state where there are no tensions at all because no stimuli can impinge from within or without to disturb the everlasting peace".

2. Freud's Theory of Psyche

When Freud furthered his study about human's psyche, he developed his theory of psyche into the new model of the mind. He pointed out that human's mind consists of three main parts: the ego, the id and the superego as follows:

The Ego

The ego comes from the Latin word which means "I". It, thus, means "self". It demonstrates consciousness (Storr, 2001, p. 61). Its duty is to communicate with the external world or the reality. Moreover, it is where the consciousness lies. It will, therefore, do its best to correct one's mind and behavior. This part of the mind tries to be "practical and rational". It includes decision making as well. Even though it is organized and reasonable, it seems to be weak comparing to the id. The ego is, however, in control most of the time. If the anxiety happens, it means there is a warning that "there is a weakness somewhere in the ego's defenses" (Snowden, 2017, pp. 126-127).

The Id

The id was deprived of the Latin word. It comprises "the primitive, unconscious part of the mind that we are born with". This part is regarded as "a dark, inaccessible area, seething with instinctive urges and its only reality is its own selfish needs". The id has no logic. It contains only its desire. It cannot make any kind of judgment. It, hence, does not care whether its feelings are right or wrong. As a result, "it is completely amoral" (Snowden, 2017, pp. 126-127). Consequently, this part of human's mind is very dangerous. If it is not controlled, it will bring disorder to one's life.

The Superego

The superego is the part where it judges one's behavior. It involves "the sense of right or wrong, pride and guilt". It will observe one's behavior and tell him or her if his/her action is wrong. This area will not allow one to do the unacceptable actions that are against social rules or morality. It will support the ego to do the good and acceptable deeds to achieve the perfection. It, thus, acts as "the inner parent" (Snowden, 2017, pp. 128-129) or the inner police.

Masculinity

Masculinity is "the set of social practices and cultural representations associated with being a man" (Pilcher and Whelehan, 2004, p. 2). According to Sawyer (2004, pp. 25-26), he believes that not only women but men also have "sex roles stereotypes". To be successful, men should play the dominant roles which are often related to women. Society, therefore, has the great impact on men's "sex roles stereotypes". Social values give the perception of men as the dominant and women as the submissive. Additionally, advertising and consumerism influence how men and women should be like. To possess the manly characteristics, men are socially forced to "buy cigarettes, clothes, and cars". At the same time, women also need to look "feminine" by consuming and owning clothes, and accessories that will help them achieve the feminine look. In reality, not every man can be successful at this point. As a result, those who cannot acquire those qualities will be "the object of jokes, scorn, and sympathy from wives, peers, and society generally". As seen, men are burdened by the social values.

According to Sawyer (2004, pp. 25-26), men have been struggling with “the sex-role stereotypes” for so long that it deprives them from being who they truly are. Society shapes and forms how men should be and act to reach their success. Men’s images that the society constructs are too ideal to achieve. Moreover, social rules teach men to be superior to women whereas teaching women to be submissive. Due to social values, gaining success for being masculine means that men have to have the impact on other people including women and other men in “the occupational world”. As a result, men who fail to possess these qualities will be condemned as “the object of jokes, scorn, and sympathy from wives, peers, and society generally”. Cornell (2005, p. 65) adds more definitions for being masculine by characterizing masculinity as “risk-taking, responsibility, irresponsibility, aggression”. Furthermore, Lionel Tiger (cited in Cornell, 2005, p. 65) states that men have to encounter “hard and heavy phenomena” to become “true maleness”. As seen, men are fully expected from society which causes men to suffer from male identity crisis. The nameless narrator in Palahniuk’s *Fight Club* is the great example for a man who is not qualified with the definition of masculinity that the society acquires.

2. Objectives

(1) To examine when the protagonist cannot control his id through the emergence of his alter-ego, Tyler Durden.

(2) To explore how the protagonist encounters with his male identity crisis.

3. (1) Discontented with Consumer Culture

The narrator looks for his alter ego, Tyler, to bring him out of the consumerism since he is aware that it cannot fulfill his emptiness. His alter ego, therefore, appears to bring the narrator out of the materialism and find the happiness that does not depend on any commodities. Although the narrator seems to be happy with his materialistic lifestyle, he is still empty and lacks the meaning in life. Early in the story, the narrator boasts about his furniture that he decorates his room: “We all have the same Johanneshov armchair in the Strinne green stripe pattern. Mine fell fifteen stories, burning, into a fountain.

We all have the same RIsampa/Har paper lamps made from wire and environmentally friendly unbleached paper...” (Palahniuk, 1996,p.43)

Yet, these materials cannot cure his insomnia. He is both mentally and physically tortured by insomnia. After his condominium is exploded, he tries to find Tyler. Actually, the narrator’s Id leads him to explode his own apartment. His apartment and all the commodities in it represents materialistic world that makes the narrator discontented. His Id or Tyler intends to destroy them to set the narrator free from the consumerism. Exploding his apartment signifies his desire to eradicate consumerism. Yet, such an action is not enough to deliver him from his depression. Tyler also introduces him to the world where happiness does not depend on materials by taking the narrator to live with him in the devastated house in the suburb. Since the narrator is not content with materialistic world, his alter-ego or his Id, attempts every way to rebel against it so that he will not be enslaved

in this kind of society anymore. Undoubtedly, all the mischief the narrator's alter-ego has done is associated to destroying civilization.

Besides introducing the narrator to the down to earth lifestyle, Tyler also leads him to rebel against social patterns. This reveals that the narrator's superego cannot suppress Id anymore. As a result, his Id emerges by acting against consumer culture. Tyler does not care about materialism at all. He does not own any commodities. He does not even own the house. The narrator's Id does not only want to destroy consumer culture but he also wants to eliminate the entire civilizations. For him, civilizations are just the illusion. They do not develop human's minds at all. On the contrary, it causes chaos instead. People live in the world where they adore materials.

4. (2) The Lack of Masculine Identity

The narrator struggles with male identity crisis because his characteristics do not possess the ideal men and masculinity that the society requires men to be. Furthermore, he is angry with himself for not being able to be like what the society expects him to be. The narrator is, therefore, bored with his gentle characteristic that has no adventurous activities at all. He, therefore, unconsciously lets his Id guide him to be more masculine. In the sense of being masculine, the aggressiveness and violence is the main key to meet the narrator's satisfaction and gain self-esteem as a man. The narrator's Thanatos emergence is fully seen in this story. The narrator is an example of a man who does not possess the masculinity according to what society sets up what the suitable masculinity should be like: strong, brave, etc. He, therefore, looks for the ways to change himself to be more masculine. He has been repressed with this set of social values for men for a long time that his Id cannot be suppressed anymore. His unconscious mind invents his own type of masculinity which becomes much more than just having strength and bravery. His ideal man is, hence, completely different from whom he naturally is. Tyler Durden, his alter ego, has daring personality which leads the narrator to do so many outrageous activities that he has never experienced before. For him, being a real man has to involve with using aggressiveness and violence. Thanatos or death instinct, is, thus, clearly seen in his search for masculinity.

The narrator's alter-ego, Tyler, introduces him to death instinct that emerges in the form of self-destruction. His alter ego or his dark side, Tyler, presents fight club and Project Mayhem as the way to gain masculinity. Joining fight club makes the narrator become visible since he is the leader of the club and every club member cherishes him. Here he makes his own rules and every club member willingly accepts them.

In the club, fighting is the main activity. Everyone who attends the club has to be in the fight. The narrator's alter ego creates male sphere where women are excluded. The narrator does not have the good relationship with women especially with Marla. The conflict between the narrator and Marla will be discussed later on in the topic of his incapability to interact with women. In fight club, violence is the way to express the narrator's masculinity. With violence, he can release his tension and show his strength and bravery that he can never do in his normal life. As narrated in the story, men who attend fight club even the narrator himself are not the same people outside the club. The club members are very contented to join it since they can express the other

side of them that they cannot show them anywhere else: “Who guys are in fight club is not who they are in the real world. Even if you told the kid in the copy center that he had a good fight, you wouldn’t be talking to the same man” (Palahniuk, 1997, p.49). As a result, the narrator becomes alive like he has never been before: “After a night in fight club, everything in the real world gets the volume turned down. Nothing can piss you off. Your word is law, and if other people break that law or question you, even that doesn’t piss you off” (Palahniuk, 1997, p. 49). It seems like establishing and joining fight club enlighten his entire life.

His behavior after fighting with men is completely distinctive. He drastically changes from the neat man to the one who is proud to go to work with the bruise, blues and scars all over his face and wear the dirty shirt to work. He is even prouder because he is the founder of the club. Although he is not aware of it, his life becomes more colorful and meaningful. Additionally, this activity is hinted by the author that it is emerged from the narrator’s Id. Fight club only happens at nighttime which signifies that this activity is done secretly and unconsciously since the nighttime represents secrecy and people’s minds often wander at night. Consequently, aggressiveness and violence are the means to be masculine for the narrator.

Notably, Tyler asks the narrator to hit him after he wants Tyler to rescue him from being trapped in the consumer world. Fight club starts with the narrator’s fighting with Tyler. Apparently, the narrator seems to be very contented after the first fight. He seems to let things go. He does not concern about any kinds of materials anymore. Furthermore, he does not even wear the clean clothes to work. The pain he gets from fighting brings him the bravery since other men gradually join the fight club and adores him as their hero. As seen, pain, aggressiveness and violence makes the narrator visible and accepted among men. These situations have never occurred to him before. As a result, the narrator sees fighting as the way to release the tension and gain respect from others. The narrator and other fight club members think that having scars and blues all over their faces give them the sense of being stronger. The capability of enduring pain represents the sense of being masculine that they cannot get in reality.

The protagonist goes beyond the limitation by inventing Project Mayhem which aims to destroy civilization. This activity intends to eliminate social norms that people have been following for a long time. The narrator narrates that Tyler is the one who establishes Project Mayhem. Tyler will assign the jobs for the members to do each night to violate public rules and destroy materials and demolish the building.

5. (3) Finding Life is Boring

The narrator life is so boring that he needs Tyler or his alter-ego to bring him out of it. Following social patterns does not make the narrator’s life any better. He is bored and finds his life meaningless. Rebelling against the social patterns is, hence, the key that Tyler offers to the narrator. He introduces the narrator to another part of life that he has never experienced before. The narrator totally changes from the neat office man to the dirty one. He goes to work with dirty shirts. He blackmails his boss, gets paid a lot and finally gets fired. As seen, he is so happy that he has done such actions. He feels that his life starts to be liberated. After resigning from his routine job, he does not seem to regret it. Tyler introduces the narrator to the new jobs. Tyler has done a few different

jobs: a film projectionist, a waiter and a soap seller. Notably, he will do the outrageous thing in every job he does. He put the sex scenes into the Walt Disney films, urinates into the soup he serves, and makes the soap with the liposuction fat and sells it to the department store. The narrator does not seem to think of his old job at all. In fact, he is excited with the new jobs Tyler offers to him. As a result, Tyler takes the narrator to another world where social rules are not important anymore. Being with Tyler makes him able to take a revenge to the social norms that has been discomfited him all of his life.

6. (4) Incapable of Interacting with Woman

Remarkably, the narrator does not have the good relationship with women. He, therefore, needs help to build relationship from his alter ego, Tyler, to fill the gap between him and woman. He is seen to be around with only men. The appearance of Marla, however, truly upsets him since he does not know how to interact with women. Yet, the interaction is not the only reason that makes the narrator does not like Marla. The important cause is that Marla possesses the daring personalities that he does not have at all. Marla is the type of woman who has nothing to lose. She is jobless. She steals clothes from the Laundromat. She dares to participate in the testicle cancer support group where men share their sufferings. Her provocative action intensely irritates the narrator and emphasizes his cowardice. Her mischievous action is reinforced when she dares to be only one woman in the testicle cancer group. The narrator is very upset because she intrudes into his comfort zone that he has just discovered. She also reflects the narrator's flaws and weakness.

The narrator is very happy in attending the testicle cancer support group since men who are there also encounter the lack of male identity. Testicle cancer signifies men's weakness and the lack of male power since male sexual organ is considered as the symbol of men's ultimate power. The narrator is not alone anymore. He has many men who are in the worse conditions than him. Most importantly, his insomnia is cured when Big Bob hugs him. Bob has big chest like woman. And this characteristic leads the narrator to feel that he is embraced by his mother's warmth. As a result, the appearance of wicked Marla destroys his peaceful and precious moments. Marla attends various support groups like the narrator. Even though her main reason is to get free food which is different from him, the narrator is not content seeing her joining the same support groups with him. Going to support groups makes Marla see his fragility. Consequently, he needs his alter ego to fight with Marla.

With Tyler, Marla is treated as sexual object. She is needed when Tyler wants to have sex with her. Other than that, he does not really care about her at all. Marla is reinforced as the victim when she has no clues that Tyler is the narrator's alter ego. She realizes that she has been with the narrator. As a result, she is confused when the narrator does not want her near him after having sexual intercourse with her.

6. Conclusion

Generally, human's dark side or the Id is regarded as the undesirable part where it should be deeply hidden. In *Fight Club*, however, the Id plays the important roles in the protagonist's life and is not secretly kept at all. It, however, does not reveal the immoral actions but just some rebellious behavior to make the protagonist

regain his self-esteem and self-worth. Furthermore, his Id also gives the audience some thoughts about how disruptive our society is and suggests that we as humans should reconsider our true happiness and social patterns. The author makes the audience wonder if we humans are really happy with the social rules that we have to follow and some social values that we enslave with. Yet, Chuck Palahniuk, still demonstrates that humans cannot let their Id run wild. If the Id goes to the extreme, it will bring troubles to both the self and others. The narrator creates his alter-ego because his repression and unconsciousness cannot be suppressed anymore. They want to emerge and do as they wish. As a result, the narrator creates his imaginary friend whose characteristics are totally opposite from him. The narrator is restrained by social norms and patterns which are hard to break free. He, therefore, invents a person he wishes he could be. Although he has learned so many exciting activities and life lessons from his id, Tyler, the narrator, finally realizes that he cannot let his id lead his entire life. If he lets his id lead his life too much, it will ruin his life.

7. Suggestions

Psychoanalysis and gender studies should be explored more in Chuck Palahniuk's other novels such as *Beautiful You*, *Choke*, and *Invisible Monster*.

8. References

- Brissey, R Jr. (2017). *Marked: Masculine Performativity in Chuck Palahniuk's Fight Club and Bret Easton Ellis' American Psycho*. (Unpublished master's thesis). Clemson University, South Carolina, United States of America.
- Cornell, R.W. (2005). *Masculinities* (2nd ed.). Berkeley: University of California Press.
- Palahniuk, Chuck. (1997). *Fight Club*. New York: An Owl Book.
- Pilcher, Jane and Whelehan, Imelda. (2004). *50 Keys Concepts in Gender Studies*. London: SAGE Publications.
- Puspito, A. and Widyaningrum, A. (2020). Ego Defense Mechanism of the Main Character in Fight Club Novel (1996): Psychoanalytic Study. *Dinamika Bahasa Dan Budaya*, 15(1), 1-6.
<https://doi.org/10.35315/bb.v15i1.7889>
- Sawyer, Jack. 2004. On Male Liberation. In Murphy, Peter F (Ed.), *Oxford Readings in Feminism: Feminism & Masculinities*(pp.25-26). Oxford: Oxford University Press.
- Snowden, Ruth. (2017). *Freud: The Key Ideas*. London: John Murray Learning.

THE FINNISH EDUCATION QUALITY MANAGEMENT

Subin Yurarach

Research Facilitation and Development Center, Sripatum University

E-mail: subin.yu@spu.ac.th

Panwasa Smith

Doctor of Philosophy Program in Educational Administration, Sripatum University

E-mail: panwasa.smi@spulive.net

Pakawat Smith

Doctor of Philosophy Program in Educational Administration, Sripatum University

E-mail: pakawat.smt@spulive.net

ABSTRACT

Finnish education reform strongly pushed forward in the 1990s, a high-quality education system is the result of effective social education policies. The focus of the Finnish government on ensuring that all schools across the country have a unified curriculum. And there is a policy of equality as the core of education reform, especially the welfare of the state, which provides Finnish citizens at all levels of education free of charge. Finland has established a comprehensive education reform standard, including the measurement of teacher teaching, equality of education based on humanitarian principles and develop education as a tool to improve people's livelihoods. It is the implementation of the learning method called Active Learning for 21st Century Skills with the goal of educational outcomes as follows: possessing analytical thinking, innovative thinking, collaboration and leadership, communication and media literacy skills, cross-cultural understanding and thought processes, technology use and literacy skills, technical skills for career and learning, and morality and discipline.

The success factors of Finland's education reform, according to Wallin (2018) are: equality and education of the people, equality and fairness in society, teacher's values, relaxing environment, public service, and attributes of the Finns.

The aim of today's education is not focused on scoring competitions or numerical metrics like in the past. But to prepare students for global citizenship; to develop students to be citizens who focus on fairness in society. An effective Justice-Oriented Citizen requires an opportunity to analyze and engage with society, economy, and politics to see injustice and the importance of seeking justice in society. Finnish education is not only a quality education system for young people and people in society but also affects the development of the country to be better in all aspects, such as a globally competitive economy, very low corruption, population well-being, and have a sustainable quality lifestyle.

The suggestion for academic purpose is that, there should be a comparative research study on the Thai and Finnish education systems and propose an alternative education model for Thailand. And the suggestion for educational institution administration is that, educational institutions are able to adapt the Finnish approach to educational management in accordance with the educational management philosophy of the educational establishments.

Keywords: Quality Management / Educational Quality / Progressivism / sustainable development

1. Introduction

When referring to an educational system that is recognized for both curriculum management and educational achievement, Finland is the top country that will immediately appear. The reason why Finland is more accepted than the education system from other countries is because Finland requires teachers to have a master's degree in order to get a teaching license since 1975. After that, the Finnish education system has reformed the national core curriculum of basic education. Wallin (2018) said; since 1985, the results of the assessment of scientific knowledge, math knowledge, and reading literacy according to the Program for International Student Assessment (PISA) were better than the developed countries. Finnish principles of thinking to reduce the amount of time spent in school, less homework, and less exams. It can enable students to develop themselves more than studying with long hours of study.

Education is an important tool for human development and national development. In order to reform the country, it must first begin with education reform (Areekul, 2016). Finnish education reform has been strongly pushed forward in the 1990s, a high-quality education system is the result of effective social education policies. Which is an implementation of the learning method called Active Learning for 21st Century Skills, emphasizing teaching and learning to build skills without using content from the course as a set but apply learning through experience. One method that is gaining popularity is organizing learning activities through the STEM approach (STEM: Science, Technology, Engineering, Management), which is a teaching and learning approach that integrates science, engineering technology, and mathematics at all levels from kindergarten to vocational and higher education without focusing only on memorizing scientific formulas or theories or mathematical equations alone. But learning STEM will train learners to learn how to think, ask questions, solve problems, and build new research and analysis skills. It helps learners know how to apply scientific and mathematical knowledge in various fields by integrating knowledge together to focus on solving important problems that may occur in daily life.

Finland sees plans to use education as a human resource development tool to create the competitive potential of the country which is the most important political policy in Finland. Today, the Finnish educational development model has become an important export product of the country, which is widely recognized and accepted all over the world. From past to present, Finland has been named a "Country with Design" in its pedigree. In 2012, Helsinki, the capital of Finland was selected by the International Industrial Design Association as the World Design Capital. Design is a science that emphasizes the use of thought processes, thus affecting the balance

for Finland be able to create one of the best education and research systems in the world. The focus of the Finnish government on ensuring that all schools across the country have a unified curriculum. And there is a policy of equality as the core of education reform, especially the welfare of the state which provides Finnish citizens at all levels of education free of charge. Compulsory Education, the 9-year system for students aged 7-16 in public schools also provides free lunches for students. Finland has established a comprehensive education reform standard, including the measurement of teacher teaching, equality of education based on humanitarian principles, and develop education as an important tool to improve people's livelihoods.

2. Finnish Curriculum Management

Finnish education we are interested in and we may not fully understand why this country's education system is so outstanding. It has become a model of education that many countries have adopted along with their own education systems even Thailand. According to the Organization for Economic Co-operation and Development (OECD-PISA) Educational Achievement Test (OECD-PISA), Finland's 15-year-old students scored the highest in reading and science proficiency, ranked second in mathematics and solutions are ranked high in three major fields, as are students from South Korea and Singapore. Thanalertsomboon (2020) stated in an article of the Education Equality Fund, the World Economic Forum and the independent organization called NJ MED (New Jersey Minority Educational Development) that Finland is hailed as the best educated country in the world with population statistics over 15 years or age who can read 100% and most of the population statistics speak more than one language such as Swedish, English, German, etc.

In 2005, the European Community Commission proposed the skills and competencies necessary for life-long learning. And it was presented to all member states in 2016 by the Parliament and the Council of Europe. This principle has been applied in Thailand's education reform plan as well, which are;

1. Critical Thinking and Problem Solving
2. Creativity and Innovation
3. Collaboration Teamwork and Leadership
4. Communication Information and Media Literacy
5. Cross-cultural Understanding
6. Computing and ICT Literacy
7. Career and Learning Skills
8. Compassion

Even though Finland's population is so small at 5 million compared to the size of the country that stretches across the Arctic Circle, why does this low-population country have almost all competitive power globally? For example, people's ability to read and use languages. Lundvall (2021) discussed the creative abilities of Finns at the Windsor Academic Center's Collaborative Conference with University of Turku that Finland is known for its world-class design and creativity, such as the world brand like Marimekko, who has been trending since the aftermath of World War II, and winning furniture designer Alva Alto, the world design award comes

from a wooden tea trolley that uses 2 legs and 2 wheels to support the weight. In addition to that, there are also the most popular games with the most downloads in the world like the famous Angry Birds video game. In terms of quality and quantity of work results are very high compared to working hours that are less than other nations. Or even the competitiveness of technology that many people never know. Finland designs and manufactures software for global companies that drive the economy, from elevators for skyscrapers like Kone, or innovative navigation and communications software like Nokia. Education and teaching techniques that became Finland's export products within a short time.

3. Factors for the success of the reforms of Finland's educational reforms

Finland has achieved remarkable reforms in its educational system in many respects which the government has aimed to reform to transform education that adheres to sustainable development principles. Finnish education reforms have been in place since the early 1970s and were heavily pushed into the 1990s.

Table 1 Comparison of educational reform guidelines (updated from Areekul, 2016)

Global Education Reform Movement (GERM)	Finnish Model
competition between schools	cooperation between schools
standardized learning	Personalized learning
Emphasis on literacy and arithmetic knowledge	Emphasis on the development of learners in a holistic manner
Responsibility standards based on test results	Assigning Responsibilities Based on Trust
school selection	equality of results

Education policies and reform principles are clearly and concretely designed. When compared to the reform approach of the Global Education Reform Movement: GERM, the picture becomes clearer. The education system that the state provides to Finnish citizens is of a high standard. This is due to effective policy making in education and society. And cannot ignore the continuous improvement because of the positive dynamics development by the strong coordination of the government with the private sector and the people's sector. It is an extremely important element in the administration for reform. This is also in line with Wallin (2018) who outlines the issues contributing to the success of Finland's educational reforms as listed:

1. Equality and education of the people

Sahlberg (2016) stated that “literacy is the backbone of Finnish culture.” open and equal access to education. Therefore, it is an important factor for the success of the country's development. This started with the development of equitable quality of education resulting in lower rates of dropouts, obesity, and adolescent pregnancy.

2. Equity and Fairness

Students come from economically affluent families and different societies learn together in the classroom. The state provides free health care and education services to the people. Lunch and free health care and dental services are available as well. There are psychologists and teachers to promote students' learning development. In addition, the state also prioritizes welfare management as to who is suitable for what type of welfare and how urgent. Welfare procurement and support comes from Finland's large tax sources, where the state imposes a high level of personal income tax and VAT on goods and services which is almost twice of personal tax rate in Thailand.

3. Teacher's Values

Teachers teach only 4-5 hours a day, giving them time to prepare for teaching and to reuse existing knowledge. They have more time to pay attention to students. Teachers receive very good income and working conditions. This makes the Finns have the most statistical choice to study "Education". It is clear that Finland values knowledge of Education degree and the importance of it. Education-related faculties will be given substantial development budgets to ensure that higher education institutions produce quality teachers to meet the needs of teachers in the country's education system.

4. Relaxing Environment

Schools in Finland are calm and informal. There is no school uniform, children have time to live as children, be with friends, and doing other things that he or she likes to do besides studying in the classroom. No need to worry about exams during the first 5 years of school. In the following year, students are assessed based on their ability in class. The key thing that teachers have to do is to help students learn with worry-free and develop their natural curiosity rather than passing the exam.

5. Public Service

Finland is an excellent state welfare and the Finns see the public education system as a public service that they deserve. Families can plan to get their children to school at the right age, meaning 6 years of age, and be able to continue their education up to a postdoctoral degree without worrying about tuition fees, as all of this is covered by Finnish government budget.

6. Attributes of the Finns

Finnish people are fair, honest, socially just, and have a sense of responsibility for the community to the surrounding society. Finland's educational policy design has applied the concept of international education reform and merged it with the welfare-state management, emphasizing knowledge-based economic development. At the heart of the policy mentioned educational policies that lead to systematic excellence, it must be built on the foundation of sustainable policy-making and leadership.

4. Finland, the land of dreams

The key factor contributing to the success of Finland's happiness education system is the quality of teacher personnel. The indicators of teacher success can be seen from teachers in Finland are highly motivated and self-assured. By attending educational development training in the perspective of educators with the Finnish Embassy in Thailand in 2019 delivered by Kaisa Vuorinen, an expert in Positive Psychology and Positive Studies from Finland explained that; for Finland, teachers are considered one of the most popular professions. The income is high and the position is very competitive. Those who wish to take a course in Pedagogy at the university level in order to prepare for a career as a teacher, must undergo rigorous testing and must study at least 5 years until completing a master's degree. It is to ensure that teachers in schools are not the only experts in the sciences they teach, but must be an expert in teaching science as well. At the ISSE 2016 (International Symposium on STEM Education), the content and topics were focused on STEM education and learning management. A panel discussion on the topic "Curriculum Reform for pre-school, comprehensive school and high school in Finland" on curriculum reform for schools at all levels in Finland. It shows the concepts and perspectives on education reform of Finland with dynamics that correspond to changing contexts and adjusting the readiness of teachers to be in line with the reform. The education administration did not focus on grading scores but interested in developing skills goals that can actually solve problems in the future and learners can utilize knowledge through practice and adapt to changing phenomena such as problem solving skills, creative skills, and collaboration skills. Those are very important skills for living and working. Relying only on knowledge and science processing skills alone may not be enough anymore. Learners must be able to integrate diverse knowledge including linking knowledge from a variety of disciplines to use in solving problems and living. This is the view and goal of Finnish educational administration that the many countries try to study and apply in the context of their own country.

5. Finland has made great success in education reform

Many countries around the world take Finland's approach to development as a model because of the results in more sustainable quality people in society with the following successful concepts:

1. Finnish education does not focus on the examination until the 4th grade because it is believed that spending time to read the examination paper causes students lack of time for creativity. Schools provide child responsibility assessments instead of grading to measure test scores.

2. Children are not required to attend school until the age of 7 which is the entry into the basic education system established by the state. And when entering elementary school, there will be only 4-5 hours of study time per day.

3. Finnish education encourages students to spend time playing and being outside of the classroom. At the same time, teachers pay attention to the children's personal time. For every 45-minute study, children are legally entitled to 15-minute private breaks in the belief that children can learn well through playing rather than studying. And learning will be more effective if the child relaxes periodically during lessons on tap per day.

4. The trust between the departments involved in education from governments, school districts, teachers, and parents is very important to the development of education. In addition, Finnish schools do not have a competition or ranking of achievements for each school because the education system has the same standard in which teachers will teach according to the curriculum and can insert creativity, but under the same standards throughout the country.

5. Finnish students do not need to travel long distances or travel to the city to study in the conceptual schools as seen in many countries. This is because all Finnish state schools have the same standards. Students therefore choose to go to the school closest to their home. And there is plenty of time to make use of their free time.

6. Finland places a high emphasis on the teacher selection process and is rigorous. Teachers in Finland must have a combination of qualities in both knowledge Master's level competence, morality, passion, and inspiration to be a teacher. Because the Finnish education system with the belief that teachers who are happy to work are good teachers, and teachers are allotted to only about 20 teaching hours per week.

7. Finnish schools are designed to provide an environment that encourages participation, for example by providing some space for students at different grades to learn and exchange experiences together. And outdoor areas are provided to relax, do various activities, run, play, or chat with friends.

8. Finnish society accepts all courses whether it is a general education or a vocational and both lines can pursue university degree. Choosing a general education or vocational course is a matter of choosing your future career path and the necessity of utilizing the knowledge gained over choosing the name of the university, difficult faculties, or even the location of the educational institution.

9. Finnish schools are not divided into schools for girls or boys. Schools are not divided on any aspect of students except for the age criteria in each level of the class only.

10. Finnish schools teach ethics to students from an early age. By providing it as a compulsory subject that everyone must attend, regardless of religion, which sees that ethical learning is consistent with the practice of local and global societies.

Looking at the key points of success in improving the quality of education in Finland. What particularly interesting is that when considering the level of educational success for teachers and students, stress levels were very low. This makes Finland one of the countries where students score better in the Program for International Student Assessment (PISA) than children in other Developed Countries in the Organization for Economic Cooperation and Development (OECD) comparing the study hour per week to stress level, happiness level, and creativity level. Finnish upper secondary students have approximately 36-38 hours of study per week, or an average of 6 hours per day, they have the PISA scores in the top five in the world, similar to Singapore. But when comparing this very high score to a very low stress level of Finnish students found that, they have very high level of happiness including the level of creativity in creating innovation. No other country can do it like Finland does. Another countries with high test scores are ranked in the world list together with Finland. But it was found that the students had high stress levels, low happiness level, and the level of creativity is lower as well.

6. Conclusion

Finnish education is not only a quality education system for young people and people in society. But also affects the development of the country better in all aspects, such as an economic system with greater global competitiveness and potential, very low corruption, low population, well-being, and have a sustainable quality lifestyle. Phenomenon-Based learning is a concept that is consistent with the approach to studying current events. This is because the concept focuses on using questions or defining problems to lead learners to find answers and solve them. By bringing phenomena in the real world for learners to observe with a variety of perspectives according to the process of searching for knowledge. In addition, learners play a major role in learning through action which gives learners the inspiration for life-long learning through Phenomenon-Based Teaching which is based on the theory of self-knowledge (Constructivist Theory) that focuses on critical assessment (Butkatanyu, 2018, pages 348-500).

As mentioned above, it can be seen that the aim of today's education is not focused on scoring competitions or numerical metrics like in the past, but to prepare students for global citizenship. There will be a change in the diversity of identities and cultures of the world as well as various issues, major events, crises, phenomena occurring in our world, no matter what country it is. This is in line with the opinion of Wiriya (2018), who said that those issues deserve to be explained in the classroom using a variety of an engaging teaching and learning methods that focuses on discussion, questioning, and hypothesis. Seeking answers with a focus on ensuring learners are responsible citizens and effective contributions to the global society and has a view of shared responsibility between people from other countries. An all other races that live together with us on this planet. Educators saw that developing students to be citizens who focus on social justice to be an effective Justice-Oriented Citizen requires an opportunity to analyze and engage with society, economy, and politics. It leads students to see injustice and the importance of seeking justice in society

7. Suggestions

7.1 There should be a comparative research study on the Thai and Finnish education systems and propose an alternative education model for Thailand. The education reform should implement from research results in designing the model according to Thai context in digital era. Students in higher education level should be encouraged to write more articles on comparative studies to promote the perspective of quality management and the development of the educational system.

7.2 Educational institutions are able to adapt the Finnish approach to educational management in accordance with the educational management philosophy of the educational establishments. Even if the educational institution is teaching according to the curriculum of any countries, it still can apply the principles of Finnish educational management and setting up a learning environment to suit their own curricular activities.

8. References

- Areekul, C. (2016). Book Review : Finnish Lessons 2.0: What Can the World Learn from Educational Change in Finland. *Journal of MCU Social Development*, 1 (3), 107-113. (in Thai)
- Butktanyu, O (2018). Phenomenon-Based Learning for Creating a Holistic Perspective and Access to the Real World of Learners. *Education Journal Chulalongkorn University*, 46 (2), 348-365. (in Thai)
- Chanunan, S. (2017). Report of the Attendance of the International Academic Conference on STEM Education. International Symposium on STEM Education: ISSUE 2016 at Lahti, Finland. *Journal of Education Naresuan University*, 19 (1). 329-331. (in Thai)
- Colagrossi, M. (2018). *10 Reasons Why Finland's Education System is the Best in the World*. Big Think. Retrieved from: <https://www.weforum.org/agenda/2018/09/10-reasons-why-finlands-education-system-is-the-best-in-the-world>
- Innoi, S. (2020). Teaching Fin, Fun Learning, Finnish Style. Teach Like Finland. *Industrial Education Journal*, 19 (1). 6-14. (in Thai)
- Mahawijit, P. (2017). Innovation of Learning from Finland. Learning is Thought Provoking. *IPST Magazine*, 46 (209), 40-45. (in Thai)
- Meesuk, P., Uapipattanakul, B., Ritpanichchatchawan, N., Ruangpaisan, N. & Sukyos, O. (2018). Development of Teaching Model Teachers at University Level (RMUTT Model): The concept of Finland to Thailand. *Education Journal Chulalongkorn University*, 46 (2), 314-329. (in Thai)
- Panich, W. (2013). *Enjoy Learning in the 21st Century*. Bangkok: Siam Commercial Foundation. S.R. Printing Mass Products. (in Thai)
- Sahlberg, P. (2016). *Finnish Lessons 2.0: What Can the World Learn from Educational Change in Finland*. (1) (Translated by Pidchamook, W.). Bangkok: Openworlds. (in Thai)
- Sankhaburarak, S. (2020). Development of Learning Skills in Relation to Real-Life by Phenomenon-Based Teaching is the basis of the Finnish Learning Model. *Journal of Chinese Studies Kasetsart University*, 13 (1), 61-81. (in Thai)
- Silander, P. (2015). *Phenomenon Based Learning*. Retrieved From: <http://www.phenomenoeducation.info/phenomenon-based-learning.html>.
- Thanalertsomboon, P. (2020). Positive Learning: Removing Lessons of Happiness Education Model from Finland. EEF and The 101 World. Thai Education: Turning Inequality into Equality. *Equitable Education Fund*. Retrieved from: <https://www.the101.world/positive-learning-finland/> (in Thai)
- Walker, T.D. (2019). *Teach Like Finland: Fun Teaching, Fun Learning, Finnish Style*. (1) (Translated by Huansuriya, T.). Bangkok: Book Scape. (in Thai)
- Wallin, C. (2018). Catching Up with World Education Trends. BBC News Brazil. pptvhd36.com. *Education Journal Chulalongkorn University*, 46 (4), 520-522. (in Thai)

Wiriya, P. (2018). *Presentation of Teaching and Learning Activities of World Events in Modern Times for High School Students*. (Master's Thesis). Department of Social Studies Teaching Silpakorn University. Bangkok. (in Thai)

References (based on empirical data by attendance)

- Karhu, H. (2020). Training on the Development of Thai-Finland Cooperation hosted by the Finnish Embassy in Thailand at the Finnish Ambassador's Residence in Thailand, Bangkok. Lectured by His Excellency Mr. Hekki Karhu, Deputy Ambassador of Finland to Thailand.
- Kleven, S. (2018). Training on Finnish Education hosted by the Finnish Embassy in Thailand at the Residence of the Finnish Ambassador to Thailand, Bangkok. Lectured by H.E. Mrs. Satu Kleven, Finnish Ambassador to Thailand.
- Lundvall, G.H. (2021). Academic cooperation meeting of the Windsor Academic Center (Thailand) and University of Turku at the Finnish Embassy in Thailand, Bangkok. Lectured by Dr. Ari Koski, University of Turku.
- Naantali Medical Center. (2004). Study tour at the Naantali Medical and Health Center, Naantali, Finland.
- Puolalan Koulu. (2005). Study tour at Paolala Elementary School, Turku, Finland.
- Ruisalo Vocational institute. (2004). Study tour at Ruisalo Vocational College, Ruisalo, Finland.
- Turun Sanomat. (2005). Study tour of the Turun sanomat newspaper, Southwest Finland.
- University of Turku. (2005). Study tour at University of Turku, Turku, Finland.
- Vuorinen, K. (2019). Training on Educational Development from the Perspective of Educators hosted by the Finnish Embassy in Thailand at the Finnish Ambassador's Residence in Thailand, Bangkok. Lectured by Kaisa Vuorinen, an expert in positive psychology and positive studies.

**THAI SECOND-YEAR STUDENT TEACHERS' PEDAGOGICAL CONTENT
KNOWLEDGE IN LEARNING MANAGEMENT COURSE: CASE STUDIES
AT SURINDRA RAJABHAT UNIVERSITY**

Chittamas Suksawang

Faculty of Education, Surindra Rajabhat University

E-mail: Chittamas.s@srru.ac.th

Urai Jantamuttukarn

Faculty of Education, Surindra Rajabhat University

E-mail: Urai202511@gmail.com

ABSTRACT

Pedagogical Content Knowledge (PCK) development is considered as a goal of teacher education. The purpose of this study was to explore the second year student teachers' PCK in Learning Management Course. The participants were Thai second-year student teachers who enrolled in the Learning Management Course. The course was offered in the second semester, 2563 academic year, in Surindra Rajabhat University which was located in the North Eastern Part of Thailand. This study employed an interpretive qualitative-based research with case study method. Multiple data sources consisted of classroom observation, semi-structure interview of the student teachers' lesson plans and micro-teaching practices including document review. Inductive analysis with constant comparative method was used in this study. The results revealed that the integration in all domains of pedagogical content knowledge had influence on the student teachers' PCK. The student teachers who integrated appropriately and effectively with all kinds of PCK components, could develop their PCK in the area of teaching.

Keywords: Pedagogical content knowledge, Student teacher, Teacher education, Learning Management Course

1. Introduction

In the past three decades, many studies have focused on the increased attention to teacher knowledge and how it is developed. Much of this interest was stimulated by Shulman's model that introduced the concept of pedagogical content knowledge (PCK) as a distinctive body of knowledge for teaching. PCK is an acknowledgement to the importance of the transformation of subject matter knowledge per se into subject matter knowledge for teaching. His model of teacher knowledge incorporating the formation of PCK has had an important impact on teacher education. He defined PCK as the amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding. More recently, Loughran, Berry, and Mulhal (2012) re-conceptualized PCK as the knowledge that teachers develop over time, and through

experience, about how to teach particular content in particular ways in order to lead to enhance students' understanding. It stands to reason that in order to recognize and value the development of their own PCK, teachers need to have a rich conceptual understanding of the particular subject content that they teach. This rich conceptual understanding, combined with expertise in developing, using and adapting teaching procedures, strategies and approaches for use in particular classes, is purposefully linked to create the amalgam of knowledge of content and pedagogy that Shulman described as PCK. Therefore, PCK is the unique combination of content and pedagogical knowledge that helps teachers transform the particular content into learning experiences for enhancing students' learning.

2. Research Objective

The purpose of this study was to explore the second-year student teachers' PCK in Learning Management Course which was conducted during the second semester, 2563 academic year in Surindra Rajabhat University.

3. Literature Review

Shulman (1987) proposed seven domains of teacher knowledge emphasizing that teaching is a complex process requiring teachers to apply knowledge from multiple domains. The domains are content knowledge, general pedagogical knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners and their characteristics, knowledge of educational contexts, and knowledge of educational ends, purposes, and values. Of these domains, he highlighted PCK as follows:

It represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners and presented for instruction. Grossman (1990) builds on Shulman's ideas to highlight the relationship among three knowledge domains that influence a teacher's PCK. These knowledge domains include subject matter knowledge and beliefs, pedagogical knowledge and beliefs, and knowledge and beliefs about the context. According to Grossman, PCK is a type of knowledge that is transformed from these three knowledge domains and is more powerful than its constituent parts. Her study of beginning teachers, reported that PCK was developed from the following sources: observation of classes as a student and teacher, specific courses during teacher education, and classroom teaching experience. Magnusson, Krajcik and Borko's PCK model (1999) elaborates on Shulman's and Grossman's work and conceptualizes PCK as consisting of five components including orientations toward teaching science, knowledge of science curriculum, knowledge of students' understanding of science, knowledge of instructional strategies, and knowledge of assessment in science.

PCK is the conceptual framework for this study. Specifically, the authors draw upon Magnusson et al. (1999) as the basis for the decision to focus attention on the components of PCK for teaching science (see Figure 1), knowing how the student teachers integrate those components during their micro-teaching experiences.

4. Research Methodology

4.1 Research Design

This study was an interpretive qualitative-based research with case study method. The main feature of case study research focused on a particular situation, event, program, or phenomenon (Merriam, 1998).

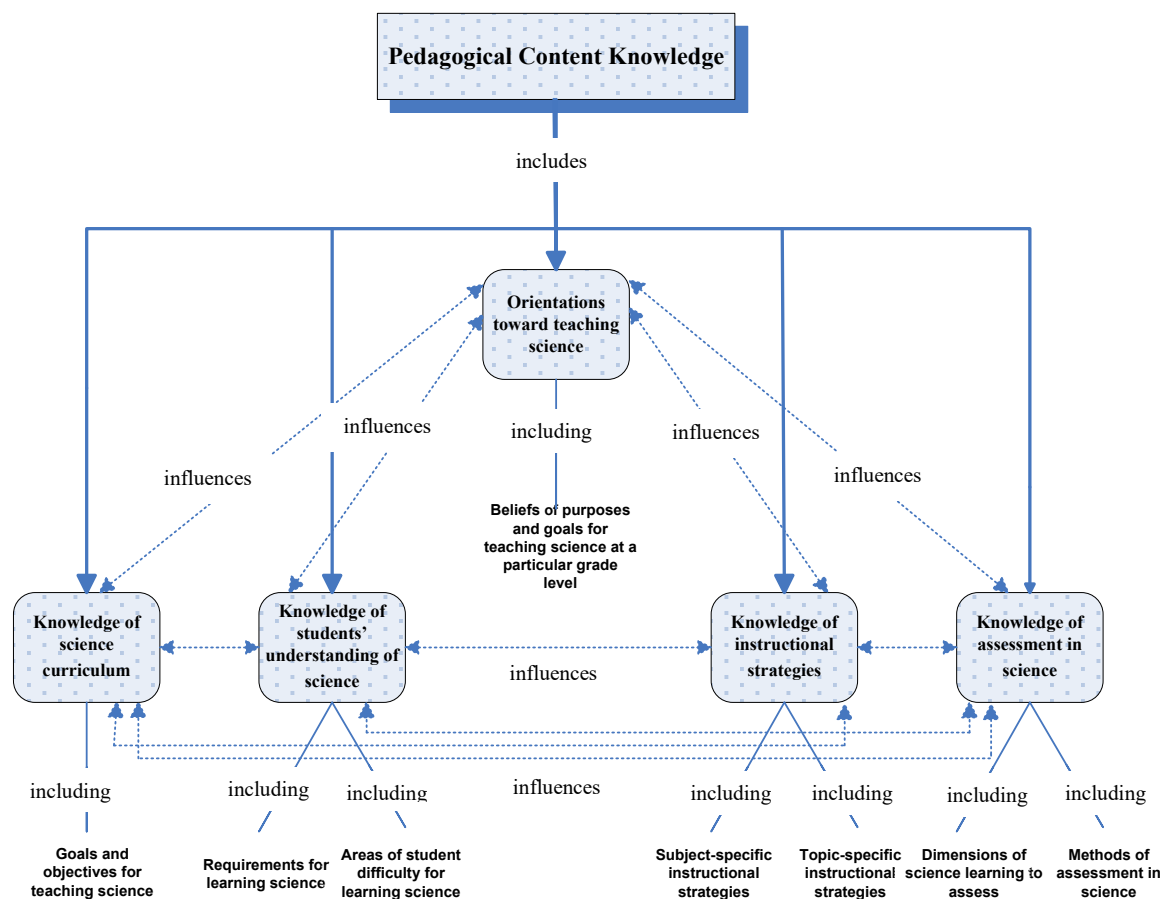


Figure 1: Components of pedagogical content knowledge for science teaching (Magnusson et al., 1999)

4.1.1 Participants and Setting

The participants included 62 Thai second-year student teachers who enrolled in the Learning Management Course, which was offered in the second semester, 2563 academic year, at the Faculty of Education, Surindra Rajabhat University. The first author was responsible for supervising the practice for 2 sections. The 23 student teachers who enrolled in Section 21 of the Course and the other 39 of them enrolled in Section 22 of the Course. Their 11 major fields of study were interdisciplinary subject areas including Programs in Thai, English, Information Science and Library Science, Classical Dance, Social Studies, all of these major areas were taken in the Faculty of Humanities and Social Sciences. Moreover, Programs in Digital Technology for Education, Elementary Education, Early Childhood Education, and Physical Education were taken in the Faculty of Education. Programs in Home Economics and Computer were taken in the Faculty of Science.

Before their one-year of teaching practice during the final fourth year of the Teacher Preparation Program, they all were required to pass all courses taken in education and their subject areas during the previous three years.

According to the researchers' role, the first author was one of the lecturers in the course and the second author, one of the lecturers as the first author, had more than 15 years of teaching experiences in this course. Her main role in the study was as the co-researcher who observed and examined student teachers' lesson plans and their document reviews during their micro-teaching. The micro-teaching was considered as the important strategy to explore their PCK.

Regarding the Learning Management Course that was conducted in the second semester, 2563 Academic year in the Faculty of Education of Surindra Rajabhat University, this course is required for the second-year student teachers to be enrolled. The course description included instructional planning and management relevant to the learners' nature of major to develop learners to be an intellectual person and innovator, enhancing student learning, attending and accepting individual differences among students, creating activities and learning atmosphere for promoting students' happiness in learning; awareness in learners' well-being, integrating knowledge, content, curriculum, teaching science and digital technology in instruction by using the learning theories, instructional innovation for skills development in the 21st Century skill, integrated instruction in interdisciplinary subject area, integrated instruction using the sufficiency economy philosophy, integrated instruction using the particular content and language learning, integrated instruction on media and learning resources in local community, digital technology media; inclusive education; coaching; classroom management, designing and lesson plans writing in the particular content; micro-teaching; and practicum in the real situation.

4.2 Data Collection

To explore the second-year student teachers' PCK development through micro-teaching, the student teachers were asked to design and write their lesson plans in groups, each group consisted of 2-3 persons, after revising their lesson plans by the researchers, they were asked to prepare their teaching by micro-teaching relevant to the revised lesson plans. The multiple data sources were used in this study, the classroom lessons were observed and audio recorded. The observed lessons for each group of the student teachers took about 30 minutes in the period of time. They were also asked to reflect on their teaching practices after the class. All interviews were conducted in a semi-structured way that allowed them to tell their own successful and progress. In addition, the author also interviewed them after the lessons about their teaching. All the interviews were also recorded and transcribed verbatim. The documents as lesson plans, worksheets, learning materials, assignments, and reflective journals were reviewed as additional data in this study.

4.3 Data Analysis

Methodological triangulation was achieved through multiple data sources such as the lesson plans, interview transcriptions, field notes, and document reviews. The validation of the interpretation was promoted by applying inductive analysis with constant comparative method, in which categories, properties, and hypotheses were used to provide conceptual links between and among categories and properties. It was used to analyze data

by assessing codes that reflect various categories and properties to unit of data through sorting them into groups of like substance or meaning (Merriam, 1998). This involved the comparison of the analysis of the interview transcriptions with other sources such as lesson plans, field notes and document reviews. The researchers coded the lesson plans, interview transcriptions, and document reviews using the five categories of PCK model: (a) orientations toward teaching science, (b) knowledge of science curriculum, (c) knowledge of students' understanding of science, (d) knowledge of instructional strategies, and (e) knowledge of assessment in science (Magnusson et al., 1999).

The researchers achieved methodological triangulation by collecting data from multiple sources: lesson plans, interview transcriptions, field notes, and document review. This process allowed the same data to be viewed from various perspectives, which clarified the meaning of the data in the larger context. In addition, the researchers conducted member check (Guba and Lincoln, 1989) to establish credibility, to clarify meaning, and to check the accuracy of the data from the student teachers' interview transcriptions by asking them to read the transcriptions of dialogues in which they had participated.

5. Research Findings

5.1 Orientations toward teaching

According to the PCK framework based on Magnusson et al. (1999), the orientations toward teaching science was the teacher's knowledge of the purposes and goals for teaching at a particular grade level. According to the orientations for teaching which were considered from the characteristics of the instruction, the results revealed that almost all of the student teachers hold conceptual change orientation and activity-driven orientation. The teaching sequences were primarily introducing the lesson with various situations or examples in the student daily lives or games or songs followed by questioning to explore students' prior knowledge, asking students to do hands-on, minds-on activities in small groups, concluding the lesson with students and giving related examples and exercises. The results implied that they focused on student-centered approach. The findings are consistent with the previous studies (Friedrichsen *et al.*, 2007; Gess-Newsome, 2015), which were stated that the teachers should be developed to provide orientations toward teaching science which focused on the student-centered orientations because they had influences on several kinds of knowledge.

5.2 Knowledge of the curriculum

The student teachers were knowledgeable of the goals and objectives for the students which heavily focused on three domains of cognitive, affective, and psychomotor domain in the teaching. Furthermore, they were aware of the national curriculum: The Basic Education Core Curriculum (A.D. 2008, revised version in 2017) and some of them also realized that the objectives were needed to meet the national curriculum guidelines. They viewed the national curriculum as a useful source for the understanding of what students should learn. The results implied that the student teachers considered the national curriculum guidelines as the way to meet the student outcomes. The findings are consistent with the previous studies (Haney and McArthur, 2002; Carlson et al., 2015) which stated that curriculum knowledge affected the instructional decisions.

5.3 Knowledge of students' understanding

The results showed that initially in the student micro-teaching, most of the student teachers did not know the students' learning difficulties. In relation to the students' alternative conceptions, some of the student teachers did not correct their answers or give them more explanation. The findings are consistent with Van Driel, De Jong, and Verloop (2002), which stated that the teachers not only lacked the knowledge of student difficulties, they also lacked content knowledge. However, some of the student teachers could develop the knowledge about the students' learning difficulties. They could identify the students' misconceptions and give them more details. The findings are consistent with the previous studies (Davis, Petish, and Smithy, 2006; Carlson et al., 2015), which stated that the knowledge of learners was one of the factors that influenced instructional decision-making.

5.4 Knowledge of instructional strategies

The results showed that the student teachers implemented student-centered approach, conceptual change approach and activity-driven approach. The evidence from the author's field notes showed that they started the lesson by questioning students to explore their prior knowledge about the topic they taught. This was followed by the various activities such as models, analogies, explanation, demonstration and explanations with examples which were relevant to the topics. They also asked the students to work cooperatively in groups. The students were interested because the learning materials and resources were relevant to their daily lives. Next, almost all of the student teachers concluded the lesson with students and gave related examples and exercises. The findings are consistent with the previous studies (Grossman, 1990; Boz and Boz, 2008), which reported that pedagogical knowledge and content knowledge, were found to be the main factors for choosing a teaching strategy. The teachers who had pedagogical knowledge and content knowledge could adapt new strategies for teaching in particular topics in appropriate way.

5.5 Knowledge of assessment

The results revealed that some of the student teachers could develop the knowledge of assessment, they heavily focused on alternative assessments and formative assessment: performance assessment, task, testing, concept mapping, report, and worksheet. However almost all of them could not use the assessment processes appropriately in their teaching, especially the assessment criteria. The findings are consistent with Kamen (1996), which stated that the using of formative and alternative assessments could support the teachers to have better understanding of what the students were learning. In addition, the teacher's implementation of new assessment strategies was facilitated by administrative supports and through assistance from university faculty.

6. Discussion

Based on the results of the study, the authors concluded that the integration in all domains of pedagogical content knowledge influenced the student teachers' PCK. The student teachers who integrated appropriately and effectively with all kinds of PCK components, could develop their PCK in the area of their micro-teaching. However, some of the student teachers sometimes separated the content knowledge from the pedagogical knowledge. Thus, they should be contributed to PCK development. Furthermore, the PCK

development depended on student teachers' deeply understanding of knowledge of particular content. If they hold misconceptions in the content knowledge during the disciplinary education, they usually contained misconceptions and deficiencies in PK and PCK which caused students' alternative conceptions. Therefore, it may be suggested for the Teacher Preparation Program that it should revise to the courses in education and other courses relevant to their areas of the study to develop their PCK during the courses which were taken during their study in the university. Moreover, the student teachers should be provided with more experiences to develop their PCK through workshops, or coaching, or mentoring which were relevant to their fields.

7. References

- Borko, H. and Putnam, R. T. (1996). Learning to teach. In C.B. David & C. C. Robert, (Eds.), *Handbook of educational psychology* (pp. 673-708). New York: Macmillan.
- Boz, N. and Boz, Y. (2008). A Qualitative Case Study of Prospective Chemistry Teachers' Knowledge About Instructional Strategies: Introducing Particulate Theory. *Journal of science teacher education*, 19, 135-156.
- Carlson, J. Stoke L., Helms. J., Gess-Newsome J. and Gardner A. (2015). The PCK Summit: A process and structure for challenging current ideas, provoking future work, and considering new directions. In A. Berry, P. Friedrichsen, & J. Loughran, *Re-examining pedagogical content knowledge in science education* (pp.14-27). New York and London: Taylor and Francis Group.
- Davis, E. A., Petish, D., and Smithey, J. (2006). Challenges New Science Teachers Face. *Review of Educational Research*, 76 (4), 607-651.
- Friedrichsen, P., Lankford, D., Brown, P., Pareja, E., Volkmann, M., and Abell, S. (2007). The PCK of Future Science Teachers in an Alternative Certification Program. *Paper presented at the National Association for Research in Science Teaching Annual Conference*, New Orleans, L.A.
- Gess-Newsome, J. (2015). A model of teacher professional knowledge and skill including PCK. In A. Berry, P. Friedrichsen, & J. Loughran, *Re-examining pedagogical content knowledge in science education* (pp.28-42). New York and London: Taylor and Francis Group.
- Grossman, P. L. (1990). *The making of a teacher: Teacher knowledge and teacher education*. New York: Teachers College Press.
- Guba, E.G. and Lincoln, Y. S. (1989). *Fourth Generation Evaluation*. Newbury Park, CA: Sage.
- Haney, J. J., and McArthur, J. (2002). Four case studies of prospective science teachers' beliefs concerning constructivist teaching practices. *Science Education*, 86 (6), 783-802.
- Kamen, M. (1996). A teacher's implementation of authentic assessment in an elementary science classroom. *Journal of Research in Science Teaching*, 33 (8), 859-877
- Loughran, J., Berry, A., and Mulhall, P. 2012. *Understanding and developing science teachers' pedagogical content knowledge*. Rotterdam: Sense Publishers.

- Magnusson, S., Krajcik, J. and Borko, H. (1999). Nature, Sources, and Development of Pedagogical Content Knowledge for Science Teaching. In J. Gess-Newsome and N. G. Lederman, *Examining Pedagogical Content Knowledge* (pp. 96-115). The Netherlands: Kluwer Academic Publishers.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Sanders, L. R., Borko, H. and Lockard, D. J. (1993). Secondary science teachers' knowledge base when teaching science courses in and out of their area of certification. *Journal of Research in Science Teaching*, 30 (7), 723-736.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15 (2), 4-14.
- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57 (1), 1-22.
- Van Driel, J. H., De Jong, O., and Verloop, N. (2002). The Development of Pre-service Chemistry Teachers' Pedagogical Content Knowledge. *Science Education*, 86 (4), 572-590.

THE CREATION OF YARN EMBROIDERY ARTWORK.

‘FADING MEMORY’

Chutima Promdecha

College of Fine Arts , Bunditpatanasilpa Institute

E-mail : chutimapromdecha@gmail.com

ABSTRACT

The creation of an artwork “Fading Memory” begins with an inner feeling due to the pandemic crisis of COVID-19 that causing educational institutions need to manage online teaching and learning, then no one have to go to college and the memories of about it was slowly fading away with time. This creation was created to convey memories by extracting nature form and using visual elements into abstract art and to present feelings and create aesthetics through the embroidery process with punch needle by express it into a visual art in abstract style by using the visual elements namely lines, shapes, colors, space and textures. And also mixed with natural material namely wood sticks and dry leaves. It was arranged using the principle of art composition on 2 pieces of 2D work with yarn embroidery on fabric by using punch needle with seven steps to create as fellow 1. Define method 2. Study and research for information 3. Create sketches 4. Prepare materials and equipment 5. Experiment on textures 6. Embroidering yarn on fabric by using punch needle 7. Mixed natural material on artwork. The educational and created this artwork has done to convey the fading memories, responses the personal feeling and creates aesthetics through the yarn by using its colors and creating textures. In the use of color, it focused on colors that close to the nature namely red, pink, orange, yellow, white and green by made it fading into white and in the texture part, it focused on create the level and type of texture resulting from using a punch needle that is a repetition required equipment while using it then made the creator calm and found aesthetics. This artwork is also mixed with the real nature material that related with memories and experiences. This “Fading Memory” could create a unique identity, aesthetics and communicated the content through visual elements with materials.

Keywords : Memory, Embroidery, Punch Needle, Abstract, Aesthetics

1. Introduction

In the condition of the pandemic crisis of Coronavirus Disease 2019 or COVID-19 that is currently happening being in a state of keeping distance from everyone and the rules, laws or regulations that all of us have to follow for safety causing the normality of life seem difficult to get back soon, and it was causing educational institutions need to manage online teaching and learning then no one have to go to college. An empty college was a very unfamiliar sight. Without teaching and without students, like a big body without a heart and soul, and made

it close to an abandoned place. Part of nature began to swallow up the overall atmosphere, made it close to an abandoned place. These nature and plants were given materials and has been an important role in many activities, made classes to diverse and enjoyable. Seeing these plants growing solitary, made the creator relive the memories of having fun with the students in the midst of these natures and found that not all of them could be figured out because these memories are slowly fading away with time, then one thought come inside the creator's mind. If there is still need to continue teaching online, one day all memory about going to college and having fun with classes, students or friends would be completely forgotten. This experience causing sadness and loneliness and then inspired to create an artwork to reflect the fading of joy memories as at Pupink Mettanaitam (2016, 1) said that artistic process can be a tool to soothe and lull the mind, distracting from pain and anxiety. Art is not really a form of communication, but a sound that echoes from the inside. Art is not only an opening of a communication way between the inner world and the outer world, experience to experience. But art is a tool that can actually be used for self-healing.

The artwork will present through the process of yarn embroidering in the creation of 2D work with embroidery technique by using a punch needle that the creators have the skills and expertise through the composition of visual elements mixed with natural material to transmit the feelings, create aesthetics and communicate them through the artwork creation.



Figure 1-2 College of Fine Arts, Source : Creator (2021)

2. Creation Objective

- (1) To create an embroidery artwork "Fading Memory"
- (2) To convey memories by extracting nature form and using visual elements into abstract art.
- (3) To present feelings and create aesthetics through the embroidery process with punch needle.

3. Literature Review

3.1 Theory, Concept and Related Research

(1) Composition of Art and Visual Elements

The creator want to create work by using five visual elements : line, color, shape, space and texture. Along with the principles of Art Composition such as unity, balance, focus, conflict and harmony to communicate feelings in the mind, as Professor Chalood Nimsamer (2016, 30 and 130) said,

“The creation of art has two major components: the object structure, which is the tangible structure, and the content structure. which is an abstract component. By the first structure, artists create unity by using visual elements: points, lines, shapes, forms, values, colors, textures, and spaces. Forms are visually pleasing, then coordinate with the content structure. Connect symbolically to emotions, feelings, or things that happen in the artist's mind.

Creating art is about creating unity out of confusion, clutter, organizing and balancing the contradictions so that they can come together. The artist is responsible for collecting and allocating elements that have figurative and nominal parts. to bring about unity.”

Consistent with what Kamjorn Sunpongso (2016, 103 and 145) said, visual elements are the basis and main structure of artistic creation in the field of visual arts in particular, consisting of points, lines, shapes, forms, colors, values, spaces and textures then create the unity by using them with harmony, rhythm, balance or emphasis is a factor that makes the work complete, unique, achieve goals and create aesthetics that could counted as the success of the creation of artworks.

(2) Abstract Art

It is a term for fine arts that flourished in the 20th century. It has two expressions : The first one is Organic Abstraction, created from sudden internal feelings. The work's nature will be highly independent, without boundaries, close to biomorphic forms, and the second one is Geometric Abstraction, often appearing shapes and geometric shapes in the works. Always come with clear boundaries from the composition and placement of visual elements and always emphasis on presenting things that do not look natural, not linked to any content, using only basic visual elements. In the creation of works, the goal is to transmit feelings and to arouse the drive in the mind.

(3) Aesthetics

It is a science that deals with beauty or pleasure that exists in nature and art, in which the feeling of the beauty is individual and depends on many factors such as character, taste, background or education, etc. Vanida Khamkhiao (2020, 124) has discussed aesthetics and art as follows.

Nature is an important part in being a role model and source of inspiration for human. It can be said that the feeling of beauty that arises in humans is the result of nature that leads human to passion, pleasure or even the touched or sadness. This results in the observation and discovery of natural laws such as harmony, balance, rhythm, etc., including points, lines, colors or basic visual elements therefore came to be used in the creation of various works until the formation of a civilization. Art and nature are therefore important tools for human access to understand the phenomena or aesthetic conditions that allow artists to create works such as thoughts, imaginations, emotions, feelings, or hidden ideas. Aesthetics are therefore of great importance in elevating the human mind to perfection which can be summarized as follows: 1) Aesthetics contribute to emotional and intellectual development. contribute to the analysis It creates a profound thought in considering things, thereby regulating emotions and expressing one's feelings accurately and constructively. 2) Aesthetics

promote awareness and learning in a creative way. 3) Aesthetics help develop ideas, values, feelings and minds in a creative way. 4) Aesthetics can solve various problems in performing arts activities.

(4) Art and Emotional

Emotions and feelings are common in human life. There are two types : Positive emotions and Negative emotions. Emotions and feelings are very important to creating art and also related to aesthetics as well. When receiving a stimulus, there will be a feeling. Then there is thought, perception forward to imprint and it becomes a memory that can develop into a vision or imagination.

In addition to the relationship in terms of how emotions contribute to the creation of art. The creation of art also contributes to the promotion and support of human emotions. In this aspect, Pupink Mettanaitam (2016, 1-10) stated in her thesis that artistic process can be a tool to soothe and lull the mind, distracting from pain and anxiety. Art is not really a form of communication but a sound that echoes from the inside. Art is not only an opening of a communication way between the inner world and the outer world, experience to experience, but also a tool that can actually be used for self-healing.

This process is the origin of art as a tool to heal human beings. with the idea that the creative process of making art works able to heal and improve life. It is a communication of feelings without words, can promote the mental growth of the individual; helps humans to understand themselves better and relax from overflowing emotions or psychological pain, found emotional balance including creating a sense of value in life. Art is therefore a central medium that allows humans to know and equal their own emotions as well as to relieve discomfort, stress, and inner peace which affects the body, emotions and spirit. Aesthetics in art will help to improve mood, stability, increase feelings of good, and develop self-respect including self-esteem.

(5) Punch Needle

Embroidery Pen or Rug hooking pen, it was invented by Americans in the late C. 19 developed from early carpet manufacturing methods. Later in 1886. Ebenezer Ross patented the first carpet embroidery tool “The Griffin” which enabled early carpet makers to produce rugs faster. This can be done by pinning the head of the needle onto the fabric. When pulled back, there will be a small loop and it is the surface of the carpet on the back. Later it evolved into a more simple tool in the form of an embroidery pen.

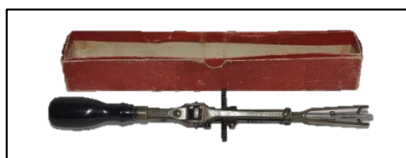


Figure 3 “The Griffin” The first carpet embroidery tool.

Source : <https://www.pinterest.com/pin/46865652345093996/>



Figure 4 Adjustable Punch Needle

Source : Creator (2021)

3.2 Creative Framework

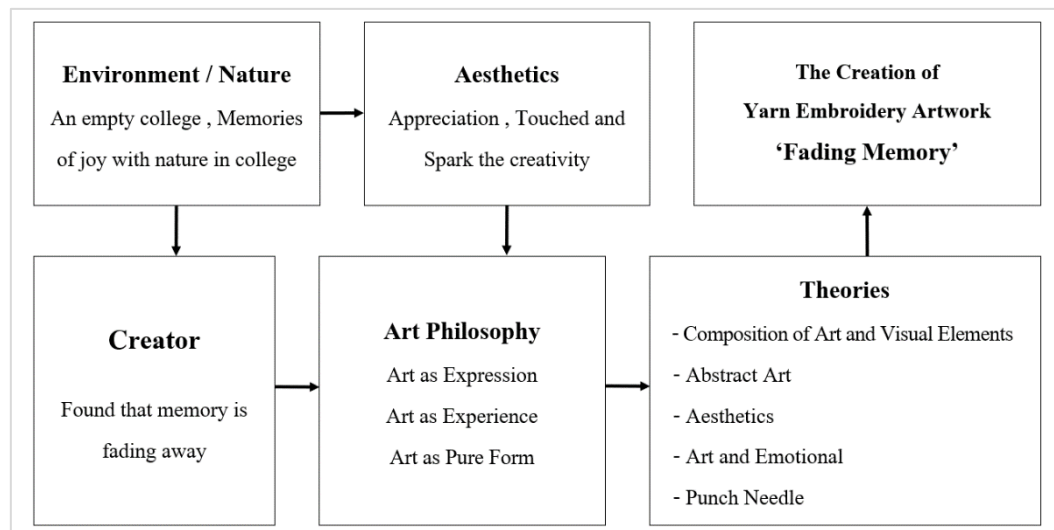


Figure 5 Creative Framework, Source : Creator (2021)

The creation of embroidery artwork "Fading Memory" is an artwork with 2 pieces of frame work size 50 x 50 cm. that present feelings about fading memory and also aesthetics from the creation. It will show the dominant features through various scopes as follows.

1. Content : To convey memories, transmit feelings and create aesthetics in abstract art through the visual elements and embroidery process with punch needle.
2. Form : To presents artworks in abstract style by express feelings through visual elements.
3. Technical and Method : To presented through the embroidery process with a punch needle.

4. Methodology

4.1 Creative Methodology

- (1) Study and research information from books, documents, textbooks and related research.
- (2) Screening and analyzing all data for use in creating artworks
- (3) Create sketch
- (4) Prepare materials and equipment for creating artworks.
- (5) Expand the sketch by creating a real size artwork.
- (6) Summarize and discuss for the result.
- (7) Publish artworks by journal

This artwork would transmit the memory of the joy moments among greenery and nature in college that were fading away including the creative process by using methods that the creator have skills in abstract style, therefore choose to express it through the visual elements.

The five elements are lines, shapes, colors, space, and textures. The lines used are straight lines and curved lines. About shapes, basic geometric shapes were chosen, namely circles to make the work look simple

and also put some of organic shapes to make the artwork have more independence and not hardened. After putting colors on an artwork, it appears spaces that reduce density and balance. In the use of colors, green was chosen to be the main color and also with some red, pink, orange and yellow that come from plants and flowers in college. Then make the gradient of green to white, from the middle spread out to the border. On the texture, it was chosen to emphasize the level of the surface that is created by the adjustable punch needle and makes the work have different levels of texture. And also have difference type of texture. The art work has 2 pieces and connects with wood sticks and dry leaves that found in a garbage dump at college.

4.2 Create sketch



Figure 6 Sketch , Source : Creator (2021)

4.3 Prepare materials and equipment for create artwork.



Figure 7 Yarns, Equipment, Natural dry wood stick and, Fabric Frames (50x50 cm./pieces)

Source : Creator (2021)

4.4 Experiment on textures.



Figure 8 Texture experiment

Source : Creator (2021)

4.5 Embroidering yarn on fabric by using punch needle



Figure 9 The creation of “Fading Memory”

Source : Creator (2021)

4.6 Put the natural material on artwork by sewing.



Figure 10 Sewing the dry wood sticks and dry leaves to connect pieces of artwork.

Source : Creator (2021)



Figure 11 Complete Artwork “Fading Memory”, Source : Creator (2021)

5. Creative Result

The creation of an artwork “Fading Memory” was made to create a yarn embroidery artwork that begins with an inner feeling due to the pandemic crisis of COVID-19 that is causing the sad and lonely feeling. The artwork will convey memories by extracting nature form and using visual elements into abstract art as follows.

Lines in this artwork are straight lines that have the characteristics of transmitting strength, stability, certainty, orderliness and simplicity, and curve lines have the characteristics of transmitting movement, smooth, continuing, spread out. When lines are combined together, it makes artwork not complicated including the composition in a symmetrical that makes the artwork to be balanced, clean and beautiful with unity. And there is the independent line from the natural dry wood stick, that chosen to be placed in the middle of the work to create a highlight and represent the place of memories that was the beginning of the creation of this piece. When placed it in the middle of the two embroidery pieces, the branches act as fasteners or connectors to bring these memories back together, like it is trying to bring back the happiness of the old life. But itself is a dry stick, dead branches, and therefore able to communicate about wither, lonely and depressed under these circumstances as well.

In terms of colors, it focused on the use of green, which’s the main color of trees, plants, and also put some red, pink, orange and yellow that come from flowers in college. Green and red are complementary colors. It was chosen to arrange it close together to make the work look bright and cause the points of interest to be as well. Then make the gradient by starting at the green that appears in the middle of the work and fading to white like it spread out to border by following the straight lines. These kinds of colors that chosen to use represent the joy

memories of college's life in normal situations that are fuzzy and seem like slowly fading away. It ends at the border of the work with white that can relate to the fear of the creator, who is afraid it will completely forget in one day as in the picture.

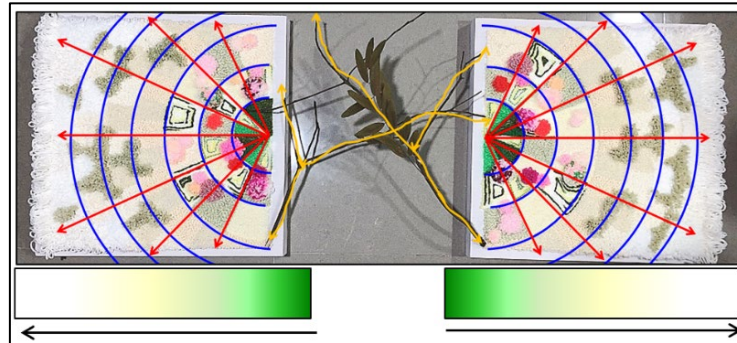


Figure 12 Direction of lines and gradient colors in artwork, Source : Creator (2021)



Figure 13 Flowers and plants in college into the artwork, Source : Creator (2021)

On the texture, yarn was chosen for this creation due to personal interest and skill. Using the process of embroidering yarn with punch needles that can adjust length so it can create a variety of textures and levels of it. The creators gradually increased the height of the threads, with thickness increasing as the color became lighter. To show the nature of the augmentation or ingestion of memories of college happiness that fades over time. as in the picture.

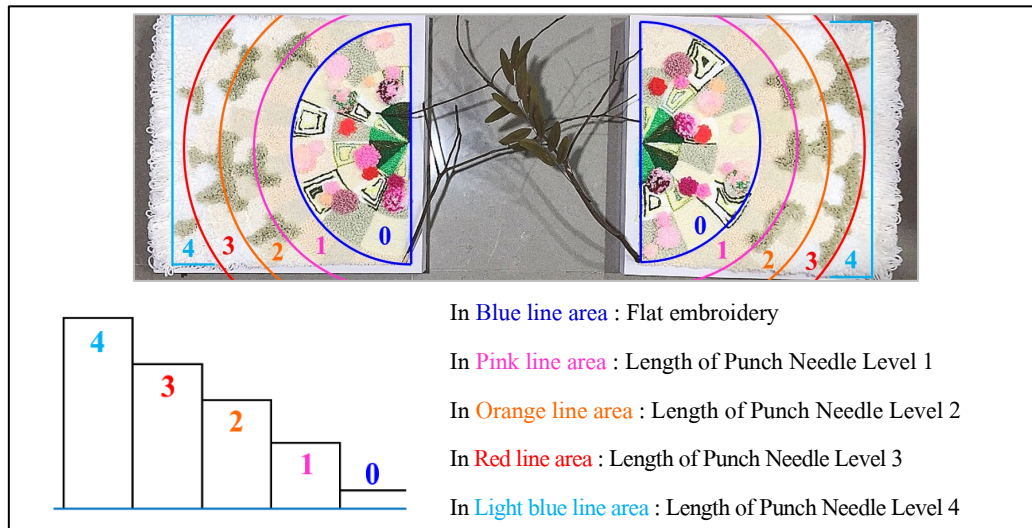


Figure 14 Area of texture levels in artwork, Source : Creator (2021)

And in the light green free-form part that appears in the white space. The creators wanted to extract the mossy shape commonly seen on floors or walls with high humidity. Most often it is a deserted area. Inactive and residential the creators found it on the brick floor at the college and apparently it grew in number. The creators created a loop cut surface in that light green area. to differentiate from the white background and be close to the real moss as in the picture.

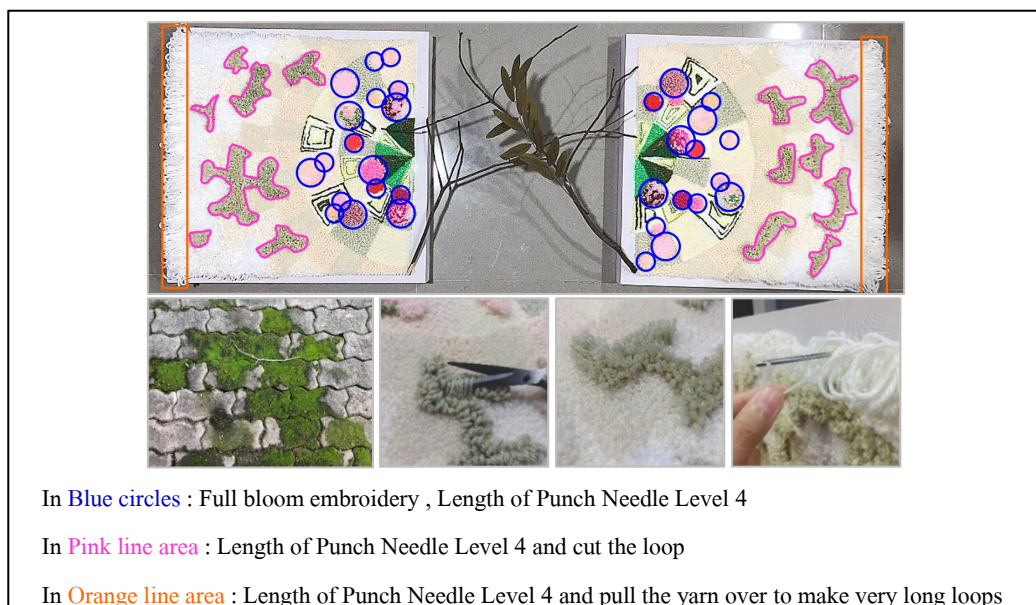


Figure 15 Area of various type of texture in artwork, Source : Creator (2021)

In addition to visual elements and abstraction, this artwork is also created aesthetics through the embroidery process with punch needle. It is a process that requires repetition to achieve the desired results calming, corresponds to the relationship between artistic creation and human emotions that being relaxed and get

into aesthetics state. It also provides aesthetics to both the creator and the audience. Therefore, it is considered a method that allows creation to meet all objectives that could affecting the perception of the audience in connecting the artwork with the inspiration and may be linked to personal experiences such as simplicity, euphoria, personal stuffs or happiness that will bring them in to aesthetics moment in thought and most importantly may spark creativity in the audience and bring them start doing their own creative work. In this case, this statement will come up, achieve the ultimate goal and it is the most beneficial to the Thai contemporary art industry as pictured here.

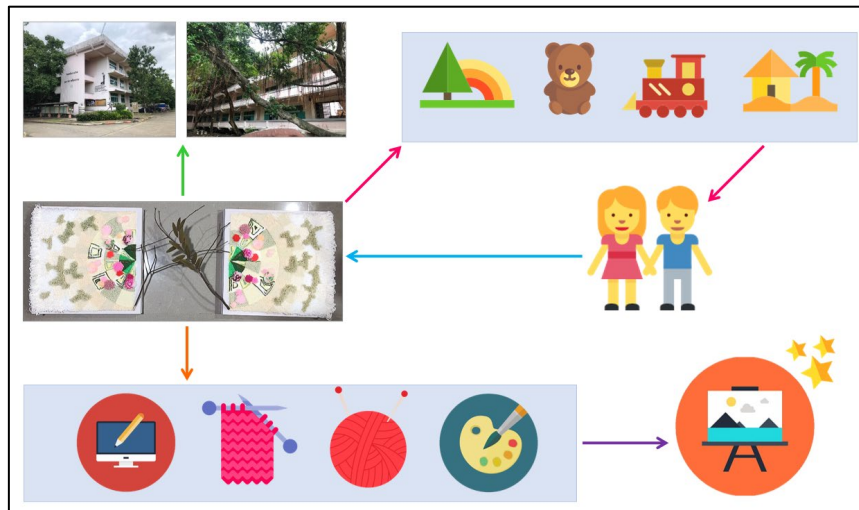


Figure 16 The perception and connection of artwork and the audience, Source : Creator (2021)

6. Discussion

The creation of artwork "Fading Memory" was making in about 70 hours and intended to transmit colors and textures through the plane of 2D fabrics embroidered with yarn in an abstract style and during the creation of artwork, it is a process that requires repetition corresponds to the relationship between artistic creation and human emotions that being relaxed and get into aesthetics state. This result in a complete artwork in both the presentation of the look and the creative process. It is a simple abstract style creation mixed with real nature material. It gives gentle and simply through the yarn and artistic composition of straight and curved lines and it also allocates space and creates a symmetrical balance, making the work orderly. Both fresh colors and gradients of green to white, it gives a feeling of joy in the past, acceptance the truth and hope to be back into normal life again. And also have to create texture in many levels through the unique function of the device that can adjust the length of the needle like a punch needle that is the favorite method. Then mixed with the real nature material in to the artwork, make them to be connector and joint separate part of the artwork become a complete piece and became a unique identity. Through the abstract presentation, might create an awareness of the value of abstract art. The fundamental theories in art are visual elements and art composition. The use of yarn might create the value of common materials and simple creative methods like embroidery, as well as the aesthetic value of life in which creators received while working on this artwork. Resulting in aesthetics, satisfaction, peace, and happiness.

This might give hope to everyone during times of being isolated from normal life and living in this hard time of the pandemic crisis and just want to the normal life come back soon.

7. Suggestion

(1) Should put more natural material and connect them more by making them to be a part of an artwork by sewing, tying, knitting, lacing or tying that might make artwork look more interesting.

(2) Experiment more about create texture by using an adjustable length punch needle.

(3) The characteristics of obtaining aesthetics from creative work by embroidery may be able to continue the study on the treatment of various conditions that result in problems in living with art or art therapy.

8. References

- Khamkheao, W. (2020). *Aesthetics*, 2nd Edition, Bangkok : Bangkok Block Part., Ltd.
- Kramer, T. (2010). *The History of Punch Needle, Punch Needle from a Historical Perspective* [Online], Retrieved August, 8, 2021 from <http://www.articlesfactory.com/articles/hobbies/the-history-of-punch-needle-punch-needle-from-a-historical-perspective.html>
- Mettanaitam, P. (2016). *Art as Therapy for Depression : A case of Metta Suwanasorn and Watcharaporn Yoodee* (Master of Fine Arts's thesis). Silpakorn University. Retrieved August, 8, 2021 from <http://ithesis-ir.su.ac.th/dspace/handle/123456789/1237>
- Nimsamer, C. (2016). *Composition of Art*, 10th Edition. Bangkok: Amarin Printing and Publishing Public Company Limited.
- Sunpongso, K. (2016). *Aesthetics art philosophy Theory of Visual Arts, Art Criticism*, 3rd Edition, Bangkok: Chulalongkorn University Press.
- Sunpongso, K. (2015). *Modern Art*, 2nd Edition, Bangkok : Chulalongkorn University Press.
- Torch, M. C. (2020). *The History of Punch Needle Rug Hooking* [Online], Retrieved August, 8, 2021 from <https://www.punchneedle.world/all-about-punch-needle/the-history-of-punch-needle-rug-hooking>

RELIABILITY AND VALIDITY OF THE THAI VERSION OF THE PROSTHESIS EVALUATION QUESTIONNAIRE

Waraporn Anyapho

Department of Preventive and Social Medicine, Faculty of Medicine Siriraj Hospital,

Mahidol University Bangkok, Thailand

E-mail: Waraporn.taaki@gmail.com

Piyapat Dajpratham

Department of Rehabilitation Medicine, Faculty of Medicine, Siriraj Hospital,

Mahidol University Bangkok, Thailand

E-mail: Piyapat.daj@mahidol.ac.th

Weerasak Muangpaisan

Department of Preventive and Social Medicine, Faculty of Medicine Siriraj Hospital,

Mahidol University Bangkok, Thailand

E-mail: drweerasak@gmail.com

Sutat Pattaravoratham

Department of Rehabilitation Medicine, Bangkok Metropolitan Administration General

Hospital Bangkok, Thailand

E-mail: patkiang@hotmail.com

Ms.Marisa Amattayakul

Sirindhorn School of Prosthetics and Orthotics Faculty of Medicine Siriraj Hospital,

Mahidol University Bangkok, Thailand

E-mail: marisa.ama@mahidol.edu

ABSTRACT

The aim of this research was to develop the PEQ - Thai version, which was acceptable validity and reliability for Thai lower limb amputees who fitted with the prosthesis in both the clinical and research fields. This study was a cross-sectional study. The sample was eighty-three lower limb amputees. The instruments used were the Thai version of the PEQ and the SF-36 (a generic Quality of Life outcome measure). Data were collected using the PEQ and SF-36v2 at baseline (n=83) and after two weeks (n=71). Reliability data were analyzed using Cronbach's alpha and Intraclass Correlation Coefficients (ICC). Pearson's correlation coefficient between the PEQ -Thai version and SF-36 was analyzed for concurrent validity. Major research findings indicated mean scores

of the 10 scales varied from 69 to 80. Overall Cronbach's alpha coefficients ranged from 0.77 to 0.86, indicating good internal consistency in all subscales. Intraclass Correlation Coefficients (ICC) ranged from 0.55 to 0.76 for all 9 PEQ scales, indicating acceptable correlation coefficients. The result of the study presented low correlation coefficients between the PEQ and the SF-36. The ambulation subscale correlated with the physical function subscales of SF-36 ($r=0.43$). Furthermore, the PEQ's social burden subscale score correlated with the SF-36's role emotional subscales ($r = 0.40$). The results lead to conclude that the Thai version of the Prosthesis Evaluation Questionnaire is valid and reliable for evaluating the quality of life of lower limb amputees in both clinical and research fields.

Keywords: Lower limb amputees, Quality of life, The quality of life of lower limb amputees, Prosthesis Evaluation Questionnaire

1. Introduction

In Thailand, A previous study of the quality of life of lower limb amputees has been variously reported by using general instruments because of have not had a specific instrument to measure the quality of life. Health-related outcome measurement tools available, there are only a few suitable for use in a prosthetic clinical setting.

2. Research Objective

To develop the Prosthesis Evaluation Questionnaire - Thai version, which has accessible reliability and validity in lower limb amputees who have fitted with the prosthesis.

3. Literature Review

3.1 Theory, Concept and Related Research

A systematic review of function and quality of life assessment after major lower extremity amputation presented that the Prosthesis Evaluation Questionnaire is one of the best quality of life measurement tools for lower limb amputees.¹ The Prosthesis Evaluation Questionnaire (PEQ) is a health-related quality of life outcome measurement tools (OMT) for persons with a lower limb amputation, which was developed by the Prosthetics Research Study (PRS).² The Prosthesis Evaluation Questionnaire consists of 82 items subdivided into 9 scales related to 4 sectors: 1) prosthesis function 2) mobility 3) psycho-social aspects 4) well-being .

To date, developed countries have produced generic and specific quality of life measurements for a long time. Several tools have been translated into other languages. However, the measurement tools have not been written in Thai for use in countries within the cultural context of Thailand because the process of producing the measurement tools is difficult. In addition, some Thai researchers have graduated from abroad, especially in Western countries, which mainly use the English language. Therefore, they prefer to translate the measurement tools for use in their research. The translated tools should have evidence of the translation techniques used or testing carried out on the new tools. Also, an outcome measurement tool that is translated from the source language

to the target language contains errors that may distort the intent of the tool. It is likely that the translated version will not be equal to the original version or will not apply to the target population. So, the validity and reliability of the Prosthesis Evaluation Questionnaire are clinically essential.³

3.2 Research Framework

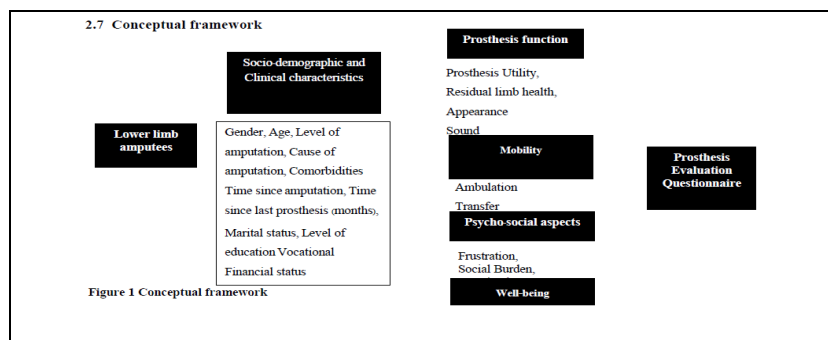


Figure 1 Research Framework

3.3 Research Hypotheses

The Prosthesis Evaluation Questionnaire Thai version has validity and reliability and is suitable for lower limb amputees who have fitted with the prosthesis.

4. Research Methodology

4.1 Research Design

Study design of this research is a cross-sectional study. The aim of the study was to develop a quality of life measurement for lower limb amputees who attend to Sririraj Hospital, Sirindhorn National Medical Rehabilitation Institute, Veterans General Hospital, Sunpasitthiprasong Hospital, and Roi-ET Hospital.

4.2 Population and Sample

Population are lower limb amputees who attend a regional outpatient prosthetic rehabilitation service, Sririraj Hospital, Sirindhorn National Medical Rehabilitation Institute, Veterans General Hospital, Sunpasitthiprasong Hospital, and Roi-Et Hospital. The participants were lower limb amputees with inclusion criteria as follows; being over 18 years of age, having used their current prosthesis for at least 6 months, being able to read and write Thai language, having stable medical condition.

4.3 Research Instrument

The Prosthesis Evaluation Questionnaire – Thai version (PEQ-TH) consists of 82 items subdivided into 9 scales related to 4 sectors: 1) prosthesis function 2) mobility 3) psycho-social aspects 4) well-being. PEQ has been used in many published research activities across the world and has been cross-culturally translated and adapted into a numerous of language. Seventy-six of 82 questions of PEQ is a visual analog scale with scores expressed in millimeters (0–100 mm). A higher number toward the right will correspond with a more positive

response. To calculate any of the scale scores were computed by the arithmetic mean of all the questions. A high score presents a better quality of life.²

Besides, the PEQ contains many individual questions which are not meant to be included in the scale scores. These are consisting of satisfaction in particular situations 3 items, specific body sensations (stump pain, phantom limb, non-painful sensations, etc.) 16 items, prosthetic care 3 items, self-efficacy (i.e. the ability to do daily activities under difficult conditions) 3 items, and the importance of different aspects of experience with the prosthesis 10 items. The PEQ does not include standard demographic questions. Moreover, the scoring and interpretation results of the PEQ assessment, the format, and cutting scale, which have questioned both negative and positive are in the process of development.²

4.4 Data Collection

This study was conducted from June 2020 to January 2021. After the informed consent was obtained. The demographic data, PEQ and SF-36 were administered within 1 hour to test concurrent validity and returned the questionnaire to the researcher. After that the participants were asked to participate the re-test process. If subjects are not convenient to come, the researcher would provide a post with a stamp and write the name-address of the researcher. The participant can send it back by post within 2 weeks after the first assessment is completed. After 2 weeks, PEQ was administered within 45 minutes to test-retest reliability and returned the questionnaire to the researcher. If the subject did not return the questionnaire within 2 weeks the phone call was made as a reminder.

4.5 Data Analysis Data Analysis

The research was conducted on a Cross-cultural translation, and data collection for the validity and reliability test of the questionnaire. The Prosthesis Evaluation Questionnaire was translated according to a step guideline for cross-cultural adaptation of self-report measure of Guillemin et al.⁴ All data were recorded on a computer database and analyzed using the Statistical Software (SPSS) Version 18. The demographic: the demographic was presented as descriptive statistics. Data were reported as a percentage and frequency for categorical variables, and mean \pm Standard deviation (SD) for continuous variables. Content Validity Expert committee review: The Item Objective Congruence (IOC) Index is used to determine the content validity. In each item, the experts are asked to determine the content validity score: The score = +1, if the expert is sure that this item really measured the attribute. The score = 0, if the expert is not sure that the item does measure or does not measure the expected attribute. The score = -1, if the expert is sure that this item does not measure the attribute. The qualified items should have the IOC equal to or greater than 0.50⁵ Concurrent validity: Concurrent validity was assessed in baseline data by evaluating a priori defined the correlation between subscales in PEQ and SF-36⁵. Correlation coefficients of 0.35-0.50 were low expected, Correlation coefficients of 0.51-0.70 were expected, Correlation coefficients of 0.71-0.90 were high expected, and Correlation coefficients of 0.71-0.90 were very high expected.⁵ Internal consistency reliability: Cronbach's alpha was used to evaluate the internal consistency reliability. Cronbach's alpha coefficients of 0.65-0.70 were low interpreted as acceptable, Cronbach's alpha coefficients of 0.71-0.80 were interpreted as acceptable, Cronbach's alpha coefficients of 0.81-0.90 were interpreted as high acceptable, and Cronbach's alpha coefficients of >0.90 were defined as difficult to interpreted.⁵

Test–retest reliability: Intraclass Correlation Coefficients was used to evaluate the test–retest reliability. Intraclass Correlation Coefficients of <0.50 were interpreted as low acceptable, ICC of $0.5-0.8$ were interpreted as acceptable, and ICC of >0.8 were interpreted as high acceptable.⁵

5. Research Findings

The discrepancies between the original version, the forward translation, and the back-translated version were 71 points, which involved only minor re- wording of the question. These points were discussed, and appropriate changes were made to the translated version. After the expert committee review of the cross-cultural process, the Content Validity test of the questionnaire was performed. The result of the study showed that almost all items were acceptable. Eighty-three persons returned a signed consent form and a questionnaire, and Seventy-one of these persons also completed the retest. Twelve persons were excluded, caused they did not come for a secondary evaluation. Demographic, clinical, and social descriptions of eighty- three lower limb amputees presented in Tables 1.

The internal consistency was represented by Cronbach's alpha coefficient. Cronbach's alphas ranged from Well Being (WB) 0.77 to Sounds (SO) 0.86 as follows: AM=0.80, SB=0.81, AP=0.82, FR=0.80, PR=0.82, RL=0.83, SO=0.86, UT=0.80, and WB=0.77. (Table 2).

Test-retest reliability was examined by Intraclass Correlation Coefficients (ICC) at baseline and 14-day. ICC (95% CI) ranged from Frustration 0.547 (0.26,0.72) to Well-Being 0.760 (0.44,0.78). Three subscales showed acceptable test-retest values (RL, WB, and AM), and six subscales showed below an acceptable level (SB, AP, UT, FR, PR, and SO) (Table 3).

Concurrent validity was assessed at baseline by evaluating Pearson's Product correlation coefficients between PEQ and SF-36 subscales. The expected correlation coefficient was found between the PEQ Ambulation and the SF-36 Physical function ($r=0.43$). In addition, the correlation coefficient was found between the PEQ Social burden and the SF-36 Role Emotional ($r=0.40$) (Table 4).

Table 1. Demographic characteristics

Variables	Mean (SD)	N (%)
Sex (n =83)		
- Men		63(75.90%)
- Women		20(24.10%)
Age, years (n = 81)		
- Less than 31 years		16(19.80%)
- 31 - 40 years		5(6.20%)
- 41 - 50 years		17(21.00%)
- More than 50 years		43(53.00%)
Marital status (n = 81)		
- Single		29(35.80%)
- Married		44(54.32%)
- Widowed or divorced		8(9.88%)
Educational level (n = 81)		
- Under Bachelor degree		70 (86.40%)
- Bachelor degree		11 (13.6%)
Work situation (n = 79)		
- Business/ Agriculturist		27(34.10%)
- Unemployed		15(19.00%)
- Private officer		13(16.50%)
- Government officer		12(15.20%)
- Student		7(8.90%)
		5(6.30)

Table 1. (Cont.)

Variables	Mean (SD)	N (%)
Financial status (n = 73)		
- Less than 9,000 baht		41(56.2%)
- 9,000 -15,000 baht		11(15.00%)
- More than 15,000 baht		21(28.8%)
Level of amputation (n =83)		
- Transtibial		54(65.00%)
- Knee disarticulation		11(13.25%)
- Transfemoral		17(20.50%)
- Hip disarticulation		1(1.25%)
Causes of amputation (n =80)		
- Trauma		47(58.75%)
- Infectious disease		14(17.50%)
- Peripheral arterial disease		10(12.50%)
- Tumor		4(5.00%)
- Other reason of amputation.....		5(6.25%)
Self-reported comorbidities (n = 80)		
- No comorbidities		53(66.25%)
- Diabetes		17(21.25%)
- Hypertension		6(7.5%)
- Other comorbidities.....		4(5.00%)
Time since amputation (n=77)		
- 6 months –2 years		17(22.10%)
- More than 2 years – 5 years		14(18.20%)
- More than 5 years		46(59.7%)
Time since prosthesis use (n = 80)		
- 6 months –2 years		21(26.25%)
- More than 2 years – 5 years		13(16.25%)
- More than 5 years		46(57.5%)

Table 2 Analysis of the internal consistency of PEQ scales. (Mean score, standard deviation and internal consistency of the PEQ score)

PEQ scales	Items	Mean + SD	Cronbach's alpha
Sounds (SO)	2	69.46 + 25.88	0.86
Residual Limb Health (RL)	6	69.25 + 17.26	0.83
Perceived Response (PR)	5	79.89 + 12.82	0.82
Appearance (AP)	5	69.56 + 15.22	0.82
Social Burden (SB)	3	76.89 + 17.99	0.81
Frustration (FR)	2	80.79 + 18.11	0.80
Ambulation (AM)	8	73.98 + 18.10	0.80
Utility (UT)	8	70.73 + 14.58	0.80
Well Being (WB)	2	75.01 + 17.96	0.77

Table 3 Test–retest reliability of PEQ scales. (Mean score, standard deviation and ICC (95% CI) the PEQ score)

Subscale	n	Baseline (Mean + SD)	14 days (Mean + SD)	Mean difference	ICC (95% CI)
Well-Being (WB)	68	74.73+18.59	76.40+19.14	1.67	0760 (0.44,0.78)
Ambulation (AM)	71	73.60+16.83	75.84+17.69	2.24	0.737 (0.58,0.84)
Residual Limb Health (RL)	70	67.52+18.89	74.07+17.54	6.56	0719 (0.55,0.83)
Social Burden (SB)	69	76.73 +17.99	79.17+17.92	2.44	0657 (0.45,0.79.)
Sounds (SO)	71	68.23 +27.01	69.25+23.56	1.02	0652 (0.44,0.78)
Perceived Response (PR)	70	80.15+12.60	79.90+16.39	-0.25	0636 (0.41,0.77)
Appearance (AP)	71	68.14+15.39	70.76+17.73	2.62	0589 (0.34,0.74)
Utility (UT)	71	67.75 +17.69	72.31+16.33	-4.56	0583 (0.33,0.74)
Frustration (FR)	67	78.84+20.89	76.51+23.36	-2.32	0.547 (0.26,0.72)

*Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

Table 4. Pearson's Product correlation coefficients between PEQ and SF-36 domains.

	Physical Function	Role Physical	Body Pain	General Health	Vitality	Social Function	Role Emotional	Mental Health
Utility (UT)	0.14	-0.16	0.30**	-0.16	-0.27	0.02	-0.08	-0.32**
Appearance (AP)	0.05	-0.02	0.12	-0.20	-0.19	0.03	0.06	-0.36**
Sound (SO)	-0.04	0.05	0.13	0.05	0.18	-0.02	0.06	0.02
Residual limb health (RL)	0.08	-0.04	0.30**	0.05	0.03	0.23	-.02	-0.12
Perceived response (PR)	0.15	-0.04	0.17	-0.10	-0.36**	-0.07	-0.19	-0.23*
Frustration (FR)	0.14	0.02	0.18	-0.09	-0.20	0.06	-0.15	-0.25*
Social Burden (SB)	0.30**	-0.00	0.27*	-0.16	-0.33**	-0.03	0.40**	-0.35**
Ambulation (AM)	0.43**	-0.05	0.36**	-0.23*	-0.31**	-0.06	-0.31**	-0.43**
Well-being (WB)	0.26*	-0.13*	0.32**	-0.17	-0.25*	-0.01	-0.26*	-0.39**

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

6. Discussion

The Prosthesis Evaluation Questionnaire (PEQ) Thai version is developed through the process of a Cross-cultural translation, and adaptation from the original of Prosthetic Evaluation Questionnaire. The PEQ Thai version had good internal consistency, and acceptable test retest reliability. The ambulation subscale correlated with the physical function subscales of SF-36 ($r = 0.43$). Furthermore, the PEQ's social burden subscale score correlated with the SF-36's role emotional subscales ($r = 0.40$). The results lead to conclude that the Thai version of the Prosthesis Evaluation Questionnaire is valid and reliable for evaluating the quality of life of lower limb amputees in both clinical and research fields.

7. Suggestion

Take care of copying the forms to assure that photographic reduction or enlargement has not occurred. Moreover, the scoring and interpretation results of the PEQ assessment, the format, and cutting scale, which have questioned both negative and positive are in the process of development. The author recommended making several adjustments, including changing the analog format of the scale to a numerical one and opting for an oral administration of the questionnaire.

8. Acknowledgement

This research is part of a master's thesis at the Faculty of Graduate Studies, Mahidol University, Thailand. Permission was granted by the Prosthetic Research Study group (PRS) to translate the PEQ into Thai

language and the Faculty of Medicine Siriraj Hospital, Mahidol University, for funding this research project (Grant Number (IO) R016331054). The funder had no role in the design, preparation, or outcomes of this study.

9. References

1. Alexander T. Nguyen Boston and Charlestown, (2014). A Systematic Review of Functional and Quality of Life Assessment after Major Lower Extremity Amputation. *Massachusetts*, 28, 763-780.
2. Prosthetic Research Study. (1998). *Guide for the Use of the Pros- thesis Evaluation Questionnaire*. Seattle, WA: Prosthetics. Research Study.
3. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. *Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures*. 2000, 25 (24), 3186–3191.
4. Hilton A, Skrutkowski M. (2002). Translating instruments into other languages: Development and testing processes. *Cancer Nurs*, 25 (1), 1-7.
5. Oumtanee A. (2559). *Instrument Development for Nursing Research*. 2nd ed. Bangkok: Chulalongkorn University

TRIGGERING THE ENTREPRENEURIAL MINDSET OF STUDENTS AS PREREQUISITE FOR SUSTAINABLE BUSINESS SUCCESS

Hans Michael Guelich

Stamford International University, Thailand

E-mail: hans.guelich@stamford.edu

Ulrike Guelich

Bangkok University School of Entrepreneurship and Management

Edward S. Tang

Stamford International University, Thailand

Jarupat Wongsangiam

Stamford International University, Thailand

ABSTRACT

The need for entrepreneurial thinking and acting is a common feature in business environments for entrepreneurship, and the desire to become an entrepreneur demands for an entrepreneurial mindset to create sustainable business success. This empirical study aims to identify if perceptions towards entrepreneurship, startup intentions and own skill perceptions help achieve an increase in entrepreneurial mindset of students by participating in a ten-day international entrepreneurship summer school (IESS). The short academic program had a strong focus on the sustainability of entrepreneurial endeavors, meaning also to learn dealing with the risk of failing a startup. Utilizing a 360 degree questionnaire, adopted from assessing global student challenges since 2004 from Victoria University of Wellington, New Zealand, participating students were assessed in skill perceptions, confidence and their entrepreneurial mindset, among others. Our findings show the importance of increased skills and capabilities for the entrepreneurial mindset. However, the coincidence of displaying entrepreneurship as a path to follow while at the same time pointing at risks and outlining potential dangers for startup failure, tended to have a negative impact on the entrepreneurial mindset for students, who originally had startup intentions and considered successful entrepreneurship as a profession of high status.

Keywords: entrepreneurship education; entrepreneurial mindset; short academic programs; entrepreneurial intentions; skill perceptions.

1. Introduction

Entrepreneurs and their talents drive innovation, technological change and economic achievements, higher income of the population and societal well-being by transforming needs of achievements into economic growth (Landström and others, 2012). Evaluating entrepreneurship education proves to be a more complex process and some main categories center around program leadership, the commitment of involved professors and entrepreneurs as role models, university administrators and student engagement. Evaluation of entrepreneurship programs is limited and –if conducted- usually aims to understand students' learning outcomes and attitudes at the end of a specific program. Previous research indicates that regular assessments of study courses do not lead to an evaluation of their entrepreneurial skills and abilities program (Karlsson and Moberg, 2013). There is a research gap on how to build capabilities to become an entrepreneur with a profitable and sustainable business, serving UN Sustainable Development Goals, and which specific program details support the development of an entrepreneurial mindset in students that leads to sustained business success beyond the startup phase.

2. Objective

To identify if perceptions towards entrepreneurship, startup intentions and own skill perceptions help achieve an increase in entrepreneurial mindset of students by participating in a ten- day international entrepreneurship summer school (IESS).

3. Literature Background

Both entrepreneurs and intrapreneurs need to apply entrepreneurial behavior in business environments, which has led to demands for improved entrepreneurial skills to prepare them for times of challenges and uncertainty. Investments in human capital development in general and in entrepreneurial knowledge and skills in particular, are positively related to monetary and sustainable business success, such as firm size, firm profitability and firm growth and are a positive predictor of business survival and advancement (Zanakis and others, 2012). Entrepreneurship education research is growing with a continuing discussion, if entrepreneurship can be taught and how entrepreneurship courses should differ from traditional management courses (Karlsson and Moberg, 2013). With the advancement of digital technologies, the objective of entrepreneurship education is shifting towards creating 'actual' entrepreneurs. However, as raised by Tang (2021), one basic issue is if entrepreneurship can be taught as an independent discipline or rather as an integral part of other business disciplines. While many proponents (e.g. Elmuti and others, 2012) support the argument that entrepreneurship can be taught, the question arises which specific content needs to be conveyed. As the fundamental aim of entrepreneurship education is to equip students with the appropriate entrepreneurial skills, competencies, confidence and an entrepreneurial mindset in preparing them for their journey of business creation, the question what exactly needs to be taught (Tang, 2021) remains open, especially with a goal to increase the overall entrepreneurial mindset in students.

3.1 Entrepreneurship education

Neck and Greene (2011) point out that the current entrepreneurship education teaches students the process of exploiting business prospects with the assumption, that the business opportunity has already been recognized, leading to entrepreneurial intention and action. Nevertheless, current education has not conveyed the necessary entrepreneurial skills and competencies to students for such business endeavors. Neck and Greene (2011) describe four current practices of entrepreneurship education in higher education institutions in the world: (1) Education about entrepreneurship as the conventional form of entrepreneurship educational teaching, that is usually instructive with the main focus on sharing knowledge based on subject-led awareness about entrepreneurial ventures. (2) Education for entrepreneurship as an advanced form of entrepreneurship education that engages students in experiential tasks, inquiry-based projects to acquire entrepreneurial skills and competencies. (3) Education through entrepreneurship as a higher advanced pedagogy of teaching and learning, where students have the opportunity to perform actual entrepreneurial practices in an incubation setting. Lastly, (4) education in embedded entrepreneurship as an approach, that integrates entrepreneurship into courses of other disciplines or subjects for students to experience entrepreneurship directly within their discipline.

Undeniably, these four typologies of entrepreneurship education meet the learning objectives of entrepreneurial knowledge acquisition and raised awareness, the development of skills and competencies, and engagement in entrepreneurial practice. However, as entrepreneurial action is ambiguous, frustrating, stressful, intensive, uncertain, and lonely (Morris and others, 2012), it is therefore important to enhance the effectiveness of entrepreneurship pedagogy to improve the overall outcome and influence the entrepreneurial mindset as a whole. Especially for Thai higher education institutions, it is important to develop systems and administrations which can improve higher education quality at par with international standards. Only then, Thailand will produce quality graduates who are able to competitively and competently perform in national and global contexts (Mori, 2019). However, a research gap exists which specific indicators predict the general learning objectives of entrepreneurship education programs (Kim and others, 2020). To add to this stream of research, this study explores if a ten-day international online entrepreneurship summer school (IESS), a short academic program, with its courses and program details can increase the overall entrepreneurial mindset of students from different study backgrounds. Our study follows the classification of Bae and others (2014), referring to entrepreneurship education as targeting entrepreneurial attitudes, skills and mindset and to entrepreneurial intent as a desire to own or start a business.

3.2 Short academic programs

Academic programs of a duration of between 7 to 21 days with transferable credits have become more common in the last years. However, a research gap exists about what they aim to accomplish in entrepreneurship education (Maritz and Brown, 2012). Partly, this can be attributed to the inexplicit design of entrepreneurship education programs, leading to problems in implementation, monitoring, assessment, and output of these programs. The context in which an educational program is delivered might also have an impact on the outcomes. Most programs are typically offered by higher education institutions (Neck and Greene, 2011), although

entrepreneurship education also takes place in training and development courses. Previous findings show that university graduates who have taken entrepreneurship courses are more likely to choose entrepreneurship as a desired career choice and develop innovations, as entrepreneurship education influenced their entrepreneurial behavior and entrepreneurial intentions (Farashah, 2013). Maritz and Brown (2012) point to certain important content that should be incorporated and provided in entrepreneurship education programs: among others, an international student body, diversity, institutional dynamics, multiple learning and teaching processes, education level, and entrepreneurship setting. Especially the international experience in short-term programs tends to increase high comfort levels among participants and creates valuable experiences in deeper understanding of cultural and business management practices as an outcome (Mills and others, 1987). Educational outcomes derived from the short study program can lead to marketable skills including knowledge enhancement, attitude reshaping, and confidence improvement. Thus, we hypothesize that

H1: A short academic program in entrepreneurship with international participants has a significant positive impact on the development of the entrepreneurial mindset of students.

3.3 Entrepreneurial Intentions

Despite a general knowledge about the importance of entrepreneurship education for entrepreneurial intent, the outcomes of these programs may differ depending on the curricula and target audiences (e.g. Kim and others, 2020), thus complicating the replication of previous findings. Dohse and Walter (2012) describe individual-level entrepreneurial intention as the avenue of getting access to know-how and know-who, material support, need for achievement, need for independence, risk-taking propensity, work experience, opportunity perception, and knowledge. Despite advances in entrepreneurship education research, the impact of entrepreneurship education has not been rigorously measured. Results from an Iranian study show that the completion of one entrepreneurship course increases the likelihood of having entrepreneurial intent by 1.3 times with desirability of an entrepreneurial career and the perception of an entrepreneur's status in society as significant predictors of entrepreneurial intent (Farashah, 2013). Entrepreneurial intention is still the most widely used measure for the impact of entrepreneurship education and its purpose to develop entrepreneurial attitudes, skills and mindset (Bae and others, 2014). The abundance of research on the factors of entrepreneurial intention suggests that it is important to reinforce the disposition of aspiring entrepreneurs in pursuing business start-up through education (Dohse and Walter, 2012). Thus, we hypothesize that

H2: Startup intentions and a positive attitude towards entrepreneurship have a significant positive impact on the development of the entrepreneurial mindset of students.

3.4 Skills Perceptions

Already a single course in a small business institute is able to have a major impact on the students' entrepreneurial attitudes, as they learn and apply these attitudes. Appropriate student-centered education programs are able to change general attitudes toward entrepreneurship (Farashah, 2013). The positive effect of entrepreneurship education on entrepreneurial attitudes, such as skill perceptions, were confirmed for university students in several country studies, among others in the United Kingdom, China and Germany (Dohse and Walter,

2011, Farashah, 2013). Besides changing attitudes towards entrepreneurship, entrepreneurship education can promote positive social norms toward entrepreneurs by revealing a higher perceived social status of entrepreneurs and presenting entrepreneurship as a desirable career choice as well as conveying necessary startup knowledge and startup skills (Farashah, 2013). Skills are considered a resource of individual and organizational nature and enable an entrepreneur to have a competitive and productive advantage over other enterprises. Achieving skills development is a primary goal in higher entrepreneurship education. To enable students to cope with the currently rapidly changing business environment, not only in an entrepreneurial, but also in a professional and managerial setting, requires flexibility and problem-solving skills (Sousa, 2018). Entrepreneurship skills, management skills and leadership skills tend to be the three necessary skill sets to increase entrepreneurial capacities. Sousa (2018) identifies and recommends real-world cases, project-based learning and problem-based learning as a learning tool to create increased entrepreneurial capabilities. We therefore hypothesize, that

H3: An entrepreneur's skill and opportunity perceptions have a significant positive impact on the development of the entrepreneurial mindset of students.

3.5 Entrepreneurial mindset

A mindset as defined by Merriam-Webster is a “mental attitude or inclination”. To help substantiate the field of entrepreneurship research, Shane and Venkataraman (2000) sought to understand where opportunities derive from and how they are discovered, evaluated and exploited by the individuals, who act them. The “discovery, evaluation, and exploitation of opportunities” is the most widely accepted definition of entrepreneurship until today. An entrepreneurial mindset can therefore be defined as the inclination to discover, to evaluate, and to exploit opportunities (Bosman and Fernhaber, 2018). Entrepreneurial thinking differs from managerial or strategic thinking, as entrepreneurs use their logic and thinking processes to solve entrepreneurial problems under conditions of uncertainty. As noted by Sarasvathy (2001, p.9), “entrepreneurs are entrepreneurial, as differentiated from managerial or strategic, because they think effectually; they believe in a yet-to-be-made future that can substantially be shaped by human action; and they realize that to the extent that this human action can control the future, they need not expend energies trying to predict it”.

Besides a focus of entrepreneurship education on entrepreneurial intent, another important aspect is the impact on students' attitudes toward entrepreneurship by assessing how educational experiences might influence these attitudes (Kim and others, 2020). Fast changes in economic dynamics disrupt not only industries but also existing business models. As the acceleration of change increases, the need for discovery, evaluation, and exploitation of opportunities also intensifies (Bosman and Fernhaber, 2018). Aspiring and existing entrepreneurs have to navigate these dynamics, which demands an entrepreneurial mindset to be successful in the long run. With a strengthened and adaptable mindset, entrepreneurs might have a tool to avoid being among the many failures of startup enterprises. Therefore, entrepreneurship educators need a deep understanding of the driving factors that shape this entrepreneurial mindset to improve entrepreneurship education (Ngeek, 2012).

4. Research Methodology and Data

Data used in this study were collected in August 2021 among 62 participants from Stamford International University in the (online) International Entrepreneurship Summer School (IESS) at the Institute of Business Administration (IBA) in Karachi, Pakistan, which took place from August 4 to 15, 2021. Of the 62 participants, 13 were male and 49 were female bachelor students from Thailand with diverse national backgrounds, studying at Stamford University in Thailand. They came from the different study fields International Hospitality Management, International Business Management, and Logistics and Supply Chain Management. Pakistani students and students from other Asian countries, studying at IBA, also enrolled in the program. The ten-day program consisted of 28 sessions and 60 lecture hours in co-creation on program level of international institutions cross-country and cross-culture. The students were exposed to multiple international guest speakers from Pakistan, Thailand, Qatar, United Arab Emirates, Germany, South Africa, New Zealand, USA and Canada. Case studies and real world experience created bigger impact as, for example, the Harvard Case study on Siam Canadian Food was accompanied by a session with its founder and CEO Jimmy Gulkin. Real world experience was created through ‘meet the entrepreneur’ sessions. Other guest speakers bridged academia and practice. Certified coaches covered the three different dimensions of teaching, advising/mentoring, and coaching to enable students to work in high performing teams and to become better at what they do.

The 360 degree questionnaire used to assess the students from IESS was initially developed by Prof. Deb Gilbertson from Victoria University of Wellington and University of Otago Business School, New Zealand, who are hosting an annual Global Enterprise Experience (GEE) since 2004. The challenge content aims to develop skills as global leaders, creative problem solvers, social entrepreneurs, and as world citizens. GEE won a United Nations Alliance of Civilizations award for its global impact on growing leaders who can join forces across cultural divides to make a difference in the world. The Otago Business School as the ‘research base’ for GEE is one of a select group of 87 business schools worldwide to hold dual EQUIS and US-based AACSB accreditation status which ensures globally portable qualifications and GEE assessments that are recognized around the world, among others by the United Nations Educational, Scientific and Cultural Organization (UNESCO). One of the authors of this study is a GEE certified coach and part of the Global Enterprise Experience since 2019.

To evaluate the level of skill perceptions, confidence and entrepreneurial mindset of students after the short academic program, frequencies or means of variables were created. Linear regression analysis was used to answer the question whether perceptions towards entrepreneurship, startup intentions and own skill perceptions predict an increase in entrepreneurial mindset of students by participating in the 10-day IESS. In the model summary, R-Square, as overall measure of the strength of the association, determined the proportion of variance in the dependent variable, predicted from the independent variables. ANOVA was used to predict the dependent or outcome variable with an indication of the statistical significance of the regression model of less than 0.05. The dependent variable DV was “How do you self-evaluate your entrepreneurial mindset today in comparison than before starting studying at IESS?” The majority of the independent variables were answered on a 9-point

LIKERT scale from 0=failed, 1=very poor, 2=poor, 3=below average, 4=average, 5=above average, 6=good, 7=very good, and 8=excellent. Control variables were 'fear of failure' and 'gender'.

5. Results

53.8 percent of the participants knew another startup. Nearly all students reported to have better knowledge, skill and experience required to start a new business after IESS (94.6 percent) and to become an entrepreneurial employee (92.7 percent). Similarly high, 92.9 percent consider starting a new business a desirable career choice and 81.3 percent think that those successful at starting a new business have a high level of status and respect in Thailand. More than half of the students (53.2 percent) say that it is difficult to start a business in Thailand and 42.6 percent fear to fail in starting a business. With an average of 4.0, the indicators for an increase in confidence level, skills perceptions and entrepreneurial mindset showed above average means of 5.7, 5.9 and 6.1, respectively. The overall model was significant and the adjusted R Square values exhibit that a variance of 63.3% in the overall model summary is accounted for by the students with regard to an improved entrepreneurial mindset after the IESS (Table 1).

The objective of this study to find determinants for an increased entrepreneurial mindset was met in three variables. (1) The regression results show significance for 'How do you self-evaluate your skills and ability to create a business now after the IESS than before?' with a strong relationship (.602/.006 in Table 1) which supports hypothesis *H3: An entrepreneur's skill and opportunity perceptions have a significant positive impact on the development of the entrepreneurial mindset of students*. On the other hand and contradicting our hypothesis *H2: Startup intentions and a positive attitude towards entrepreneurship have a significant positive impact on the development of the entrepreneurial mindset of students*, are the findings that the two independent variables 'Do you consider starting a new business a desirable career choice? (-.369/.029)' and 'Are you, alone or with others, expecting to start a new business, including any type of self-employment, within the next three years after finishing your studies? (-.366/.025)' both show a negative relationship with the dependent variable and do not support an increase in entrepreneurial mindset. As only an increase in skills and business creation abilities proved to be relevant, *H1: A short academic program in entrepreneurship with international participants has a significant positive impact on the development of the entrepreneurial mindset of students*, can only be confirmed if this coincides with skills' and abilities' creation in the short academic program.

Table 1: Regression results with DV ‘How do you self-evaluate your entrepreneurial mindset today in comparison than before starting studying at IESS?’

Independent Variables and R Square	Adjusted R Square	Beta	Sig.
R Square .776	.633		
Before IESS, do you know someone personally who started a business in the past 2 years?		.078	.620
Do you consider starting a new business a desirable career choice?		-.369	.029
Do you think that those successful at starting a new business have a high level of status and respect in Thailand?		.102	.504
Do you often see stories in the public media / social media about successful new businesses in Thailand?		.151	.341
Are you, alone or with others, expecting to start a new business, including any type of self-employment, within the next three years after finishing your studies?		-.366	.025
How do you self-evaluate your entrepreneurial confidence level today in comparison than before starting studying IESS?		.166	.370
How do you self-evaluate your skills and ability to create a business now after the IESS than before?		.602	.006
Gender		-.071	.671
Would fear of failure prevent you from starting a business?		-.165	.333

6. Discussion and Conclusions

The objective of this exploratory study was to identify if perceptions towards entrepreneurship, startup intentions and own skill perceptions help achieve an increase in entrepreneurial mindset of students by participating in a ten-day international entrepreneurship summer school in entrepreneurship with a focus on sustainable enterprise success. Our results confirm Neck and Greene’s findings (2011), that an academic entrepreneurship program is able to increase skills and the perceived ability to create a business. In addition, the short program also led to a strong positive push for the students’ entrepreneurial mindset development, confirming Bae and others (2014), linking the entrepreneurial mindset to the educational outcome of entrepreneurship education. As the findings also indicate a far above average perception of having achieved entrepreneurial mindset, careful consideration has to be given to the reasons, why the high level of respect of entrepreneurs and the startup intentions have a negative impact on the mindset of the students. Since the program had a strong focus on the sustainability of entrepreneurial endeavors, students were confronted with the risk of failing a startup and its high probability of 80 to 90 percent -depending on the statistics used. Increasing entrepreneurial skills and capabilities and at the same time pointing at risks and outlining potential dangers, tends to have had a negative impact on those students who had startup intentions and considered successful entrepreneurship as a profession

of high status, confirming Morris and others (2012), that entrepreneurial actions are ambiguous, frustrating, stressful, and uncertain. Half of the students in the study feared to fail and considered it difficult to start a business in Thailand. They might think: What if they started and really failed? How would they perceive the status of an unsuccessful entrepreneur? Would it still be high or would it rather be very low in a culture where losing face is deeply engrained in the culture? We conclude that the coincidence of displaying entrepreneurship as a path to follow but also pointing out that these startups need to make an effort to be among the successful ones, led to a negative impact on the overall entrepreneurial mindset.

The findings are especially valuable for educators and higher education institutes. Since entrepreneurship education also needs to deal with the risks involved, educators can take away from this study, that –despite having increased skills, confidence and mindset for nearly all students- there is an interplay with an individual's fears and perceptions when it comes to the difficulties of sustaining an enterprise to survive the startup time and become an established enterprise. In future entrepreneurship education courses more input needs to be given to demonstrate real-life examples on how to encounter and overcome these difficulties as a startup, if educators want to strengthen students' entrepreneurial mindsets. The same applies for the status and respect of successful startups. It needs a more nuanced approach to what really makes an entrepreneur successful and has an impact on his/her high status. Would the students count a year of losses as losing status whereas on the other hand they might have gained new customers and have grown their startup?

These findings are novel in the way that entrepreneurship education to our knowledge has not yet looked at the interplay of mindset, fear to fail and sustainability of startup endeavors. It requires experience in starting up and having been able to sustain a business to be able to convey this experience, which calls for more input into a short academic program by entrepreneurial role models. As entrepreneurship education programs are shifting toward 'learning to become an enterprising person' and 'adopting an entrepreneurial mindset', educational content has to match this trend and introduce lifestyle, mindset, commitment and other required entrepreneurial skills to the current content. Educators need to do more than fostering startups for the sake of startups and neglecting the increasing demand in social change, sustainable enterprises and entrepreneurial mindsets.

Limitations of this study are the relatively small sample size of 62 students, thereof 79 percent female. Further investigation should be a comparison of the survey results of the Pakistani students' entrepreneurial mindset to the findings with the Thai students. Further studies should also investigate gender differences with regard to the influencing factors on entrepreneurial mindset as women tend to underestimate their own skills perceptions compared to men (Guelich, 2018). More clarity is needed why in an international summer school on sustainable entrepreneurship, which has the purpose to trigger entrepreneurial intent and mindset, the perceptions that entrepreneurship is a good career choice and startup intentions are negatively correlated to the development of the entrepreneurial mindset when all three indicators were perceived highly above average after the IESS. Investigating the interplay between skills perceptions, mindset and fear of failure with an outlook to sustain the startup beyond the startup phase might deliver valuable insights and findings with practical implications for future entrepreneurship education and academic short programs, respectively.

Acknowledgements: Dr. Shahid Qureshi, Muhammad Asghar Azmi and Team IBA, and Ricardo Lucio Ortiz, and Anelda and Morne Mail for collaboration in IESS.

7. References

- Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship theory and practice*, 38(2), 217-254.
- Bosman, L., & Fernhaber, S. (2018). Defining the entrepreneurial mindset. In *Teaching the Entrepreneurial Mindset to Engineers* (pp. 7-14). Springer, Cham.
- Dohse, D., & Walter, S. G. (2012). Knowledge context and entrepreneurial intentions among students. *Small Bus Econ*, 39, 877-895.
- Elmuti, D., Khoury, G., & Omran, O. (2012). Does entrepreneurship education have a role in developing entrepreneurial skills and ventures' effectiveness? *Journal of Entrepreneurship Education*, 15(1), 83-98.
- Farashah, A. D. (2013). The process of impact of entrepreneurship education and training on entrepreneurship perception and intention: Study of educational system of Iran. *Education+ Training*, 55(8/9), 868-885.
- Guelich, U. (2018). *GEM Thailand Report 2017/18*. Bangkok University, School of Entrepreneurship & Management (BUSEM); Retrieved September 25, 2021, from: <http://gemconsortium.org/report/50189>
- Karlsson, T. & Moberg, K. (2013). Improving perceived entrepreneurial abilities through education: Exploratory testing of an entrepreneurial self-efficacy scale in a prepost setting. *The International Journal of Management Education*, 11(1), 1-11.
- Kim, G., Kim, D., Lee, W. J., & Joung, S. (2020). The Effect of Youth Entrepreneurship Education Programs: Two Large-Scale Experimental Studies. *SAGE Open*, 10(3), 2158244020956976.
- Landström, H., Harirchi, G., & Åström, F. (2012). Entrepreneurship: Exploring the knowledge base. *Research policy*, 41(7), 1154-1181.
- Maritz, A., & Brown, C. R. (2013). Illuminating the black box of entrepreneurship education programs. *Education+ Training*, 55(3), 234-252
- Mills, L., Deviney, D., & Ball, B. (2010). Short-Term Study Abroad Programs: A Diversity of Options. *Journal of Human Resource and Adult Learning*, 6(2), Retrieved September 28, 2021 from: http://www.hraljournal.com/Page/previous_V6-2.htm
- Mori, Y (2019). *Efforts toward internationalization in Thai private higher education institutions*. The 14th National and International Sripatum University Conference Proceedings (SPUCON 2019). Retrieved September 16, 2021, from: <http://dspace.spu.ac.th/bitstream/123456789/6925/1/5.1%20-%205.2SPUCON2019%20Cover%20Content%20Mori%20pp%20104%20to%20114.pdf>.

- Morris, M., Schindehutte, M., Kuratko, D. & Spivack, A. (2012). Framing the Entrepreneurial Experience. *Entrepreneurship Theory and Practice*, 36(1), 11–40.
- Neck, H. M., & Greene, P. G. (2011). Entrepreneurship education: known worlds and new frontiers. *Journal of small business management*, 49(1), 55-70.
- Ngek, B.N. (2012). An exploratory study on entrepreneurial mindset in the small and medium enterprise (SME) sector: A South African perspective on fostering small and medium enterprise (SME) success. *African Journal of Business Management*, 6(9), 3364-3372.
- Sarasvathy, S. (2001). *What makes entrepreneurs entrepreneurial?* Darden Business Publishing.
- Shane, S., and Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217–226.
- Sousa, M. J. (2018). Entrepreneurship skills development in higher education courses for teams leaders. *Administrative sciences*, 8(2), 18.
- Tang, E. (2021). Framing a Pedagogical Model for Entrepreneurship Education. *ASEAN Journal of Management and Innovation*, 8(2).
- Zanakis, Stelios H., Maija Renko and Amanda Bullough (2012). Nascent entrepreneurs and the transition to entrepreneurship: why do people start new businesses? *Journal of Developmental Entrepreneurship*, 17(01), 1250001.

A STUDY OF ADULTS' BASIC SOCIAL SKILLS OF FOURTH-YEAR STUDENTS, DEPARTMENT OF JAPANESE FOR BUSINESS COMMUNICATION, SRIPATUM UNIVERSITY

Assistant Professor, Yasumasa MORI, Ph.D.

Department Chair, Japanese for Business Communication,

School of Liberal Arts, Sripatum University

E-mail: yasumasa.mo@spu.ac.th

ABSTRACT

The purpose of this paper was to clarify the basic social skills of working adults in the fourth-year students of Japanese for Business Communication Department, Sripatum University. A questionnaire survey on the basic social skills of working adults was conducted for 13 fourth-year students who had practical work experience in the second semester of academic year 2020. The basic social skills of working adults were based on three main skills (*Action, Thinking and Teamwork*) and 12 skill elements proposed by the Ministry of International Trade and Industry in 2006. The questionnaire was closed-ended questions, and divided into two parts: Part 1 was a self-diagnosis by students for 12 skills, and Part 2 was a multiple-choice question that asked which skills were required for practical training. Cronbach's coefficient alpha was 0.79 for Part 1 and Part 2. In Part 1, there were seven negative evaluations for 12 skills, however, positive evaluations were significantly higher in all the skills. In Part 2, one skill was not chosen, however, two skills were relatively high. Practical training is the best opportunity to acquire basic social skills for working adults, therefore, further practical research is expected in the future from the perspective of human resources education.

Keywords: Human resources, Practical work, Work experience, Adults' basic social skills, Sripatum University

1. Introduction

According to the Japan External Trade Organization's survey on trends of Japanese companies in Thailand, 2020, there are 5,856 Japanese companies in Thailand (JETRO, 2021b). The number of members of the Japanese Chamber of Commerce, Bangkok is 1,678 as of the end of April 2021 (JCC, n.d.), and in the Ministry of Foreign Affairs' *Survey of Japanese companies expanding overseas*, Thailand ranked fourth in the world in view of the number of Japanese companies by country (Ministry of Foreign Affairs of Japan, 2018). According to the 2020 statistics of the Board of Investment of Thailand (BOI), it was announced that Japan was the highest in terms of the amount of foreign capital's direct investment value in Thailand on both an application basis and on an approval basis (The Board of Investment of Thailand, 2021). From the above statistical figures, it can be said that the existence of Japanese companies in Thailand occupies an important position not only in Japanese economy but also in Thai economy. Based on this recognition, the economic relationship between Japan and Thailand, centered on Japanese companies in Thailand, is deepening closeness in various fields such as trade,

investment, and technology through the macro and micro levels. Under such a close economic relationship between Japan and Thailand, various businesses are developed in Thailand. On the other hand, the existence of Thai human resources with business Japanese proficiency is indispensable for these businesses. In other words, Thai human resources with business Japanese proficiency mean that it is important and necessary not only to have Japanese language skills like translation and interpretation, but also to advance, coordinate, and develop their work in cooperation with Japanese business person by using many of the linguistic skills and job performance skills.

As far as Japanese language is concerned, there are 40 higher education institutions that have major course for Japanese language in Thailand (Japan Foundation, 2018). There are only five departments named *Business Japanese*, and it accounts for only 12.5% of the total. However, there are 84 institutions offering Japanese language courses, including other courses than major courses (*Ibid.*). In addition, some Thai universities have internship or work experience programs, and some universities certify credits for practical training at company as regular course. At the same time, some universities have compulsory subjects in their curriculum, and some have stipulated as graduation requirements. Although not all Japanese language course graduates at these universities find employment with Japanese companies, it can be inferred that Thai universities with Japanese language courses and internship programs are contributing to the development and production of a certain number of Thai human resources with business Japanese proficiency and job performance skills in working with Japanese business persons. However, it is extremely important to grasp the current state of development of adults' basic social skills and the results of work experience programs at universities, rather than speculation or hypothesis. In addition, it seems that there are few surveys that have verified the basic social skills of Thai human resources with business Japanese proficiency. In conjunction with the content that was pointed out in chapter 4. *Research objective*, this paper reported the results of research on the work skills of the fourth-year students enrolled in the Department of Japanese for Business Communication (hereinafter referred to as JBC), Sripatum University (hereinafter referred to as SPU) from the viewpoint of developing the above-mentioned Thai human resources with business Japanese proficiency and job performance skills.

2. Significance of Research

Traditionally, educational institutions have played a social role in producing talented human resources in society. However, in the 21st century, with the phenomenon of globalization, more and more various abilities and skills are required for human resources development in educational institutions. Two aspects of *wide range of basic skills as members of society* are pointed out: sufficient conditions and necessary conditions (Suwa, 2011). The former sufficient conditions have the property of changing depending on the region, occupation, and era, while the latter necessary conditions are said to be common and basic skills that can be utilized in all of job categories and workplaces as a member of society who is able to respond to the global society (Suwa, 2006). In the light of the above concepts, it is meaningful to study the degree of achievement of students' basic abilities and skills for working adults through the students' own corporate training, through the achievement evaluation by educational institutions, and through the practical training evaluation by companies. This study is not only significant for students and faculty, but it is also understood to give opportunities in considering the direction of

human resources development of educational institutions and in responding flexibly to requests from companies related to human resources development from the viewpoint of industry-academia collaborative education.

3. Related Research

Entering the 21st century, in developed countries, there is ongoing debate as to social skills including new behavioral abilities or competencies required in society in terms of human resources education and human resources development. Some examples proposed as social skills were as follows: *Core/Key/Common skills* in the UK; *Transferable skills* in France; *Basic/Necessary skills* and *Workplace know-how* in the United States; *Employability skills* in Canada; *Key competencies* and *Generic skills* in Australia; *Essential skills* in New Zealand (Ministry of Economy, Trade and Industry, 2007, p.2). Although these various social skills have different names, it is said to be important and necessary skills for developing human resources persons who can play significant roles as members of society. As is the case with the developed countries mentioned above, in Japan, the Ministry of International Trade and Industry has advocated *Fundamental competencies for working persons* since 2006. *Fundamental competencies for working persons* are defined as *Basic social skills necessary to work with diverse people in the workplace and local communities*. Fundamental competencies were classified into three main skills: 1) *Skill to step forward* = Action, 2) *Skill to think through* = Thinking, and 3) *Skill to work in a team* = Teamwork. In addition, the 12 skill elements were set for these three skills: i) *Independent-minded stance*, ii) *Skill to make approaches to others* and iii) *Skill to get things done* in Action as a main skill, iv) *Skill to identify challenges*, v) *Skill to plan* and vi) *Skill to create* in Thinking as a main skill, and vii) *Skill to deliver a message to others*, viii) *Skill to listen attentively*, ix) *Skill to respond flexibly*, x) *Skill to get a grasp of situation*, xi) *A sense of discipline* and xii) *Skill to stress control* in Teamwork as a main skill. Based on these three main skills and 12 skill elements, different types of basic social skills checklists were created by various educational institutions or industrial associations including corporate organization. At the same time, these checklists are widely used in formal curriculum or career education at universities, and human resources education or human resources development in companies.

There are some cases that the basic social skills checklists for working adults are used at universities in connection with an internship in company (or work experience program). Yokoyama (2009) proposed a certification test to develop career skills, summarized the discussions on evaluation method, and expected that an evaluation sheet would be used in collaboration with students, universities, and companies. Matsuo (2015) clarified the significance of internship program by using the concept of basic social skills for working adults, and developed a concrete methodology for enhancing internship education. At the same time, he also mentioned the importance of acquiring basic social skills for working adults at university. Fujishima and Kajita (2017) conducted a questionnaire survey of students regarding the results of internship program in the context of the basic social skills of working adults, and presented future issues on the basic social skills of working adults acquired through internships in keeping with the results of the questionnaire. Kashima et al. (2019) outlined the practical content of project-type internships through industry-academia collaboration, and conducted a cross-sectional survey of social skills and basic skills of working adults as students' learning outcomes. Through the above research products, and in analyzing the outcome of company's internship or work experience, it is

understood that the check sheet related to various skills set in the basic social skills of working adults can be used in an internship program at Japanese company or in the process of working in collaboration with Japanese business person. Incidentally, a questionnaire survey in this research utilized the basic social skills checklist sheet that was created in line with the framework of adults' basic social skills for international students studying in Japan (International Students Support Network, 2010). This checklist sheet is still in use currently. The questionnaire was translated into Thai language after rewriting part of the wording.

4. Research Objective

The objectives of this research were the following three points: 1) to investigate achievement degree of adults' basic social skills through self-diagnosis and self-evaluation by the fourth-year students of the JBC Department who completed corporate training or similar work experience for a certain period, 2) based on the results of their self-diagnosis, it was to reveal adults' basic social skills that were fully achieved or not well achieved in practical training or work experience, and 3) to clarify what abilities or skills students deem important in their basic social skills for working adults.

5. Methodology

5.1 Target Group

The target group of this survey research was 13 fourth-year students who registered for courses in practical subjects of *JBC299 Work Experience* and *JBC499 Japanese for Business Communication Cooperative Education* in major course of the JBC Department in the second semester (January-April) of an academic year 2020. The 13 respondents consisted of 4 male students (30.8%) and 9 female students (69.2%) (Table 1).

Table 1 Breakdown of JBC299 / JBC499 students

Subject	Male	Female	Subtotal
JBC299	3 (23.0%)	5 (38.5%)	8 (61.5%)
JBC499	1 (7.7%)	4 (30.8%)	5 (38.5%)
Total	4 (30.8%)	9 (69.2%)	13 (100.0%)

5.2 Instrument

An instrument used in this survey research was questionnaire, and the questionnaire was multiple-choice questions. The questionnaire survey consisted of two parts. In Part 1, 12 question items were set, and self-diagnosis or self-evaluation was performed for each item. Respondents (= 13 students) chose one of four choices (ordinal scale: 4 = *Very well*, 3 = *Moderately well*, 2 = *Not very well*, and 1 = *Not at all well*) as a single-answer method and as an evaluation criterion for how well they were able to do it. The question in Part 2 was a multi-answer format, and respondents selected three from 12 skills that seemed important or necessary skills to practical training. As mentioned in chapter 3. *Related research*, the framework related to basic social skills for working adults (three main skills and 12 specific skills) advocated by the Ministry of International Trade and Industry in 2006 is still widely used in Japan as of 2021, therefore, it is judged that this questionnaire has sufficient content validity.

5.3 Data Collection

The questionnaire was conducted immediately after the debriefing session held on May 10, 2021 to present the results of practical work experience by 13 students. *Google Forms* was used to collect the answers to the questionnaire. The recovery rate was 100.0% and there were no invalid responses. The reliability of the response results was 0.97 for both Part 1 and Part 2 according to the confidence coefficient (Cronbach's coefficient alpha) for assessing internal consistency (Wessa, 2021). All the collected responses were analyzed by the basic statistics (Casio Computer Co., Ltd., 2021).

5.4 Data Analysis

Data analysis was proceeded from the standpoint of the behavior of 13 respondents in Part 1 and Part 2 below. The characteristics of the overall behavior were described in the data analysis.

5.4.1 Aggregate Results of Part 1 in Questionnaire

In the aggregated results of all answers in Part 1, 5 items with that of choice No. 1 (*Not at all well*) and No. 2 (*Not very well*) were not selected. The items were item No. 1, No.2, No. 6, No. 10, and No. 12 (Table 2). Otherwise phrased, these 5 items meant that only choice No. 3 (*Moderate well*) and No. 4 (*Very well*) were selected in evaluation stage.

Table 2 Aggregate results of Part 1 in questionnaire (Single answer)

	Item /Answer (Scale)	4	3	2	1	\bar{x}	SD
1	Could you think and proceed with your activities by yourself? / Did you work without saying "I can't do"? / Were you willing to act?	2 15.4	11 84.6	0 0.0	0 0.0	3.2	0.38
2	Did you actively engage in office activities? / Did you work with others? / Could you carry out activities while confirming and asking questions?	5 38.5	8 61.5	0 0.0	0 0.0	3.4	0.51
3	Did you propose your own opinion? / Did you work independently? / Did you think about your purpose and act?	2 15.4	10 76.9	1 7.7	0 0.0	3.1	0.49
4	Was it possible to properly distinguish between necessary information and unnecessary information? / Could you think and execute the process by yourself? / Did you check and review to prevent careless mistakes?	1 7.7	8 61.5	4 30.8	0 0.0	2.8	0.60
5	Did you sort out the problems and act? / Could you prioritize important points? / Could you plan and complete it within the deadline?	2 15.4	8 61.5	3 23.1	0 0.0	2.9	0.64
6	Did you try to work creatively according to the purpose of the task? / Did you create a new deliverable from references and related materials? / Did you create the deliverable not only by comparison and analysis but also by your own consideration?	3 23.1	10 76.9	0 0.0	0 0.0	3.2	0.44
7	At the time of the presentation, could you organize the issues and give an easy-to-understand explanation? / Could you convey the necessary information? / Could you get into the habit of reporting, contacting, and consulting?	1 7.7	11 84.6	1 7.7	0 0.0	3.0	0.41

Table 2 (Continued)

	Item /Answer (Scale)	4	3	2	1	\bar{x}	SD
8	Could you extract necessary information from other people? / Could you grasp what the other party wants to say? / Could you listen to opinions that were different from your own?	2 15.4	10 76.9	1 7.7	0 0.0	3.1	0.49
9	Did you come to think from the standpoint of the other party? / Could you respond in various ways depending on the situation? / Could you deal with differences in thinking methods and customs of different cultures?	3 23.1	8 61.5	2 15.4	0 0.0	3.1	0.64
10	Could you fully understand your role and work? / Were you aware of your good points and did you understand your division of roles? / Could you draw out the goodness of other people and think about the entire team?	6 46.2	7 53.8	0 0.0	0 0.0	3.5	0.52
11	Could you manage how to use office hour and activity time by yourself? / Did you meet the set deadline, such as submitting your report? / Could you act in accordance with social rules and manners?	2 15.4	10 76.9	1 7.7	0 0.0	3.1	0.49
12	Did you try to overcome with the cooperation of your colleagues in difficult times? / Did you hope for work positively even when you were tired or depressed. / Did you control your emotions?	4 30.8	9 69.2	0 0.0	0 0.0	3.3	0.48
	Total (156)	33	110	13	0	37.6	-
	Percentage (100.0%)	21.2	70.5	8.3	0.0	-	-
	Average (13)	2.75	9.17	1.08	0.00	3.1	-
	Standard deviation (SD)	1.54	1.34	1.31	0.00	-	3.31

* The scale value of evaluation criteria in table 1 indicates 4 = *Very well*, 3 = *Moderately well*, 2 = *Not very well*, and 1 = *Not at all well*, respectively. The upper number shows the number of respondents, and the lower number shows the ratio.

Choice No. 2, No. 3, and No. 4 were selected for 7 items of item No. 3, No. 4, No. 5, No. 7, No. 8, No. 9, and No. 11, and the ratio accounted for 58.3% of all 12 items. The highest ratio of choice No. 2 was item No. 4, and it accounted for 30.8%. Of all 12 items, choice No. 3 accounted for the largest proportion compared to other choices. Among choice No. 3, the minimum ratio was 53.8% for item No. 10 and the highest ratio was 84.6% for item No. 1 and No. 7. Among choice No. 4, only two items showed relatively high ratio, or 46.2% for item No. 10 and 38.5% for item No. 2. The remaining 10 items showed a ratio of 30.8% or less in choice No. 4 (item No. 1, No. 3, No. 4, No. 5, No. 6, No. 7, No. 8, No. 9, No. 11, and No. 12). When viewed from mean value of the four choices indicating the evaluation scale for each item, 2.8 points of item No. 4 showed the minimum value, and 3.5 points of item No. 10 showed the maximum value. The general average rating was 3.1 points, and it resulted in choice No. 3.

5.4.2 Aggregate Results of Part 2 in Questionnaire

In the summarized results in Part 2, 11 items excluding item No. 9 were selected from all 12 items (Table 3). No items accounted for the prominent proportion, i.e., showing a range from minimum of 2.6% (item No. 2) to maximum of 20.5% (item No. 8). The item with the second highest number after item No. 8 showing

20.5% was 17.9% of item No. 5, followed by 10.3% of items No. 7 and No. 10. Of the remaining 7 items, 3 items of item No. 3, No. 11 and No. 12 were 7.7%, 3 items of item No. 1, No. 4 and No. 6 were 5.1%, and item No. 2 was 2.6%.

Table 3 Aggerate results of Part 2 in questionnaire (Multiple answers)

No.	Skill content	Number	%	No.	Skill content	Number	%
	Skill to step forward (Action)	6			Skill to work in a team (Teamwork)	22	
1	Independent-minded stance	2	5.1	7	Skill to deliver a message to others	4	10.3
2	Skill to make approaches to others	1	2.6	8	Skill to listen to the opinions of others	8	20.5
3	Skill to get things done	3	7.7	9	Skill to respond flexibly	0	0.0
	Skill to think through (Thinking)	11		10	Skill to get a grasp situation	4	10.3
4	Skill to identify challenges	2	5.1	11	A sense of discipline	3	7.7
5	Skill to plan	7	17.9	12	Skill to control stress	3	7.7
6	Skill to create	2	5.1		Total	39	100.0

6. Research Findings

6.1 Features of the Answers in Part 1

According to the three main skills (*Skill to step forward: Action*, *Skill to think through: Thinking* and *Skill to work in a team: Teamwork*), the evaluation contents of each 12 individual skill (p.3) were reviewed with the tabulated results of Part 1. First, in *Action* (Skill to step forward), Skill No. 3 (to get things done) showed a slight evaluation of 2. *Not very well* (7.7%). However, Skill No. 3 accounted for 92.3% by combining 4. *Very well* (15.4%) and 3. *Moderately well* (76.9%). In *Action*, the item that highly evaluated as 4. *Very well* was Skill No. 2 (Skill to make approaches to others), and accounted for 38.5%. It was 23.1 point higher than Skill No. 1 (Independent-minded stance) and Skill No. 3 in 4. *Very well*. Next, in *Thinking* (Skill to think thorough), the evaluation was divided into three (4. *Very well*, 3. *Moderately well* and 2. *Not very well*) for Skill No. 4 (Skill to identify challenges) and Skill No. 5 (Skill to plan). Although the point discrepancy between the evaluation stages was different, it showed the rankings of 3. *Moderately well*, 2. *Not very well* and 4. *Very well*. In addition, the negative evaluation of 2. *Not very well* (Skill No. 4: 30.8% and Skill No. 5: 23.1%) was the highest among all 12 skills. Of the three skills in *Thinking*, the skill that was relatively high in both 4. *Very well* (23.1%) and 3. *Moderately well* (76.9%) was Skill to create of Skill No. 6. Finally, in *Teamwork* (Skill to work in a team), the skills that were evaluated as 2. *Not very well* were Skill No. 7 (Skill to deliver a message to others: 7.7%), Skill No. 8 (Skill to listen attentively: 7.7%), Skill No. 9 (Skill to respond flexibly: 15.4%), and Skill No. 11 (A sense of discipline: 7.7%). The highest evaluation of 4. *Very well* was Skill No. 10 (Skill to get a grasp of situation). It accounted for 46.2%, and indicated the highest percentage among all 12 skills.

In any case, as an overall tendency, 3. *Moderately well* was the most common among all 12 skills, it accounted for 53.8% (Skill No. 10) to 84.6% (Skill No. 1 and Skill No. 7). On average, it showed 70.5%. The skills that were relatively prominent in the evaluation of 4. *Very well* were Skill No. 10: 46.2%, Skill No. 2: 38.5%, Skill No. 12 (Skill to stress control): 30.8%, and other skills were less than 30.0%. In the combined evaluation of 3. *Moderately well* and 4. *Very well* for each of the 12 skills, it accounted for 69.2% (Skill No. 4) or more, and showed 91.7% on average for all 12 skills. In addition to the fact that 1. *Not at all well* was not selected at all, it was a favorable result that many positive evaluations were seen for all 12 skills. In that sense, the degree of the individual skills that the 13 respondents could achieve or that could not achieve sufficiently were suggested through the practical training or practical work experience.

6.2 Features of the Answers in Part 2

All 11 skills except Skill No. 9 were selected for the skills that the students considered important in the workplace or business activities through practical work or practice education. Of the remaining 11 skills, the skills that showed a double-digit ratio were Skill No. 8 (20.5%), Skill No. 5 (17.9%), Skill No. 7 (10.3%), and Skill No. 10 (10.3%). Next, the skills that accounted for 7.7% were Skill No. 3, Skill No. 11, and Skill No. 12. The least skill was only Skill No. 2 (2.6%). In general, it was true that any skill was required. Looking at the three main skills, Skill No. 3 was the highest at 7.7% in *Action*, Skill No. 5 was the highest in *Thinking*, and Skill No. 8 was the highest in *Teamwork*. This suggested that Skill No. 3, Skill No. 5, and Skill No. 8 were emphasized for students. Within *Teamwork*, Skill No. 8, Skill No. 7, and Skill No. 10 demonstrated important skills. In any event, although students' answers were subjective ones regarding basic social skills for working adults, it was a result that showed which skills students placed importance on.

7. Conclusions and Suggestions

From the analysis of the results of this questionnaire survey, although there were a few respondents who gave a negative rating of 2. *Not very well* for the seven skills in Part 1, positive evaluations were significantly higher for all 12 skills. In Part 2, all skills were chosen except *Skill to respond flexibly* (Skill No. 9), especially, *Skill to listen to the opinions of others* (Skill No. 8) and *Skill to plan* (Skill No. 5) were relatively high. It was meaningful for students to self-diagnose or self-evaluate 12 skills after practical work or practice education, however, it was presumed that students dithered over the answers when making judgments regarding the four evaluation criteria or evaluation scales. Moreover, it was unclear whether the skills were acquired through practical work or practice education, therefore, it will be necessary to self-diagnose or self-evaluate related skills before practical work experience in the future. On that basis, it is also essential to be able to confirm the results of practical work experience through self-evaluation before and after practical work or practice education. At the same time, it is also important to compare a student's self-evaluation with an evaluation of student by on-the-job trainer from the perspective of human resources development or human resources education. In that sense, an accurate measurement of the results of practical work experience will determine student's success or failure of practical training in companies or cooperative education. Based on the results of this research, it is expected that further practical research will be continued on the acquisition of basic social skills for working adults including reviews of other previous research and related studies.

8. Acknowledgments

First and foremost, the researcher is grateful to the fourth-year students of JBC Department for their cooperation in this survey, and would also like to thank Ajarn Oscar Maruquez Malicad Jr., a full-time lecturer, Assistant to the Department Chair, English Business Communication, School of Liberal Arts, SPU for proofreading the English manuscript.

9. References

- Casio Computer Co., Ltd. (2021). *Keisan Online Calculator*. Retrieved September 18, 2021, from <https://keisan.casio.com/>
- Fujishima, Toshie and Kajita, Siziko. (2017). Effects and challenges of internship from a viewpoint of “Fundamental competencies for working persons”: The Case of junior college students. *Bulletin of Nakamura Gakuen University and Nakamura Gakuen University Junior College*, 49, pp. 149-158.
- International Students Support Network. (2010). *Basic ability checklist for working adults (Behavior change evaluation)*. Retrieved September 25, 2021, from https://issn.or.jp/pdf/checklist_02.pdf
- Japanese Chamber of Commerce [JCC], Bangkok. (n.d.). *Changes in the number of members*. Retrieved September 19, 2021, from <https://www.jcc.or.th/about/index3>
- Japan External Trade Organization [JETRO]. (2021a). *Business brief, foreign capital investment application amount will be halved in 2020, but Japan will be the leader*. Retrieved September 19, 2021, from <https://www.jetro.go.jp/biznews/2021/02/4da9dc84c9800206.html>
- _____. (2021b). *Business Brief, the number of Japanese companies in Thailand increased to 5,856, an increase of 412 from the previous survey*. Retrieved September 19, 2021, from <https://www.jetro.go.jp/biznews/2021/04/20d5c3d9315e11b9.html>
- Japan Foundation [JF]. (2018). *Japanese language educational institutions search*. Retrieved September 19, 2021, from <https://jpsurvey.net/jfsearch/>
- Kashima, H., Tsuji, B., Kambara, C., Sugiyama, S., Fujii, T., and Tanimoto, S. (2019). Practice and effect of project-based internship through an industry-university cooperative: From viewpoint of student’s social skill and fundamental competencies for working persons. *Bulletin of comprehensive education center, Prefectural University of Hiroshima*, 4, pp. 103-110.
- Matsuo, Tetsuya. (2015). The significance of internship and ‘Basic ability of working people.’ *Shimane journal of policy studies, University of Shimane*, 30, pp.49-63.
- Ministry of Economy, Trade and Industry. (2007). *Recommendation for fostering ‘basic skills for working adults’-Aiming to popularize the basic skills development program for working adults-*. Retrieved September 25, 2021, from http://www.op.titech.ac.jp/polymer/lab/sando/Policy_Proposal/Kisoryoku.pdf
- Ministry of Foreign Affairs of Japan. (2018). *Survey results on the number of Japanese residents Overseas and the number of Japanese companies operating overseas (2018 summary version)*. Retrieved September 19, 2021, from https://www.mofa.go.jp/mofaj/press/release/press4_006071.html
- Suwa, Yasuo. (2006). *Why is the basic ability of working people? Old and new indicators* (The Research Institute of Economy, Trade and Industry [RITEI]). Retrieved September 20, 2021, from <https://www.rieti.go.jp/jp/events/bbl/06040701.html>

- Suwa, Yasuo. (2011). *Series 4 Why was the concept of 'basic skills for working people' born? How should students, universities, and businesses change?* (HRPro [Human resource professional]). Retrieved October 8, 2021, from https://www.hrpro.co.jp/series_detail.php?t_no=69
- The Board of Investment of Thailand. (2021). *Foreign investment reports and statistics Years 2020 January - December*. Retrieved October 8, 2021, from https://www.boi.go.th/upload/content/Q4%202020_600a81a312120.pdf
- Wessa, Patrick. (2021). *Cronbach alpha - Free statistics software (Calculator), Office for research development and education*. Retrieved September 21, 2021, from https://www.wessa.net/rwasp_cronbach.wasp/
- Yokoyama, Shuichi. (2009). Career development and evaluation method for working adults: Career development and internship, Feature article on career coaching (Occupational guidance). *University and students*, October issue, pp.43-51.



Room 2

Business, Management

FACTORS AFFECTING FAST- AND SLOW-DELIVERY IN ECOMMERCE MARKET IN THAILAND

Dr.Worawat Joradon

Department of Logistics Management, Faculty of Business Administration,

Bangkok University, Thailand

Email: worawatj.j@bu.ac.th

ABSTRACT

Fast- and slow-delivery have an impact to the number of repeat customers; however, organizations also should balance the decreasing of logistics cost and the increasing of customer satisfaction to gain more competitive advantage for different situation. How to select a suitable delivery strategy for eCommerce market to maximize the service level and minimize delivery service cost is a noteworthy problem. Therefore, this paper investigates the factors that affecting fast- and slow-delivery in eCommerce market in Thailand and then propose a selection framework of four factors with fast- and slow-delivery options. Sample groups are generation Z in Thailand who shopping online platform. Then, the findings show that for fast-delivery, ease of use and on-time delivery are important factors; while for slow-delivery, the key factors are on-time delivery, suggestions for each user and special promotion. Thus, on-time delivery is a standard factor which affecting fast- and slow-delivery in eCommerce market in Thailand.

Keywords: Fast- and slow-delivery, eCommerce, Thailand

1. Introduction

Doing business in this era have become more increasingly challenging industrial marketing and sales teams to transform their traditional marketing strategies to real-time marketing. Technologies in the digital age as artificial intelligence (AI), big data analytics and cloud computing have created unprecedented opportunities for organizations to do business widely, both online and offline market. From eCommerce activities, it consists of the transactions of the business flow, information flow, capital flow and logistics. Thus, various organizations are entering in eCommerce market with numerous forms. The emergence of eCommerce has provided the convenience for the buyers and also increased online transactions for business. According to eCommerce enterprise, logistics activity has become an important party of its competitiveness, the options of logistics distribution mode directly affects the product's quality, costs of distribution and customer satisfaction. There are three mains distribution options for eCommerce enterprises as self-built logistics, third-party logistics and the joint (hybrid) distribution mode (Zheng, Zhang, & Song, 2020). Furthermore, organizations need to understand

customer requirement for distribution options to increase customer satisfaction by reviewing advantages and disadvantages for each options.

Moreover, the COVID-19 pandemic in Thailand has accelerated change the buyer behaviour of Thai people for shopping online than before. Buyers cannot shopping like a normal time, so they shift shopping from physical market to online market for buying various necessities from home by using the online shopping application. In addition, the government policy relates to social distancing and stay at home campaign motivates people to use online platforms over and over again. On the other hand, the increasing on demand from customers has caused some difficulties for the logistics organizations to distribute their products and goods which relate to late delivery and complicated orders. Zoroja, Klopota, and Ana-Marija (2020) found that Asian eCommerce market generates 831,7 billion USD higher than North American eCommerce and European eCommerce who generates 552,6 billion USD and 346,5 billion USD respectively. Moreover, many organizations invested more resources as financial, human and technological in adapting eCommerce feature for their business so organizations need to maintain the quality of eCommerce practices for successful performance in the eCommerce market (Sharma & Gupta, 2003). Then, when organizations have various distribution options, it comes with higher cost and prices. Thus, this study will present factors to organizations with two different options as 1) fast delivery with higher cost and 2) slow delivery with lower cost. Thus, this is an opportunity to study that which option is the best choice for organizations who attending eCommerce market.

2. Objectives

The objectives of this study are 1) to study the factors affecting high cost with fast delivery and 2) to study the factors affecting low cost with slow delivery.

3. Literature Review

E-Commerce has been used for a long time and also was studied by the researchers for many years. According to Bjerkan, Bjørgen, and Hjelkrem (2020), the phenomenon of eCommerce is the best indicator that points out how our lives are transforming digitally, including changes on personal, organizational, and global levels. Moreover Xianglian and Hua (2013) explain that eCommerce consists of online information delivery + online trading + online billing + logistics distribution. So eCommerce combines different departments to work together. In addition, Zoroja et al. (2020) found in some European countries, the usage and quality of web sales and eCommerce practices exists. Moreover, Zoroja et al. (2020) explain that leaders countries in Europe, such as the United Kingdom, Germany, Finland, Denmark and Belgium, utilize more B2C eCommerce than other European countries. Thus, organizations should focus on eCommerce practices usage to support their customers. Moreover, Febransyah and Goni (2020) found four main criteria for measuring the supply chain competitiveness as cost, differentiation, sustainability and infrastructure which consists of software and hardware infrastructure. In addition, Olagunju, Oyebode, and Orji (2020) found 9 key positive issues from merchants in Africa as quick for selling items, ease of use, discounts, fast delivery, affordable products, user friendliness, convenience, cash-

on-delivery (COD) and good aesthetics; while there are 9-negative issues such as bad customer service, high shipping fee, poor packaging, sudden cancellation of order without notice, delivery mistakes, purchased item tracking issues, fake sellers and poor quality. Furthermore, many previous studies present that customers consider the logistics performance as an important factor of eCommerce, especially the last-mile distribution (Yu, Wang, Zhong, & Huang, 2017).

Regarding to the literature, there are various factors related to eCommerce business; however, in this study, it will focus on four factors as ease of use, on-time delivery, suggestions for each user and special promotion because these factors are foundation concept for eCommerce business. Then, based on research objectives and research questions for this study. Hypotheses testing were developed as followed:

RQ1: which factors are affecting high cost with fast delivery

H0: Ease of use, on-time delivery, suggestions for each users and special promotion have not the relationship to high cost with fast delivery

H1: Ease of use, on-time delivery, suggestions for each users and special promotion have the relationship to high cost with fast delivery

RQ2: which factors are affecting low cost with slow delivery

H0: Ease of use, on-time delivery, suggestions for each users and special promotion have not the relationship to low cost with slow delivery

H1: Ease of use, on-time delivery, suggestions for each users and special promotion have the relationship to low cost with slow delivery

Figure 1 presents study framework of this research.

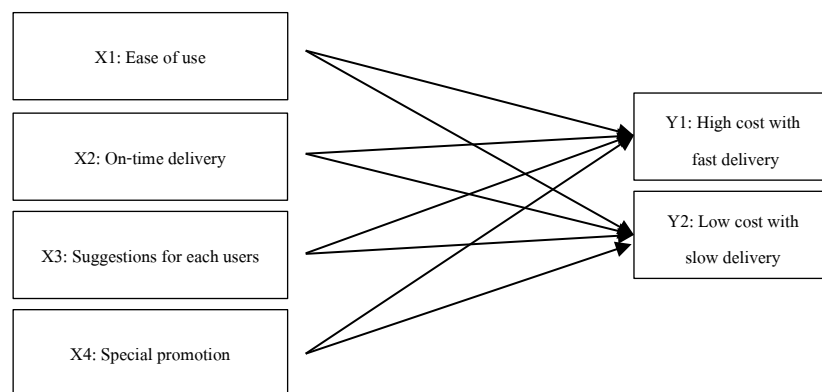


Figure 1: Study Framework

4. Research Methodology

The main objective of this study is to explore and understand the factors that related to fast or slow delivery on eCommerce market in Thailand. Hence, this study employed a quantitative method for collecting and interpreting data. The population frame of this study consists of online purchasers. Regarding to the research

model and hypotheses were developed based on the critical review of prior theories and studies. These hypotheses were then tested by collecting data from online customers by using survey method. The questionnaire was designed on Thai language and convenience sampling is used in this study. A total of 30 appropriate respondents were invited to voluntarily participate in a pilot test to ensure the wording and meaning of the items of measure. In 2021, a formal survey was conducted through Google Forms in Thailand between 18th – 30th April 2021. Online survey is widely used at this moment due to COVID-19 pandemic so the researcher needs to collect data safe. Thus, online survey was the appropriate method to collect data for this study.

A total of 250 respondents online survey were randomly invited to do the survey. After two weeks, a total of 104 respondents were answered the questionnaire via online survey. However, after review the data, 4 responses were removed due to inaccurate data. So a total of 100 data were used in this study. Hence, the response rate was 40%. The minimum requirement for a sample is one variable to ten respondents with related to 10 times rule (Barclay, Higgins, & Thompson, 1995; Hair, Hult, Ringle, & Sarstedt, 2016), thus a respondent size of 100 is considered sufficient because it has six variables for this study. The questionnaire is divided into two sections with a total of 11 items. For the main points, the questions were designed using a 5-point Likert Scale from Strongly Disagree (1) to Strongly Agree (5) to measure the relationship between customer perspective with fast- and slow delivery. Moreover, the Cronbach's alpha for these variables are 0.631 which is a general accepted rule to indicate an acceptable level of reliability (Hulin, Netemeyer, & Cudeck, 2001).

For data analyses, personal information was analyzed by frequency and percentage. While the opinions about ease of use, on-time delivery, suggestions for each users and special promotion, high cost with fast delivery and low cost with slow delivery, were analyzed with mean and standard deviation. Then, multiple linear regression was used to analyze the relationship between independents and dependent variables.

5. Research Findings

Regarding to usable data, the findings show that about half and a half between male (48%) and female (52%). Most of the respondents have age between 21 to 30 years old (64%), then 31 to 40 years old (19%), 41 to 50 years old (14%) and lower than 20 years old (3%), respectively. More than a half are students and undergraduate students (61%) and follow with company employee (24%), government employee, owner and freelance. Salary from these respondents are between 10,001 to 20,000 baht (45%), and lower than 10,000 baht (30%). 82% of respondents are single with 16% are married and just only 2% are divorce. Therefore, the results from this study come from generation Z who are using eCommerce platform as daily life.

Accordingly, all variables are presented in Table 1 for independent variables by using five rating scales, the highest score from respondents is Special Promotion with mean = 4.51 and SD = 0.674, then ease of use with mean = 4.49 and SD = 0.689. The followings are suggestions for each user with mean = 4.30 and SD = 0.798 and on-time delivery with mean = 3.35 and SD = 1.250. While, dependent variables, high cost with fast delivery has high score than low cost with slow delivery. Thus, the research results showed that most of answer from respondents are strongly agree with these independent variables.

Table 1: Descriptive Statistic for interval scale

Factors	N	Min	Max	Mean	SD	Meaning
X1: Ease of use	100	2	5	4.49	0.689	Strongly Agree
X2: On-time delivery	100	1	5	3.35	1.250	Natural
X3: Suggestions for each user	100	2	5	4.30	0.798	Strongly Agree
X4: Special Promotion	100	2	5	4.51	0.674	Strongly Agree
Y1: High cost with fast delivery	100	1	5	4.07	0.868	Strongly Agree
Y2: Low cost with slow delivery	100	1	5	3.62	1.144	Agree
Cronbach's Alpha = 0.631						

Regarding to multiple linear regression result in Table 2, there are the relationship between ease of use (X1), on-time delivery (X2), suggestions for each user (X3), special promotion (X4) and high cost with fast delivery (Y1) but with low relationship as R value = 0.477. Furthermore, it can be explained that these independent variables contribute to high cost with fast delivery about 19.5% and the less come from other variables. The analysis result was statistically significant, by the standards of the study when p (or sig. value) < 0.05. Based on the result in Table 2 in ANOVA value (0.000), it showed the relationship between independent variables and dependent variable with $p < 0.05$. In addition, in Table 2, when the analysis of each independent variable is analyzed, it showed there are two variables only that have statistically significant as ease of use (X1 with p-value = 0.001) and on-time delivery (X2 with p-value = 0.003), which have an impact to high cost with fast delivery (Y1). Then, the formulation for this equation is “High cost with fast delivery (Y1) = 1.273 + 0.460(Ease of use: X1) + 0.193(On-time delivery: X2)”. So, it can be concluded the researcher rejected H0 and accepted H1 for RQ1 as “Ease of use, and on-time delivery have the relationship to fast delivery with high cost”.

Table 2: Multiple linear regression for high cost with fast delivery

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.273	.649		1.961	.053
X1: Ease of use	.460	.134	.365	3.422	.001
X2: On-time delivery	.193	.063	.278	3.083	.003
X3: Suggestion for each user	.076	.118	.070	.641	.523
X4: Special Promotion	-.053	.139	-.041	-.384	.702

a. Dependent Variable: High cost with fast delivery

$r = 0.447$; $r^2 = 0.228$, $r^2 \text{ adj} = 0.195$, ANOVA sig = 0.000

On the other hand, Table 3 demonstrated the relationship between ease of use (X1), on-time delivery (X2), suggestions for each user (X3), special promotion (X4) and low cost with slow delivery (Y2) with moderate

relationship as R value = 0.609. Moreover, it can be explained that these independent variables contribute to low cost with slow delivery about 34.4% and the less come from other variables. As similar to previous discussion, these independent variables have the relationship to dependent variable as showed in Table 3 with ANOVA value (0.000) as p -value less than 0.05. Then, in Table 3, it can be found that there are three independent variables have the relationship with dependent variable based on statistically significant (p -value < 0.05). On-time delivery (X2 with p -value = 0.000), suggestion for each user (X3 with p -value = 0.009) and special promotion (X4 with p -value = 0.018) have the relationship with low cost with slow delivery (Y2). Then, the regression equation for this study is “Low cost with slow delivery (Y2) = 1.312 + 0.484(On-time delivery: X2) + 0.373(Suggestion for each user: X3) – 0.396(Special Promotion: X4)”. Thus, the findings can lead to reject H_0 and accept H_1 for RQ_2 as “On-time delivery, suggestions for each users and special promotion have the relationship to slow delivery with low cost”.

Table 3: Multiple linear regression for low cost with slow delivery

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.312	.773		1.698	.093
X1: Ease of use	.194	.160	.117	1.210	.229
X2: On-time delivery	.484	.075	.529	6.493	.000
X3: Suggestion for each user	.373	.140	.260	2.656	.009
X4: Special Promotion	-.396	.165	-.234	-2.398	.018

a. Dependent Variable: Low cost with slow delivery

$r = 0.609$; $r^2 = 0.371$, r^2 adj = 0.344, ANOVA sig = 0.000

6. Conclusion

According to the current situation for doing business in COVID-19 pandemic, it can be found that eCommerce market is a good place to promote and selling product to customers. It is not surprising that delivery process is the most important sector for this situation. Then, the findings suggest different factors for two different delivery strategy. Firstly, if the organizations wish to do fast delivery, they need to focus on ease of use for eCommerce and on-time delivery to their customer; while if the organizations focus on slow delivery, they need to look for on-time delivery, suggestions for each user and special promotion which related to customer's experience and customer expectation. Figure 2 summarizes the final framework of this study.

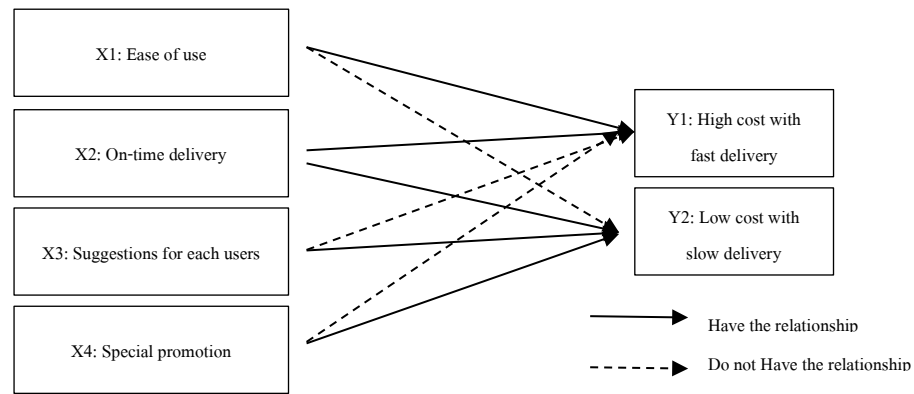


Figure 2: Summary Study Framework

Furthermore, when compare the average between high cost with fast delivery and low cost with slow delivery, it showed that most of respondents prefer with fast delivery with high cost. This result might be related to the age of respondents because most of them are generation Z who cannot wait something for a long time. Thus, the organizations who focus the customers from generation Z should focus on fast delivery to support customer satisfaction. According to the findings, it can be seen that on-time delivery is an only one factor that has statistically significant for both delivery strategy, thus organizations need to guarantee that they can deliver products at the time they promise even though fast- or slow-delivery. Therefore, the organizations who are attend to eCommerce market should focus on on-time delivery first and then enhance other factors respectively. So this study support Zheng et al. (2020) that logistics ability has become an important factor for competitive advantage in eCommerce market.

Moreover, different size of organization, as small and medium enterprise or large companies, might have different cost between fast- and slow-delivery. So organizations need to know their products positioning and their customer expectations. Customers will pay more money for their product if they want it right now and play less money for products that they can wait. It indicates that an increase in the money for delivery strategy refers to the level of customer expectation so organizations should aware for this situation. Therefore, organizations need to balance between sale and marketing department who are front line as contact point with customers and logistics and supply chain department who are back line as support activities for delivering customer orders. This findings support the study from Yu et al. (2017) that the logistics service is directly provided to the final customer who always has high expectation. Moreover, if organizations plan promotion period by preparing delivery strategy in advance, it might support organization to gain more competitive advantage as same as studied from Yu et al. (2017) that the logistics models and supporting techniques improve the eCommerce logistics significantly. Furthermore, the findings support Zoroja et al. (2020), that the usage of eCommerce has a positive impact on business. So organizations might focus on ease of use along with on-time delivery when they enhance delivery strategy together.

7. Suggestion

For future study, it might focus on reverse logistics from eCommerce which relates to return product acquisition, product disassembly, remanufacturing and remarketing because when eCommerce market grows quickly, it will increase return process as well. This will support closed-loop supply chain for eCommerce market. Moreover, future study might focus more factors that relate to customers' expectation or customer satisfaction for developing better delivery options because different situations should apply different delivery strategy. There is no one fit all situation anymore. In addition, future study should investigate in terms of financial or cost for these delivery options to compare and select better option for each market sector. Finally, future research might collect more respondents with different generation to increase more reliability and accuracy in the future.

8. References

- Barclay, D., Higgins, C., & Thompson, R. (1995). *The partial least squares (PLS) approach to casual modeling: personal computer adoption and use as an illustration*.
- Bjerkkan, K. Y., Bjørgen, A., & Hjelkrem, O. A. (2020). E-commerce and prevalence of last mile practices. *Transportation Research Procedia*, 46, 293-300.
- Febransyah, A., & Goni, J. I. C. (2020). Measuring the supply chain competitiveness of e-commerce industry in Indonesia. *Competitiveness Review: An International Business Journal*.
- Hair, J. F., Jr., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. London: Sage Publications.
- Hulin, C., Netemeyer, R., & Cudeck, R. (2001). Can a reliability coefficient be too high? *Journal of Consumer Psychology*, 55-58.
- Olagunju, T., Oyeboode, O., & Orji, R. (2020). Exploring key issues affecting African mobile ecommerce applications using sentiment and thematic analysis. *IEEE Access*, 8, 114475-114486.
- Sharma, S. K., & Gupta, J. N. D. (2003). Socio-economic influences of e-commerce adoption. *Journal of Global Information Technology Management*, 6(3), 3-21.
- Xianglian, C., & Hua, L. (2013). Research on e-commerce logistics system informationization in chain. *Procedia-social and behavioral sciences*, 96, 838-843.
- Yu, Y., Wang, X., Zhong, R. Y., & Huang, G. Q. (2017). E-commerce logistics in supply chain management: Implementations and future perspective in furniture industry. *Industrial Management & Data Systems*.
- Zheng, K., Zhang, Z., & Song, B. (2020). E-commerce logistics distribution mode in big-data context: A case analysis of JD. COM. *Industrial Marketing Management*, 86, 154-162.
- Zoroja, J., Klopota, I., & Ana-Marija, S. (2020). Quality of e-commerce practices in European enterprises: cluster analysis approach. *Interdisciplinary Description of Complex Systems: INDECS*, 18(2-B), 312-326.

SERVICE MARKETING MIX AFFECTING CUSTOMER DECISION MAKING OF DOMESTIC PRIVATE EXPRESS COURIER SERVICE

Assistant Professor Dr. Ravipa Akrajindanon

Dean, School of Business, Sripatum University

Email: ravipa.ak@spu.ac.th

Assistant Professor Dr. Anupong Avirutha

Director, Sripatum Business Innovation Creativity and Incubation Center, and

Head of Digital Business Management Department

School of Business, Sripatum University

Email: anupong.av@spu.ac.th

ABSTRACT

This study attempts to study the relationship between service marketing mix and customer decision making of domestic express courier service. This study employed convenience sampling to collect data. A total of 400 usable samplings of e-marketplace customers are obtained. The findings reveal that the predictor variables of service ($\beta = 0.356$, $t = 6.341$, $P = 0.000$), and place ($\beta = 0.363$, $t = 4.872$, $P = 0.000$), people ($\beta = 0.168$, $t = 3.187$, $P = 0.002$), and process ($\beta = 0.151$, $t = 3.317$, $P = 0.001$) are achieved significance.

Keywords: Service Marketing Mix, Domestic Private Express Courier Service, Customer Decision Making

Introduction

According to Frost & Sullivan, a research & consulting firm, e-commerce in Thailand is projected to grow by 26.7% from 2019-2024. The growth in e-commerce would boost the demand of using parcel delivery services, directly benefitting domestic express delivery service. The total market size of parcel delivery services is still in a growth stage, and the market is getting bigger every year thanks to improvements in parcel delivery services, e-commerce platforms, attractive pricing, and new technologies. In 2019, the total parcel delivery service market size was over THB50b vs THB34b in 2017. We believe that it grew even larger in 2020, as Covid-19 should have accelerated the adoption rate of using e-commerce services during the period when most people stayed home. The parcel delivery service market size is huge, it also draws attention from newcomers to enter into the market and take a piece from the table. In 2019, four more parcel delivery companies entered the market: Flash Express, J&T Express, Ninja Van, and Best Express. All of these new competitors contributed around 7% of the market share in 2019, and we expect that they gained a lot more in 2020. Therefore, the research objectives are to examine the factors affecting customer decision making of domestic express parcel delivery services.

Domestic Private Express Courier Service

Domestic private express courier service is excellently positioned to capture the growing use of e-commerce in Thailand as consumer behavior changes to favor ordering online. Growth potential is huge as e-commerce penetration in Thailand is low at 3.7% in 2019 vs 26.7% in South Korea and 9.0% in Japan according to Frost & Sullivan (2020). The e-commerce market started showing solid growth in the Thai market less than four years ago. Right now, e-commerce accounts for only 3% compared to the retail market's THB2.6t-3t, according to Frost & Sullivan (2021), they forecasted that e-commerce to grow significantly by 26.7% from 2019-2024. The strong growth in the express parcel delivery service industry in Thailand over the past few years due to rising e-commerce in Thailand has led many other players to enter the market, both domestic and international and thus some pricing competition. The size of the market is large enough for all players to grow, as e-commerce penetration in Thailand is still low at only 3.7% (SCBS, 2021). There have been a lot of improvements in parcel delivery services in Thailand in recent years, such as 1) door-to-door pick-up and last-mile services; 2) same-day deliveries; and 3) cash on delivery and other services that can facilitate customers. However, the most important development in parcel deliveries has been a price war. The major players in this industry are Kerry, Ninja Van, Flash Express, J&T Express, DHL, TNT, and Best Express. Kerry Express is the largest in terms of revenue, Thai private express delivery company as at 2019. It is amongst the most profitable and it has amongst the highest return ratios relative to peers. Kerry Express is amongst the few companies that has achieved profitability consistently and substantially, given its strong position and entry barriers, as an established player in the Thai private express delivery market Frost & Sullivan (2020).

Service Marketing Mix

Marketing mix is the most basic framework that underlined in the strategic marketing process of organizations. Kotler (2005) states that the 4Ps model still provides a valuable framework for marketing planning. The main point beside selling and generating the revenue is that specific elements contained in the marketing mix should deliver more value, build a long-term and mutually profitability relationship with customers. McCarthy (1971) introduced the number of elements in the marketing mix to four basic ones and defines marketing mix as mix of four marketing variables (4Ps), namely, product, price, place, and promotion.

However, Generally, the adoption of marketing activities can be varied depending on the extent and characteristic of particular service business. Express parcel delivery is entirely perceived as service business. Zeithaml and Bitner (2004) suggested a modification of the mix elements by adding three more factors to the original 4Ps: people, physical evidence and process. Kotler (2005) explained that product considers both tangible (goods) and intangible (services) products which include services quality, service facilities, branding, packaging, standardization and grading. Price decisions affect both a firm's sales and profits, so price is always a consideration. Price is defined as any transaction in our modern economy can be thought of as an exchange of money-the money being the price-for something. The function of place is to match supply capabilities to the demands of the many target markets, moving goods wherever they are needed, including the factors that go into

providing the time, and place, and possession utilities needed to satisfy target customers. Promotion considers that is communication between seller and buyer, including advertising, personal selling, sales promotion, tools of publicity, public relations, and various other forms of promotion. Promotion is vital, but not the only element of marketing strategy. People is one of the elements of service marketing mix. A well-chosen staff and target group can develop a good pattern of interaction between customers and service providers. Process is a particular activity of operations or sequence of actions which the organization uses when delivering the service. Poorly designed processes are likely to irritate customers when they experience slow, bureaucratic, and ineffective service delivery. Lastly, Physical evidence is a way to present the aspects of place and product that are particular to service purchases. It refers to all the physical elements that a customer of a service might come across.

Customer Decision Making

Customers start searching information before making a decision to purchase product or service. Customers have evolved and no longer make purchasing decisions in a linear approach; they enter at various points, which are dependent on their first engagement with the brand, product research or word of mouth from their online society (Powers et al., 2012). The five-stage consumer decision making process was first introduced in 1910 by John Dewey (Bruner & Pomazal, 1988), and include: problem recognition, information search, evaluation of alternatives, purchase decision and post purchase behavior. Problem recognition is the situation when the consumers recognize their problems and what products to buy to solve these problems. When consumers are not satisfied with the product they have bought or the stored product has been used up or expired, the consumers will search for more information on the products, they will need to buy in the future. This condition complies with Kotler and Keller's (2009) and Hawkins and Mothersbaugh's (2013) found that recognition of problems of the consumer brings about their search for information on the product to be purchased. Recently, many consumers refer the product or service evaluations in reputation information (Cui, Lui , and Guo, 2012).

Research Methodology

The research design is drawn from quantitative research methodology. The survey is used to establish a baseline on the relationship between service marketing mix and customer decision making of domestic private express courier service. This study employed convenience sampling to collect data. The total sample for this study consists of 400 samplings. The participants in this study are voluntary and anonymity. The survey is expected to be responded by the one who has the experience with the service. To collect the data, two methods are used: (a) personal contact, and (b) self-administered survey. Descriptive, frequency, percentage distributions, means are used to describe and report the information collected affecting to individual variables and demographic information. Furthermore, the data obtained is analyzed by Stepwise Multiple Regression.

Results

A total of 400 usable questionnaires are obtained. The results show the distribution of usable responses by gender; consist of 133 males (33.25%), and 267 females (66.67%). The respondent response by age; 75 (18.75%) respondents report their age to be between 18 and 32; 84 (21%) respondents report their age to be between 33 and 40; 85 (21.25%) respondents report their age to be between 41 and 50; 85 (21.25%) respondents report their age to be between 51 and 60; and 71 (17.75%) respondents reports his/her age to be over 61.

The results show the distribution of usable responses by the frequency use the delivery service per week; 83 (20.75%) report that they use the delivery service once a week; 104 (26%) report that they use the delivery service 1 – 3 times a week; 112 (28%) report that they use the delivery service 4 – 6 times a week; and 101 (25.25%) report that they use the delivery service over 6 times a week.

The result also presents the frequency of the major domestic express courier services that respondents use. The respondents report that they frequency use the delivery service from Kerry (212: 53%); followed by Flash Express (126: 31.5%), Best Express (24: 6%), J&T Express (24: 6%), and Ninja Van (14: 3.5%).

Table 1 shows the respondents are asked their opinion regarding service factor in service marketing mix element that they have experienced of using domestic private express courier service. The most frequency endorsed responses is scheduled delivery is available (mean = 4.21), followed by on-demand delivery is available (mean = 4.16), same-day and next-day delivery are available (mean = 4.09), and locker boxes service is available (mean = 4.00).

Table 1 The Mean for Service Factor in Service Marketing Mix Element

Service	Mean	SD.	Ranking
Scheduled delivery is available	4.21	0.78	1
On-demand delivery is available	4.16	0.84	2
Same-day and next-day delivery are available	4.09	0.77	3
Locker boxes service is available	4.00	0.75	4
Average	4.12	0.65	

Table 2 shows the respondents are asked their opinion regarding price factor in service marketing mix element that they have experienced of using domestic private express courier service. The most frequency endorsed responses is Service charge and fee (mean = 4.00), followed by the service value for money (mean = 3.94), cash on delivery is available (mean = 3.93), and varieties of payment methods are available (mean = 3.91).

Table 2 The Mean for Price Factor in Marketing Mix Element

Price	Mean	SD.	Ranking
Service charge and fee	4.00	0.86	1
The service value for money	3.94	0.84	2
Cash on delivery is available	3.93	0.87	3
Varieties of payment methods are available	3.91	0.77	4
Average	3.95	0.78	

Table 3 shows the respondents are asked their opinion regarding place factor in service marketing mix element that they have experienced of using domestic private express courier service. The most frequency endorsed responses is delivery area coverage (mean = 4.27), followed by pick-up / drop-off locations (mean = 4.24), providing the tracking system to track the order status (mean = 4.16), and application is easy to access and navigate (mean = 4.11).

Table 3 The Mean for Place Factor in Service Marketing Mix Element

Place	Mean	SD.	Ranking
Delivery area coverage	4.27	0.78	1
Pick-up / drop-off locations	4.24	0.87	2
Providing the tracking system to track the order status	4.16	0.76	3
Application is easy to access and navigate	4.11	0.86	4
Average	4.20	0.69	

Table 4 shows the respondents are asked their opinion regarding promotion factor in service marketing mix element that they have experienced of using domestic private express courier service. The most frequency endorsed responses is coupon code for extra discount (mean = 3.69), followed by flash deal for special promotion and events (mean = 3.67), extra insurance coverage (mean = 3.50), and having rewards points programs (mean = 3.50).

Table 4 The Mean for Promotion Factor in Service Marketing Mix Element

Promotion	Mean	SD.	Ranking
Coupon code for extra discount	3.69	1.00	1
Flash deal for special promotion and events	3.67	1.06	2
Extra insurance coverage	3.50	1.11	3
Having rewards points programs	3.50	1.10	4
Average	3.59	0.76	

Table 5 shows the respondents are asked their opinion regarding people factor in service marketing mix element that they have experienced of using domestic private express courier service. The most frequency endorsed responses is good advice and reliable from the staffs (mean = 4.27), followed by staffs can solve the problem very well (mean = 4.15), enough staffs to cover all service (mean = 4.07), and staffs are polite and neat (mean = 3.98).

Table 5 The Mean for People Factor in Service Marketing Mix Element

People	Mean	SD.	Ranking
Good advice and reliable from the staffs	4.27	0.75	1
Staffs can solve the problem very well	4.15	0.77	2
Enough staffs to cover all service	4.07	0.79	3
Staffs are polite and neat	3.98	0.88	4
Average	4.12	0.65	

Table 6 shows the respondents are asked their opinion regarding process factor in service marketing mix element that they have experienced of using domestic private express courier service. The most frequency endorsed responses is offering speed operation of service (mean = 4.16), followed by the operating hours at convenience time (mean = 4.11), the service offering process meets the standard (mean = 4.09), and schedule pick-up is on time (mean = 4.06).

Table 6 The Mean for Process Factor in Service Marketing Mix Element

Process	Mean	SD.	Ranking
Offering speed operation of service	4.16	0.84	1
The operating hours at convenience time	4.11	0.80	2
The service offering process meets the standard	4.09	0.81	3
Schedule pick-up is on time	4.06	0.86	4
Average	4.10	0.70	

Table 7 shows the respondents are asked their opinion regarding physical evidence factor in service marketing mix element that they have experienced of using domestic private express courier service. The most frequency endorsed responses is packaging supplies (boxes, bubble, tapes, etc.) are available (mean = 4.34), followed by center has spacious parking space (mean = 4.22), technology instruments operation available (mean = 3.69), and having adequate area of waiting zone (mean = 3.67).

Table 7 The Mean for Physical Evidence Factor in Service Marketing Mix Element

Physical Evidence	Mean	SD.	Ranking
Packaging supplies (boxes, bubble, tapes, etc.) are available	4.34	0.74	1
The center has spacious parking space	4.22	0.81	2
Technology instruments operation available	3.69	0.80	3
Having adequate area of waiting zone	3.67	0.81	4
Average	3.98	0.75	

Table 8 shows the respondents are asked their opinion regarding the customer decision making of domestic private express courier service. The most frequency endorsed responses is I am satisfied the service from this company (mean = 4.16), followed by I prefer using the service from this company (mean = 4.11), I enjoy order food on digital application platform (mean = 4.09), and I consider this company as my first choice (mean = 4.05).

Table 8 The Mean for Customer Decision Making of Domestic Private Express Courier Service

Customer Decision Making	Mean	SD.	Ranking
I am satisfied the service from this company	4.16	0.84	1
I prefer using the service from this company	4.11	0.80	2
I enjoy order food on digital application platform	4.09	0.81	3
I consider this company as my first choice	4.05	0.86	4
Average	4.10	0.81	

Table 9 shows the significance of each coefficient for each independent variable. It reveals that the predictor variables of service ($\beta = 0.356$, $t = 6.341$, $P = 0.000$), and place ($\beta = 0.363$, $t = 4.872$, $P = 0.000$) are achieved significance at the 0.01 level, while people ($\beta = 0.168$, $t = 3.187$, $P = 0.002$), and process ($\beta = 0.151$, $t = 3.317$, $P = 0.001$) are achieved significance at the 0.05 level. Therefore, the regression equation for predicting the dependent variable from the independent variable is

$$\text{Customer Decision Making} = 1.546 + 0.381(\text{Service}) + 0.416(\text{Place}) + 0.174(\text{People}) + 0.190(\text{Process})$$

Table 9 The Relationship between Service Marketing Mix and Customer Decision Making

The Relationship between Service Marketing Mix and Customer Decision Making	Regression Coefficient (b)	Standardized Coefficient (β)	t	P
Service	0.381	0.356	6.341	0.000**
Price	0.046	0.032	0.732	0.451
Place	0.416	0.363	4.872	0.000**
Promotion	0.112	0.097	1.975	0.058
People	0.174	0.168	3.187	0.002*
Process	0.190	0.151	3.317	0.001*
Physical Evidence	0.064	0.048	0.646	0.519
Constant (a)	1.546		7.866	0.000*
R = 0.503, R² = 0.253, SEE = 0.73970, F = 47.035, P = 0.000*				

*P < 0.05, **P < 0.01

Conclusion and Implication

Decisions cannot be made on one element of the marketing mix without considering its impact on other factors (Low and Kok, 1997). Additionally, Yulisetiarini, Subagio, Paramu, and Irawan (2017) found that service quality is a crucial factor that interpreted the customers' effort to fulfill the needs and wants. The result of service marketing mix has influenced to consumers decision to use parcel delivery services. From the analysis, there were four factors of the service marketing mix (service, place, people, and process) were significant to customer decision making, while three components (price, promotion, and physical evidence) were not.

The study indicated that place is the most significant influence on customer decision making to use parcel delivery services, that it is accessible locations should be given priority by centers. Customers generally can pick the parcels up, and/ or drop-off only from center (service point location). Therefore, the couriers may consider to have subcontractors, so that All consumer shipments will be handed over to a subcontractor, if the first delivery attempt fails. The subcontractor will distribute the parcels to pick-up locations that are situated close to the consumers' homes.

The second most significant influent on customer decision making to use parcel delivery service is that service element of the service marketing mix. the improvement of service quality is particularly important in the context of designing a sustainable value proposition, since the customers reports that they prefer on-time (scheduled delivery, on-demand, same-day and next-day delivery) delivery of services should be ensured to guarantee decision making, the couriers should provide the customers for their most convenience. Moreover, when customers have a better perception of service quality, they are more likely to trust the service. To increase customer trust, a service provider should make an effort to reduce perceived uncertainties, fluctuations, and risk during the service provision.

Customers make the purchasing decision based on their convenience in term on locations, time, and process. A poorly designed process can lead to a slow, useless, and low-quality service delivery resulting in customers' frustration. Offering speed operation of service has been determined as the most important criterion. Some cases, the company needs to deal with problems that prevent usual operating systems from completing successfully and instances where customers are unhappy with the process/ service received. Furthermore, increasing the efficiency of the process, the company may consider to integrate the online system that processes for facilitating customer-end delivery service.

One of the most important aspects of a courier and local delivery company is the company's employees. A company's employees are vital to its operational success. Lacking employees will cause the performance and value of the business to suffer. Employees are adequately trained on communicating with customers, any miscommunication may frustrate all marketing efforts. Moreover, employees need to be able to inspire trust and confidence towards the customers.

Lastly, to improve more comprehensive result, the researcher would recommend several things. In this study focused only on the service marketing variables. The further researearh may add some other perspective such as repurchasing, brand loyalty, customer experices, and abandon factors. Moreover, I nvestigation in various geographical areas to see how differences of each areas. Future research should seek to use multiple approaches in their research, such as combinations of interviews, observation, focus groups, document analysis and questionnaires.

References

- Bruner, G. C., & Pomazal, R. J. (1988). Problem Recognition: The Crucial First Stage of the Consumer Decision Process. *Journal of Consumer Marketing*, 5(1), 53-63.
- Cui G, Lui HK, Guo X. (2012). The Effect of Online Consumer Reviews on New Product Sales. *International Journal of Electronic Commerce*, 17 (1), 39-58.
- Frost and Sullivan (2020). *Independent Market Research Report on the Private Express Delivery Industry in Thailand (with Global Overview) and Overview of the E-Commerce Marketing in Thailand (2020)*. Retrieved May 30, 2021. <https://market.sec.or.th/public/ipos/IPOSGetFile.aspx?TransID=305545>
- _____. (2021). *Independent Market Research Report on the Private Express Delivery Industry in Thailand (with Global Overview) and Overview of the E-Commerce Marketing in Thailand (2021)*. Retrieved May 30, 2021. <https://market.sec.or.th/public/ipos/IPOSGetFile.aspx?TransID=305545&TransFileSeq=52>.
- Hawkins, D. I., & Mothersbaugh, D. L. (2013). *Consumer Behavior Building Marketing Strategy* (12th ed.). New York, NY: McGraw-Hill.
- Kotler, P. (2005). *According to Kotler: The World's Foremost Authority on Marketing Answers the World's Foremost Authority on Marketing Answers Your Questions*. New York: AMACOM.

- Kotler, P., & Keller, K. L. (2009). *Marketing Management* (13th ed.). Upper Saddle River, NJ: Pearson/Prentice Hall.
- Low, S. P. and Kok, H. M. (1997) Formulating a strategic Marketing Mix for Quantity Surveyors. *Marketing Intelligence and Planning*, 15(6), pp.273-280.
- McCarthy, E. J. (1971). *Basic Marketing: A Managerial Approach* (4 ed.). Homewood, 111., R.D. Irwin.
- Powers, T., Advincula, D., Austin, M. S., Graiko, S., & Snyder, J. (2012). Digital and Social Media in the Purchase Decision Process. *Journal of Advertising Research*, 52(4), 479-489.
- SCBS. (2021). *Kerry Express (Thailand) KEX - SCBS Research*. Retrieved May 30, 2021 https://res.scbsonline.com/stocks/extra/45323_20210426085801.pdf
- Yulisetiari, D., Subagio, A., Paramu, H., & Irawan, B. (2017). "Customer Repurchase Intention and Satisfaction in Online Shopping." *International Business Management*. 11 (1), 215-221.
- Zeithaml, V. A., & Bitner, J. (2004). *Services marketing: Integrating customer focus across the firm* (3rd ed.). New York, NY: McGraw Hill.

SOME SOCIAL ENTREPRENEURS REINVEST ALL PROFITS TOWARDS THEIR PURPOSE AND OTHERS DON'T – A SOUTHEAST ASIAN PERSPECTIVE

Ulrike Guelich

Bangkok University School of Entrepreneurship and Management

E-mail: ulrike.guelich@gmail.com

ABSTRACT

The role of social innovation for entrepreneurs, imagining and pursuing a more inclusive ‘better’ community, society, nation, world or environment proves to be important for sustainable social business models. 3.8 percent of all enterprises in Southeast Asia are social enterprises and only half of them reinvest all of their profits towards their business purpose. Those who pursue both mission-orientation and profit-maximization tend to create self-sustaining social enterprises with new products and services, addressing social challenges, using new social business models and innovating working processes. With a random sample of 14,620 respondents from the five ASEAN countries Indonesia, Malaysia, Philippines, Thailand and Vietnam, we use linear regression to investigate if social value creation, social innovation and opportunity and skill perceptions increase the likelihood of social entrepreneurs to reinvest their profits towards their social or environmental goal, contributing more to their business purpose and as a result creating sustainable social enterprises. Our findings highlight the importance of social rather than environmental value creation and social innovation, specifically producing innovative products and services, to motivate entrepreneurs to reinvest all profits towards their social business purpose.

Keywords: social entrepreneur; social value creation; social innovation; ASEAN, Global Entrepreneurship Monitor (GEM).

1. Introduction

The Asia Development Bank (ADB) describes social enterprises as self-sustaining businesses that address social or environmental concerns and at the same time provide jobs, goods, and services (British Council and others, 2021). Typically, social enterprises follow the two purposes of (1) profit maximization and (2) addressing social and environmental purposes by reinvesting towards their purpose (Kim and Lim, 2017). A more narrow definition of social entrepreneurship however only applies to 50 percent of the social entrepreneurs globally, namely those reinvesting all of their profits towards their social or environmental goal (Bosma and others, 2016). Like traditional entrepreneurs, social entrepreneurs tend to have innovative thoughts

and decision-making, yet for social purposes, and are the originators for the majority of social innovations (Kim and Lim, 2017; Lim and Endo 2016). To solve social problems, social entrepreneurs create new products and services by using new appropriate technologies. In addition, they innovate in new social service models and new working processes (Kim and Lim, 2017).

All social enterprises are affected by diverse contextual complexities to sustainably pursue both social and economic missions (Miller and others, 2012). In a global comparison, Southeast Asia is the region with the lowest number of social entrepreneurs at just 3.8 percent of the working-age population (Bosma and others, 2016). British Council and others (2021) roughly estimate the number of social enterprises across Southeast Asia between 500,000 and 1 million enterprises. The majority of these relatively few social enterprises are limited in growth due to constraints in accessing finance, gaps in innovative financial approaches to access additional capital, lack of knowledge about the social enterprise ecosystem, and lack of data on the impact of their social enterprise (ADB, 2019). All Southeast Asian countries require more and better support models to help scale up social enterprises from startups or social groups to investable businesses (Lien Centre for Social Innovation, 2014), making them more sustainable as they currently are. The majority of social entrepreneurs in the Asia-Pacific region is not able to sustain their business beyond the initial startup phase to an established business phase (Guelich and Bosma, 2019). A research gap exists on social entrepreneurship activities in Southeast Asia specifically and what the drivers are for the sustainability of social enterprises by reinvesting profits towards their social or environmental goal. This empirical study utilizes a random sample of 14,620 respondents, collected in the five ASEAN countries Indonesia, Malaysia, Philippines, Thailand and Vietnam. We use linear regression to determine what triggers social entrepreneurs to reinvest their profits towards their social and environmental goal, be it social value creation, social innovation in products and services and/or their own perceptions about their skills and opportunities.

2. Objective

(1) To find determinants that increase the likelihood of social entrepreneurs to reinvest and contribute more to their business purpose and as a result creating sustainable social enterprises.

(2) To investigate potential influencing factors for social entrepreneurs to reinvest towards their social or environmental goal.

3. Literature Background

Social entrepreneurship as a subfield of entrepreneurship study and practice is centered between a non-profit enterprise with a strategy to earn income and a for-profit enterprise with social mission-driven strategies (Barton and others, 2018). Increasingly, organizations adopt the term ‘social enterprise’ for business activities that entail both revenue-producing as well as inclusive businesses (Lien Centre for Social Innovation, 2014). Asia Development Bank as a key promoter of inclusive businesses in the region, sees their potential for broader social impact and contribution to poverty reduction. Especially if inclusive enterprises are financially sustainable

enterprises which intentionally generate positive social or environmental impact, these social enterprises are also recognized for their potential to achieve the regional development goals (ADB, 2019). This is supported by Barton and others (2018) who find profound implications in the economic system through social entrepreneurship, namely creating new industries, validating new business models, and allocating resources to neglected societal problems.

3.1 Reinvesting profits towards the business purpose

In Southeast Asia, philanthropy and giving are widespread and common, stemming from religious, historical and cultural traditions. Especially philanthropy has been contributing to the development of the region, but –in the way it is practiced in the region- is unlikely to lead to the necessary changes, being able to address the many large-scale, persisting und further emerging social and environmental problems in the Southeast Asian countries, which rather require solutions from social enterprises (Lien Centre for Social Innovation, 2014). One connection between social entrepreneurship and philanthropy is the similar focus on opportunity and sustainability creation with broader cultural values and societal interactions (Acs and others, 2013). Different types of social enterprise values are found to influence local and regional developments. Economic value is not only created by (1) producing goods and services, strengthening both the enterprise itself and its competitiveness, or by (2) job creation for marginalized people, including training and support in job finding, but also by (3) providing economic and social development through grants, among others by foundations, and microfinance or low-interest loans (Kim and Lim, 2017). If a social enterprise can break even or make a profit, its funding becomes sustainable and makes this business less dependent upon donor funds or grants. Potentially, a mechanism is created that provides more opportunities, going beyond charitable and philanthropic principles (Acs and others, 2013). Marshall (2011) identifies that a positive engagement and communication behavior towards educated consumers, in blogs and in compelling narratives of their social goals, helps social entrepreneurs to resolve, or at least to reduce, the potential conflict between social and profit goals they might experience.

3.2 Social Value Creation

Distinctions between social entrepreneurship and so-called commercial or traditional entrepreneurship are often blurry. Some researchers consider economic value to be an entirely different entity than social value, whereas others regard economic value as a type of social value, and yet other scholars find themselves somewhere in between. Therefore, identifying the relationships between social and commercial entrepreneurship and the resulting implications remains critical for understanding social impact and value (Acs and others, 2013). Social entrepreneurs who target long-term value creation aim to optimize not only their social and environmental value but also their financial value to transition the enterprise to a more sustainable economic model and, in series, be able to reinvest the profits towards their social / environmental purpose (Schoenmaker and Schramade, 2019). How and if social and environmental dimensions can be materialized not only depends on the context, the industry and the nature of the industry, but also on local conditions and company-specific features such as the business model. Typically, social value addresses needs within a society, often solutions for welfare state problems and lack in public sector social services, fostering social inclusion, social cohesion and social capital (Kim and Lim,

2017). Environmental value on the other hand promotes and practices, among others, environmental sustainability, the implementation of recycling systems, and green environmental activities and actions.

Acs and others (2013) point out a research gap that goes beyond economic value and exploring different types of value creation relative to the entrepreneurial impact. No previous research was found that investigated if social value creation or environmental value creation has a higher impact on the entrepreneur's mindset to reinvest profits towards the business purpose. As social entrepreneurship and philanthropy both focus on opportunity and sustainability creation with broader cultural values and societal interactions (Acs and others, 2013), we argue that a focus on social value rather than on environmental value might be a predictor to reinvest the profits towards the business purpose. We hypothesize, that

H1: Businesses with more emphasis on social value than on environmental value have a significant positive impact on the reinvestment of profits towards the social business purpose.

3.3 Social Innovation

Social innovation can be interpreted as fostering inclusion and wellbeing by improving relations with society and/or environment and utilizing empowerment processes. By doing so, entrepreneurs imagine and pursue a 'better' community, society, nation, world or environment, which they regard as being more socially inclusive (Groot and Dankbaar, 2014). Social enterprises operate their businesses in all business sectors, from traditional sectors such as agriculture and healthcare to newer sectors such as clean energy and re-use of materials. Common and important characteristics of many social enterprises are the use of creativity and innovation (British Council and others, 2021). From an entrepreneurial point of view, social innovation can be regarded as value creation with the question who gains from innovation. The Schumpeterian view of innovation that inventions that are not considered valuable by the markets, will not become innovations, does not investigate what leads to value creation. Schumpeter (1909) already noted the existence of altruistic or social wants which are fulfilled rather by individual persons or businesses than by the society itself. Despite an increasing number of social innovation and social entrepreneurship activities, many of them are not developing to be sustainable in their efforts to address social or environmental needs. Among others, barriers include limited access to funding, few role model social entrepreneurs who were able to scale, insufficient skills and missing networks (Crupi and others, 2021). In times of crisis, such as the current Covid-19 pandemic, social innovation can be pushed to light by responding to critical needs and resource scarcity when pre-existing solutions in the market demand for more innovative and newer approaches.

An emerging view in the recent business and management literature shows that creating both economic and social value are not two different concepts but can also be combined (Van der Have and Rubalcaba, 2016). Some view value creation as the introduction of a new product, service or process which could have a spillover effect to society, whereas others attribute social innovation to directly addressing societal or environmental needs or problems, thus contributing to a social goal and creating value by meeting these demands. Finally, some innovators are able to create both positive social value and monetary value in exchange (Van der Have and Rubalcaba, 2016). Thus, we hypothesize that

H2: Social innovation by creating new products or services has a significant positive impact on the reinvestment of profits towards the social or environmental business purpose.

3.4 Opportunity and Skills Perceptions

Entrepreneurial intentions, applied to social entrepreneurship, are triggered by previous entrepreneurial experience, entrepreneurial education and self-efficacy or pro-activeness as important enablers (Barton and others, 2018). Generally, entrepreneurs possess the ability to identify customer needs and gaps in the market. Social entrepreneurs' opportunity recognition often stems from well-informed and ethically, socially and/or environmentally aware consumers. To be able to reinvest towards their purpose, social entrepreneurs need a specific set of skills which allows them to manage both the inherently competing demands stemming from social missions and financial means as two different challenges (Smith and others, 2012). Without these relevant skills, social entrepreneurs tend to concentrate on being either social mission-driven or purely commercial and profit-oriented.

Smith and others (2012) identify three interrelated necessary leadership skills to address these challenges as 'accepting', 'differentiating', and 'integrating' competing demands. Skill 1 'acceptance' requires to accept the two different sides of the competing demands –mission- versus profit-driven. If both can be accepted, social entrepreneurs will identify new opportunities rather than obstacles which in series makes them more innovative. Acceptance for social entrepreneurs means embracing paradoxical thinking and open-mindedness. Skill 2 'differentiation' allows the social entrepreneur to recognize the differentiated value of the two demands. As a result, the business will stay focused and challenged to addressing and achieving both goals. Finally, skill 3 'integration' means bringing the two conflicting demands together to address and overcome the conflict between achieving social mission and commercial profit. For integrative skills, social entrepreneurs need both refined interpersonal skills and decision-making skills (Smith and others, 2012). Little research investigates which skills are needed for a social entrepreneur who wants to attend to both, namely reinvesting their profits towards their social or environmental goal.

Opportunity perception is a creative and dynamic process and depends on an individual's abilities to detect and to explore them (Martinez and others, 2019). Social entrepreneurs tend to find opportunities in areas where commercial entrepreneurs might only perceive problems, such as environmental problems or health issues. Nevertheless, a perceived problem has the potential to become an opportunity for a differently minded social entrepreneur. We therefore hypothesize, that

H3: An entrepreneur's skill and opportunity perceptions have a significant positive impact on the reinvestment of profits towards the social or environmental business purpose.

4. Research Methodology and Data

Data used in this study are from the Global Entrepreneurship Monitor (GEM) project, an ongoing large-scale research project, designed to collect data on entrepreneurial activities, aspirations and behavior across countries. Each year, a random representative sample of the adult population (age 18 to 64) is surveyed in each

country to identify individuals who, at the time of the survey, owned and managed a business or were in the process of starting one (Bosma, 2013). GEM national teams across the globe collect individual-level data on an annual basis and analyze entrepreneurial activity across countries and the factors that make a country entrepreneurial. Each participating GEM national research team undertakes the Adult Population Survey (APS) along with a National Expert Survey (NES). The APS questions, which include the variables used in this study, are answered by a random sample of a minimum of 2000 adults per country, and concern their engagement in entrepreneurial activity and their attitudes towards entrepreneurship. The total sample size for the APS of the five ASEAN countries Indonesia, Malaysia, Philippines, Thailand and Vietnam in the year 2015, that included a special question set with regard to social entrepreneurship, accounts for 14,620 respondents, of which 464 were social entrepreneurs, who -alone or with others- were currently trying to start or currently leading any kind of activity that has a social, environmental or community objective. Each entrepreneur was asked if they reinvest all of their profits towards their social and environmental goal.

Linear regression analysis was used to answer the question whether social value creation (1 independent variable), social innovation in products and services (6 variables) and/or their perceptions towards their skills and opportunities (2 variables) predict if social entrepreneurs reinvest their profits towards their social and environmental goal. In the model summary, R-Square, as overall measure of the strength of the association, determined the proportion of variance in the dependent variable, predicted from the independent variables. ANOVA was used to predict the dependent or outcome variable with an indication of the statistical significance of the regression model of less than 0.05. The dependent variable DV was “reinvesting profits for social and environmental goals”. The independent variables ‘business puts more emphasis on social value than on environmental value’, ‘business operates in the market by producing goods and services’, ‘business offers products or services that are new to the market’, ‘business offers a new way of producing a product or service’, products / services are new to all or some customers’, and ‘newest or new technology use’ were answered on a scale of 5 from ‘strongly disagree’ to ‘strongly agree’. ‘Opportunity perception’ and ‘skills and experience perception’ were dummy variables.

5. Results

The overall model was significant and the R Square values exhibit that a variance of 38.1% in the overall model summary is accounted for by the entrepreneurs to reinvest their profits towards their social or environmental goals. The objective of this study to find determinants that increase the likelihood of social entrepreneurs to reinvest and contribute more to their business purpose and as a result creating sustainable social enterprises was met in three predictors. (1) The regression results show significance for businesses with social value creation over environmental value creation with .109/.045 (Table 1) which supports hypothesis *H1*, that *businesses with more emphasis on social value than on environmental value have a significant positive impact on the reinvestment of profits towards the social business purpose.*

In addition, two of the six independent variables in the social innovation category were significant, namely enterprises which operate in the market by producing products or services show a significant relation with .139/.027 to reinvesting their profits, and -even stronger (.406/.000)- those who do so in an innovative new way. Thus, hypothesis *H2: Social innovation by creating new products or services has a significant positive impact on the reinvestment of profits towards the social or environmental business purpose*, is confirmed for these two variables. Hypothesis *H3: An entrepreneur's skill and opportunity perceptions have a significant positive impact on the reinvestment of profits towards the social or environmental business purpose*, was not confirmed, as both opportunity perception and skill perception were not significant.

Table 1: Linear regression results with DV 'reinvesting profits for social and environmental goals'

Predictor Category	Independent Variables	Beta	Sig
Social value creation	Business puts more emphasis on social value than on environmental value	.109	.045
Social innovation in products and services	Business operates in the market by producing goods and services	.139	.027
	Business offers products or services that are new to the market	.054	.407
	Business offers a new way of producing a product or service	.406	.000
	Products / services are new to all or some customers	.016	.772
	Newest or new technology use	.010	.887
	No or few competitors	.010	.886
Opportunity and skills perceptions	Opportunity perception	-.064	.165
	Own skills and experience perception	.000	.998

To increase the relatively low social entrepreneurship rates in Southeast Asia with a sustainable business model in a more narrow definition of social enterprises, namely reinvesting profits towards their social or environmental goals (Bosma and others, 2016), it is important to understand the success factors that lead to this specific type of entrepreneur. Our findings show that at least three influencing factors are prevalent in this process: (1) the business puts more emphasis on social value than on environmental value; (2) the business operates in the market by producing goods and services, and (3) the business offers a new way of producing a product or service.

6. Conclusions and Suggestion

One objective of this exploratory study was to find determinants that increase the likelihood of social entrepreneurs to reinvest and contribute more to their business purpose and as a result create sustainable social enterprises. Three factors have been found to positively influence an increase in these types of social entrepreneurs. The first, social value creation, implies the goal of generating social value as a crucial resource for social entrepreneurial activities, such as improving societies by boosting social capital and societal linkages. The findings that social value creation rather than environmental value creation has an impact on sustainability of ventures, supports Acs and others (2013), who suggested to investigate different types of values, for example

social or environmental values, for their impact strength on reinvesting profits. Second and third, the role of social innovation for entrepreneurs proves to be important for sustainable social business models: (2) Being active in the market by producing goods and services, and (3) especially by offering a new way of producing these products or services, social enterprises tend to be more innovative compared to others. These social entrepreneurs value their impact as socially inclusive and - at the same time- increase their likelihood for a profitable business model. The combination of a business that generates profit and contributes to a social purpose will create greater social impact, especially if profits are reinvested towards the business purpose. Our findings support the Schumpeterian view, that the adoption of a new product or service by the customers and the markets is needed to become an innovation. Therefore, social entrepreneurs who are able to sell their innovative products in the markets, are also more likely to contribute towards their business purpose.

In addition, we investigated potential influencing factors for social entrepreneurs to reinvest towards their social or environmental goal. Despite findings by Smith and others (2012) that a specific set of skills is needed for social entrepreneurs to being both mission-driven and profit-oriented, our study did not support these findings. However, the research of Smith and others (2012) is based on student groups in the US, studying social entrepreneurship, whereas our data focuses on social entrepreneurs, age 18 to 64, in five ASEAN countries. The US have one of the highest social entrepreneurship rates of 11 percent globally, whereas Southeast Asia has the lowest with 3.8 percent of the adult population (Bosma and others, 2016). This could also point to different types of social entrepreneur being active in the US and Southeast Asia. Both skill perception and opportunity perception were no predictors for the reinvestment of profits, even though social entrepreneurs tend to see opportunities where traditional entrepreneurs might see problems (Martinez and others, 2019).

Crupi and others (2021) point out that -despite an increasing number of social innovation and social entrepreneurship activities, many of them are not sustainable and able to address their business purpose. This is especially important in times of a crisis, where new and innovative products and services can deliver solutions to critical needs and resource scarcity, which pre-existing solutions in the market are not able to. Integrating the current pandemic challenges on enterprises in general and on social enterprises in specific, Dr. Sara Bouchon, Head of Market Intelligence at Luxinnovation, Luxembourg's national innovation agency, addresses "Before the pandemic, we spoke about innovation as a way of improving products and services. Now, we focus more on innovative business models, innovative ecosystems and innovation in policy and decision making" (Luxembourg Trade & Invest, 2019). As the pandemic also created more polarization and inequalities in most societies, it is even more important that innovative business model approaches for social entrepreneurs are fostered by governments, organizations and educational institutions to increase the number of social enterprises who reinvest their profits towards their purpose for greatest benefits.

As our data were collected in five ASEAN countries, a generalization might be possible to the other five ASEAN countries, but might be difficult for other regions across the globe. In addition, the data were collected in 2015, as only this year provided a special question set with regard to social entrepreneurship. The development of social enterprises and the awareness towards the importance of sustainability has continuously

increased over the years and newer data might reveal different and new findings. However, the results of the study are valuable for both academia and practitioners. The finding, that operating in the market by producing goods and services and doing so in an innovative way as a predictor for social entrepreneurs to reinvest their profits for their purpose, needs further exploration. Clearly, it is necessary to be in a market with products or services to make a profit and in series to be able to reinvest. However, a deeper investigation is needed to specify what exactly needs to be done in the market to strengthen this finding. More detailed research should be conducted to find the relevance of specific skills for the reinvestment of profits as mentioned by Smith and others (2012), since our study only asked for a general skill perception.

In practice of higher education, the findings suggest to incorporate training on innovation mind-set building and supportive framework conditions. Further studies could investigate the interplay between the level of education and innovation in products and services to find more reasons, what specifically triggers the purpose to reinvest profits. Overcoming the innovation obstacle for social enterprises can lead to a sustainable economic business development with higher profitability and more value-added goods and services, especially in the demanding environment of a global pandemic. Additional findings on the interplay between social enterprises, universities, governments and organizations targeting social initiatives could help to empower social entrepreneurs to a new level in the Southeast Asian region.

7. References

- Acs, Z. J., Boardman, M. C., & McNeely, C. L. (2013). The social value of productive entrepreneurship. *Small Business Economics*, 40(3), 785-796.
- ADB Asian Development Bank (2019). *Road Map for Strengthening Social Entrepreneurship in the Philippines*. [Online]. Retrieved September 1, 2021, from DOI: <http://dx.doi.org/10.22617/BRF190127>
- Barton, M., Schaefer, R., & Canavati, S. (2018). To be or not to be a social entrepreneur: Motivational drivers amongst American business students. *Entrepreneurial Business and Economics Review*, 6(1), 9-35.
- Bosma, N. (2013). The Global Entrepreneurship Monitor (GEM) and its impact on entrepreneurship research. *Foundations and Trends in Entrepreneurship*, 9(2).
- Bosma, N., Schøtt, T., Terjesen, S., & Kew, P. (2016). *Special Topic Report Social Entrepreneurship* [Online]. Retrieved February 27, 2021, from: <https://gemconsortium.org/report/49542>
- British Council, UNESCAP, & Social Enterprise UK (2021). *The state of social enterprise in Southeast Asia* [Online]. Retrieved September 1, 2021, from: <https://seads.adb.org/report/state-social-enterprise-south-east-asia>
- Crupi, A., Liu, S., & Liu, W. (2021). The top down pattern of social innovation and social entrepreneurship. Bricolage and agility in response to COVID19: cases from China. *R&D Management*.
- Groot, A., & Dankbaar, B. (2014). Does social innovation require social entrepreneurship?. *Technology Innovation Management Review*, 4(12).

- Guelich, U. and Bosma, N. (2019). *Youth Entrepreneurship in Asia and the Pacific 2018/2019* [Online]. Retrieved February 27, 2021, from: <https://gemconsortium.org/report/50262>
- Kim, D., & Lim, U. (2017). Social enterprise as a catalyst for sustainable local and regional development. *Sustainability*, 9(8), 1427.
- Lien Centre for Social Innovation. (2014). *From charity to change: Social investment in selected Southeast Asian Countries* [Online]. Retrieved March 9, 2016, from: http://ink.library.smu.edu.sg/lien_reports/11/
- Lim, S. H., & Endo, C. (2016). The development of the social economy in the welfare mix: Political dynamics between the state and the third sector. *The Social Science Journal*, 53(4), 486-494.
- Luxembourg Trade & Invest (2021). *Business opportunities after Covid-19*. [Online]. Retrieved 13 September 2021, from <https://www.tradeandinvest.lu/news/business-opportunities-after-covid-19/>
- Marshall, R. S. (2011). Conceptualizing the international for-profit social entrepreneur. *Journal of Business Ethics*, 98(2), 183-198.
- Martínez, C. N., Bañón, A. R., & Laviada, A. F. (2019). Social Entrepreneur: Same or Different from the rest?. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 30(3), 443-459.
- Miller, T.L., Grimes, M.G., McMullen, J.S. and Vogus, T.J. (2012). Venturing for others with heart and head: how compassion encourages social entrepreneurship. *Academy of Management Review*, 37(4), 616-640.
- Schoenmaker, D., & Schramade, W. (2019). Investing for long-term value creation. *Journal of Sustainable Finance & Investment*, 9(4), 356-377.
- Schumpeter, J. (1909). On the concept of social value. *The quarterly journal of economics*, 23(2), 213-232.
- Smith, W. K., Besharov, M. L., Wessels, A. K., & Chertok, M. (2012). A paradoxical leadership model for social entrepreneurs: Challenges, leadership skills, and pedagogical tools for managing social and commercial demands. *Academy of Management Learning & Education*, 11(3), 463-478.
- Van der Have, R. P., & Rubalcaba, L. (2016). Social innovation research: An emerging area of innovation studies?. *Research Policy*, 45(9), 1923-1935.

KNOWLEDGE AND ATTITUDE OF THAI COMMUNITY ENTERPRISE GROUPS TOWARDS PERSONAL INCOME TAX SYSTEM

Assistant Professor. Arthit Sutjasen

Rajamangala University of Technology Srivijaya

E-mail: arthitgolden@gmail.com

Arporn Klaewtanong, Ph.D.

Rajamangala University of Technology Srivijaya

E-mail: applewan123@hotmail.com

ABSTRACT

This study aimed to investigate the level of knowledge and attitude towards personal income tax system of the community enterprise groups in Khanom district, Nakhon Si Thammarat province, to compare the knowledge about the personal income tax system and attitude towards personal income tax system of the community enterprise group by classifying as career, income, educational level, and duration of working, and to study the relationship between the knowledge about the personal income tax system and the attitude towards personal income tax system of the community enterprise groups. Descriptive statistics were analyzed in this study. The sample used was totally 70 community enterprise groups in Khanom district, Nakhon Si Thammarat province since 2020.

The study found that the leaders of the community enterprise group entirely knew about the personal income tax system at a moderate level. The leaders of the community enterprise group who were different in career, income, educational level and duration of working had indifferent knowledge about personal income tax system. When considering in each aspect, it was found that the leaders of the community enterprise group who were different in career had a statistically significant difference in knowledge of tax filing at 0.05 level. Moreover, the leaders of the community enterprise group who were different in income, educational level, and duration of working had a statistically significant difference in knowledge of tax filing at 0.05 level. The leaders of the community enterprise group had the attitude towards personal income tax system at a moderate level. When considering in each aspect, it was found that their attitude towards personal income tax system was at a good level. Their views showed that the payment of personal income tax was an important matter, and realized that paying tax was worthy. However, the attitude towards the government tax collection, that it would be corrupted rather than exploited, showed at a poor level. The leaders of the community enterprise group who were different in duration of working had a statistically significant difference in attitude towards personal income tax system at 0.05 level. However, the leaders of the community enterprise group who were different in career, income, and educational level had no difference in attitude towards personal income tax system. The knowledge of personal

income tax system was not correlated with the attitude towards personal income tax system of the leaders of the community enterprise group.

Keywords: knowledge, attitude, personal income tax, community enterprise

1. Introduction

According to Community Enterprise Promotion Act B.E. 2548 (2005), the purposes of the government are to promote and strengthen growth of the community enterprises and to encourage the community enterprises in the forms of ordinary partnership and groups of non-juristic people to make the personal income tax payment as prescribed by laws. Previously, the government alleviated their tax burden by Revenue Department issuing the ministerial regulation No. 330 B.E. 2560 (2017) to extend the period of income tax exemption for the community enterprises. Under the Community Enterprise Promotion Act, the ordinary partnerships or groups of non-juristic people with the assessable income not more than 1,800,000 baht per tax year were exempted from income tax payments for 3 years. At present, the government extensively alleviates their tax burden by Ministry of Finance issuing the ministerial regulation No. 371 B.E. 2563 (2020) on 16th November 2020, under the revenue code on tax exemption. The tax exemption is extended for another period of 3 years only for ordinary partnerships or groups of non-juristic people with assessable income not more than 1,800,000 baht. Such extension is from 31st December 2019 to 31st December 2022 in order to promote and support the business of the community enterprises, and to develop and strengthen the community economy continuously. However, as the community enterprise is a type of businesses which generates income and employment in the community, this enterprise also has duty for tax payment according to the revenue code. The type of tax payment depends on particular community enterprises' models and transactions. When the business has registered with Department of Agricultural Extension as the community enterprise, it also has duty for tax payment.

The tax system is so important and has to be implemented thoroughly and seriously by the government sector. This research was interested in studying about the tax knowledge and attitudes of the communities enterprises at Khanom District, Nakhon Si Thammarat Province. The purposes were to investigate whether they had knowledge and understandings about the personal income tax system or not; how their attitudes towards the personal income tax system.

2. Research Objective

(1) To examine about the community enterprises' level of knowledge and attitudes towards the personal income tax system

(2) To compare the community enterprises' knowledge of the personal income tax system and their attitudes towards the personal income tax system with the classification of occupations, income, educational levels, and occupational periods

(3) To examine the relationship between the community enterprises' knowledge of the personal income tax system and their attitudes towards the personal income tax system

3. Literature Review

3.1 Definition

Knowledge refers to the expression of people's ability to learn and understand about legal rights and duties on the personal income tax as well as to apply such knowledge in compliance to their rights and duties. This knowledge can be classified into 3 aspects: general knowledge about the personal income tax; knowledge of expense deduction and tax deduction; and knowledge of tax filing.

Attitudes refer to thought and opinions the community enterprises on the personal income tax system in a positive/negative or agree/disagree way.

3.2 Previous Research, Hypothesis and Framework

Teeratansirikun & Puthrat (2016) The knowledge and attitudes of people submitting the personal income tax filing at Surat Thani Revenue Office 2. Their study found that these people had the overall knowledge of the personal income tax filing at Surat Thani Revenue Office 2 at the moderate level

Yosrikun (2019) The personal income taxpayers at Nakhon Ratchasima Province had knowledge and understanding of the new 2017 tax structure at the moderate level due to Revenue Department's continuous implementation on development and promotion to disseminate tax knowledge thoroughly through the online service on the official website of Revenue Department.

Suksawad (2020) The effects of the knowledge and understanding of the taxpayers on the attitudes towards the personal income tax payment at Bangkok Revenue Office 13 (Khlong Toei). His study found that the samples possessed knowledge and understanding of the personal income law at the moderate level

Research Hypotheses

The leaders of the community enterprises have a little level of knowledge about the personal income tax system.

The leaders of the community enterprises have negative attitude towards the personal income tax system.

Knowledge of the personal income tax system and attitudes towards the personal income tax system of the leaders of the community enterprises are different when being classified by occupations, income, educational levels, and occupational periods.

Knowledge of the personal income tax system and attitudes towards the personal income tax system of the leaders of the community enterprises have inter-relationship at the low level.

Research Conceptual Framework

According to the literature review on related concepts and theories, the researcher developed the research conceptual framework for this study as illustrated in the following figure.

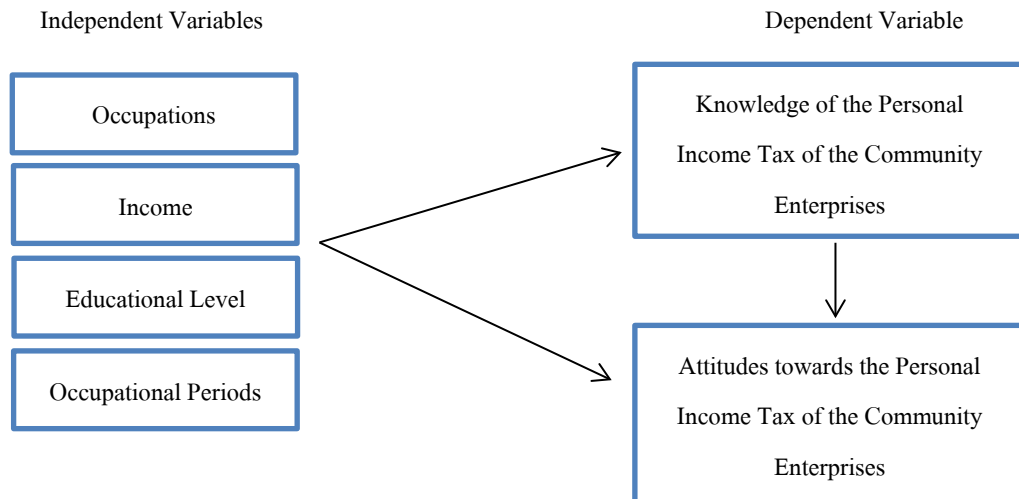


Figure 1 Research Framework

4. Research Methodology

4.1 Population and Samples

The population of the study included 70 community enterprises at Khanom District, Nakhon Si Thammarat Province

The samples were the leaders of 70 community enterprises at Khanom District, Nakhon Si Thammarat Province.

4.2 Research Instrument

This study was a descriptive research by using a 4-part questionnaire as the research instrument for data collection. The instrument was researcher-designed by basing on the related concepts, theories, and previous research. The instrument is described as follows.

Part 1 was the checklist questionnaire used to collect the data about the participants' statuses i.e. occupations, incomes, educational levels, and occupational period.

Part 2 was the multiple-choice test with 3 options. It was used to test the knowledge about the personal income tax system of the community enterprise leaders in 3 dimensions as follows.

Dimension 1: General knowledge about the personal income tax was in 5 items: Items No. 1, 2, 3, 4, and 13.

Dimension 2: Knowledge about an expense deduction and tax deduction was in 7 items: Items No. 5, 6, 7, 8, 9, 10, and 11.

Dimension 3: Knowledge about tax filing was in 8 items: Items No. 12, 14, 15, 16, 17, 18, 19 and 20.

Part 3 was the 5-level rating scale questionnaire about positive/negative attitudes towards the personal income tax system of the community enterprise leaders.

Part 4 was the open-ended questionnaire about additional opinions of the community enterprise leaders. The collected data about their additional opinions were used in the result discussion.

Instrument development and validation

The researcher-designed questionnaire was developed and validated as the description below.

The test on knowledge about the personal income tax system was based on the concepts, theories, laws, and academic principles concerning with the personal income tax system according to the revenue code, documents, textbooks, academic journals, and previous research. After the test was developed according to the contents scope, it was validated by the experts, and improved by basing on the experts' suggestions. After the revision, the test was revalidated by the experts on the content validity, wording, and assessment. Then, it was revised accordingly before being trialed with another group of people, not included in the same group of 40 samples, in Nakhon Si Thammarat Province. Next, the tested data were analyzed for values of item difficulty, item discrimination, and test reliability by using the SLA (Simple Items Analysis) program. The analyzing results showed the item difficulty at the range of 0.20 – 0.80, the item discrimination at 0.20 – 1.00, and the test reliability at 0.63.

The questionnaire for measuring the attitudes of the community enterprise leaders towards the personal income tax was based on the concepts, theories, laws, and academic principles concerning with the personal income tax according to the revenue code, documents, textbooks, academic journals, and previous research. The collected data was processed to determine the instrument structure and the content scope according to the suggestions of the experts. After that, the questionnaire was developed by basing on the content scope before being validated by the experts and improved according to the experts' suggestions. Next, it was revalidated by the experts on content validity, wording, and assessments. Then, it was revised and calculated for the IOC. Only the items with IOC over 0.60 were used. The revised questionnaire was trialed with another group of people, not included in the same group of 40 samples, in Nakhon Si Thammarat Province. Next, it was calculated for reliability by using alpha coefficient of Saiyos and Saiyos (2003, pp. 200) and found the reliability at 0.82.

Scoring criteria

The researcher set the scoring criteria as follows.

(1) For the test in Part 2 on general knowledge of the personal income tax system, the correct answer of each item was scored 1 point whereas the wrong answer was scored 0 point.

(2) For the 5-level rating scale questionnaire in Part 3, the scoring criteria were as follows.

Strongly agree	=	5	points
Agree	=	4	points
Uncertain	=	3	points
Disagree	=	2	points
Strongly disagree	=	1	point

Interpretation criteria

(1) The criteria for classifying knowledge about the personal income tax system were based on means (\bar{X}) and standard deviation (S.D). The knowledge was classified into 3 levels (Kitpreedaborisut, 2000, pp. 284) as follows.

Scores more than $\bar{X} + 0.5 \text{ S.D.}$	=	the high knowledge level
Scores between $\bar{X} \pm 0.5 \text{ S.D.}$	=	the moderate knowledge level
Scores less than $\bar{X} - 0.5 \text{ S.D.}$	=	the low knowledge level

In this study, the knowledge of the personal income tax system was found at $\bar{X} = 11.81$ and S.D. = 3.55.

From all 20 items, the knowledge of the community enterprise was classified into 3 groups as below.

Scores less than 10.00 points	=	the low knowledge level
Scores between 10.00 – 13.60 points	=	the moderate knowledge level
Scores more than 13.60 points	=	the high knowledge level

(2) The criteria for determining the extent of attitudes towards the personal income tax system were based on means (\bar{X}) and standard deviation (S.D), according to Best's (1970) criteria as follows.

Mean 1.00 – 1.49	=	the very negative attitude level towards the personal income tax
Mean 1.50 – 2.49	=	the negative attitude level towards the personal income tax
Mean 2.50 – 3.49	=	the neutral attitude level towards the personal income tax
Mean 3.50 – 4.49	=	the positive attitude level towards the personal income tax
Mean 4.50 – 5.00	=	the very positive attitude level towards the personal income tax

(3) The criteria for determining the relationship level was based on the correlation coefficient. The correlation coefficient at 0 indicated that there is no relationship between variables. If it was not 0, the variables were related. The direction of the relationship was determined from the sign of the calculated correlation. If it was a plus (+) sign, two variables were related in the same direction. However, if it is a minus (-) sign, the variables were related in the opposite or invert direction. The relationship level was determined from the calculated correlation (Kanjanasri et al., 2001, pp. 65) as follows.

Correlation less than 0.30	=	the low relationship level of 2 variables
Correlation between 0.30 -0.70	=	the moderate relationship of 2 variables
Correlation more than 0.70	=	the high relationship level of 2 variables

4.3 Data analysis

In the data analysis, the data collected from the test and the questionnaire were organized, codified, and analyzed by using the SPSS for Windows (Statistical Package for the Social Sciences for Windows).

(1) The status data of the samples were analyzed in percentage and presented in tables with description.

(2) The knowledge and attitudes levels about the personal income tax system of the community enterprise leaders were calculated in means and standard deviation.

(3) The difference was compared between knowledge of the personal income tax system and attitudes towards the personal income tax system by classifying according to occupations, incomes, educational level, and occupational period by using One-Way ANOVA.

(4) The relationship between knowledge of the personal income tax system and attitudes towards the personal income tax system of the community enterprise leaders was analyzed with Pearson's Product Moment Correlation Coefficient and the multiple regression.

5. Research Findings

The data collected from 70 community enterprise leaders at Khanom District, Nakhon Si Thammarat Province were processed and presented in descriptive statistics as follows.

1. In the study, the community enterprise leaders were 36 male (51.43%) and 34 female (48.57%). Most of them were agriculturists (46 leaders, 65.71%), followed by sellers (20 leaders, 28.57%). Regarding income, community enterprise leaders (41 leaders, 58.57%) earned monthly income at 10,001 – 20,000 baht, followed by leaders (24 leaders, 34.29%) at 10,001 baht. About the educational level, most of them graduated at secondary level (44 leaders, 62.86%), followed by primary level (18 leaders, 25.71%). The longest occupational period was at 1 – 5 years (24 leaders, 34.29%), followed by 6 – 10 years (21 leaders, 30.00%).

2. In overall, the community enterprise leaders had the knowledge of the personal income tax system at the moderate level. Each knowledge aspect was at the moderate level as well.

3. In overall, the community enterprise leaders with differences in their occupations, income, educational levels, and occupational periods did not have difference in the knowledge of the personal income tax system. In each aspect, the community enterprise leaders with different occupations had significant difference in knowledge of tax filing at the statistical significance level of 0.05. Moreover, the community enterprise leaders with differences in their income, educational levels, and occupational periods had significant difference in their general knowledge of the personal income tax at the statistical significance level of 0.05.

4. The community enterprise leaders had the attitudes towards the personal income tax system at the moderate level. In each aspect, their attitudes towards the personal income tax system was at the positive level with necessity of the personal income tax payment, and goodness of the personal income tax payment. However, their attitudes towards corruption of the collected tax by the government rather use for benefits were at the negative level.

5. The community enterprise leaders with differences in their occupational periods had significant difference in their attitudes towards the personal income tax system at the statistical significance level of 0.05. However, the community enterprise leaders with differences in their occupations, income, and educational levels did not have difference in their attitudes towards the personal income tax system.

6. The knowledge of the personal income tax system did not have relationship with the attitudes towards the personal income tax system of the community enterprise leaders.

6. Discussion

The results of the study with the community enterprise leaders at Khanom District, Nakhon Si Thammarat Province are discussed as follows.

1. The community enterprise leaders had the overall knowledge at the moderate level, and each knowledge dimension was at the moderate level as well. The results are consistent to the study of Teeratansirikun & Puthrat (2016) on the knowledge and attitudes of people submitting the personal income tax filing at Surat Thani Revenue Office 2. Their study found that these people had the overall knowledge of the personal income tax filing at Surat Thani Revenue Office 2 at the moderate level. In addition, the results are also consistent to the study of Suksawad (2020) on the effects of the knowledge and understanding of the taxpayers on the attitudes towards the personal income tax payment at Bangkok Revenue Office 13 (Khlong Toei). His study found that the samples possessed knowledge and understanding of the personal income law at the moderate level. Moreover, the study of Kanhasen (2012) found that the personal income taxpayers had the overall knowledge and understanding of the personal income tax calculation in Bangkok at the moderate level. According to the study of Yosrikun (2019), the personal income taxpayers at Nakhon Ratchasima Province had knowledge and understanding of the new 2017 tax structure at the moderate level due to Revenue Department's continuous implementation on development and promotion to disseminate tax knowledge thoroughly through the online service on the official website of Revenue Department.

Similarly, the study Chairatmethee (2010) found that the tax refund applicants in Ang Thong Province had the overall knowledge and understanding of the income tax calculation for refund at the moderate level because the principles of the personal income tax filing and payment were the general principles of the personal income tax according to the revenue code. Regarding the study of Pratanurarak (2002), the leaders of Production Saving Group in Samut Sakhon Province had knowledge of the personal income tax at the moderate level because Revenue Department did not disseminate tax knowledge earlier, people did not pay attention to it, and they felt bored of tax payment due to their perception that tax payment increased their burdens and expenses. At present, however, Revenue Department increasingly educates people through website, provides tax filing service online, and facilitates people more for information accessing channel and convenient tax filing.

2. The community enterprise leaders with different occupations did not have difference in the overall knowledge of the personal income tax system. This result is consistent to the study of Pratanurarak (2002) on the leaders of Production Saving Group in Samut Sakhon Province with different occupations did not have difference in their knowledge of the personal income tax because these leaders possessed similar characteristics and they got similar knowledge after trainings or development.

In each aspect, the community enterprise leaders with different occupations had difference in their knowledge of tax filing. Similarly, the study of Kongsan (2016) found that occupations had the negative relationship with the knowledge of personal income tax filing and payment. That study found the increasing number of the private company employees whereas the knowledge of the personal income tax filing and payment likely reduced.

3. The community enterprise leaders with different income did not have difference in the overall knowledge of the personal income tax system. In each aspect, the community enterprise leaders with different income had difference in the general knowledge of the personal income tax. These results are consistent to the

study of Thongplew & Chutimantapong (2012) which found that the difference in the personal income had effects on the perception of criteria for the different methods of the personal income tax calculation in assessable income, personal income tax rate, and tax filing. This might be because the taxpayers with monthly income less than 10,000 – 20,000 baht were inexperienced in tax filing and payment.

4. The community enterprise leaders with different educational levels did not have difference in the overall knowledge of the personal income tax system.

In each aspect, the community enterprise leaders with different educational levels had difference in the general knowledge of the personal income tax. According to the study of Maktuum & Penwuttikul (2020) on the factors affecting on the knowledge of the personal income tax filing at Military District 12, their knowledge of the personal income tax filing was significantly different according to their educational levels. The people graduated at postgraduate level had more knowledge of the personal income tax filing more than the people graduated at the certificate level, and the people graduated at the upper secondary levels had the least knowledge of the personal income tax filing. In the study of Yosrikun (2019), the people graduated at the upper secondary and bachelor levels had more knowledge of the personal income tax than the people graduated at the lower secondary and postgraduate levels.

Similarly, Dechpreecha (2018) studied on the factors affecting on the knowledge of the personal income tax of the public health personnel. In his case study at Phromkhiri Hospital in Nakhon Si Thammarat Province, the public health personnel with bachelor education had the knowledge in the personal income planning more than the personnel graduated at the certificate, diploma, or lower levels. This might be because the personnel with graduate or postgraduate education had more existing knowledge in various aspects including knowledge of the personal income tax. According to the study of Kongsan (2016), the positive relationship was found between the highest educational level with the knowledge level of the personal income tax filing and payment. If people had high education, their knowledge of the personal income tax filing and payment should be high too. High education facilitates new knowledge and understanding about the personal income tax filing and payment.

5. The community enterprise leaders with different occupational periods did not have difference in the overall knowledge of the personal income tax system. In each aspect, the community enterprise leaders with different occupational periods had difference in the general knowledge of the personal income tax. These results are consistent to the study of Pratanurarak (2002) which found that the members of the Production Saving Group in Samut Sakhon Province with different occupational periods had difference in their knowledge of the personal income tax system. Because the occupational period of 11 – 15 years was long and continuous for making tax payment so they understood about it more. Consistently, the study of Maktuum & Penwuttikul (2020) found that the knowledge levels of the officers at Military District 12 were different according to the operational periods. The officers with the operational periods of 11 – 20 years and 6 – 10 years gained more knowledge of the personal income tax filing than the officers with the operational period of more than 30 years, and the officers with the operational period of less than 5 years had the least knowledge of the personal income tax filing.

6. The community enterprise leaders had the attitudes towards the personal income tax system at the moderate level. Similarly, the study of Pratanurarak (2002) found that the members of Production Saving Group in Samut Sakhon Province had the attitudes towards the personal income tax system at the moderate level. This might be because more public relations was implemented for disseminating the information about taxes through the website of Revenue Department. This is consistent to the concept that attitude is not inherited from birth but it is shaped by experience and learning of a person so attitude is changeable. In the study of Teeratansirikun & Puthrat (2016), the overall attitude towards the personal income tax filing at Surat Thani Revenue Office 2 was at the positive level, and most of them had good attitudes towards the personal income tax filing but their knowledge of the personal income tax filing was at the moderate level.

7. The community enterprise leaders with different occupations had difference in their attitudes towards the personal income tax system. According to the study of Suksawad (2020), the attitudes towards the personal income tax attitudes were different according to their occupations. However, the study of Pratanurarak (2002) found that the members of Production Saving Group in Samut Sakhon Province with different occupational periods did not have differences in their attitudes towards the personal income tax system.

8. The community enterprise leaders with different occupations, income, and educational levels did not have difference in their attitudes towards the personal income tax system. These results are similar to the study of Pratanurarak (2002) which found that the members of Production Saving Group in Samut Sakhon Province with different occupations, income, and occupational periods did not have difference in their attitudes towards the personal income tax system. This is because attitude is formed by personal experience and learning and their feeling towards something is fostered in their mind permanently in an agreeable or disagreeable way. If people have particular perception on taxation in one way or another; it is possible for them to behave according to their existing feeling towards it whatever their occupations are, how much their income is, and how high their educational levels are.

9. The knowledge of the personal income tax system did not have any relationship with the attitudes towards the personal income tax system of the community enterprise leaders. This result contrasts to the study result of Teeratansirikun & Puthrat (2016) which found that the overall knowledge level of the personal income tax filing according to the revenue code had the same direction of the relationship with the attitudes towards the personal income tax filing at Surat Thani Revenue Office 2. Moreover, the study of Chairatmethee (2010) found that the number of trainings increased the trainees' knowledge with better attitudes, resulting in their voluntary tax payment correctly in full amount. According to the study of Suksawad (2020), the taxpayers did not have good attitudes towards the personal income tax payment, and such attitudes can be modified by giving additional information and more communication.

7. Suggestion

The study results are useful for related agencies such as Revenue Department, Department of Agricultural Extensions, and universities as guidelines for doing public relation by disseminating tax knowledge to people, especially to the community enterprises in the rural areas.

8. References

- Chairatmethee, A. (2010). *Knowledge and Understanding of Personal Income Tax Return Applicants towardss Income Tax Calculation for Tax Refund in Ang Thong Province*. Independent Study. Master of Business Administration. Kasetsart University.
- Dechpreecha, J. (2018). *Factors Affecting Knowledge and Understanding of Personal Income Tax in Public Health, A Study of Promkiri Hospital, Nakhon Si Thammarat Province*. Independent Study at the Faculty of Business Administration, Ramkhamhaeng University
- Kanhasen, S. (2012). *Knowledge and Understanding of Personal Income Tax Payers towardss Personal Income Tax Calculations*. Independent Study. Master of Accounting. Kasetsart University.
- Kongsan, N. (2016). *The Factor Influencing Perception of Personal Tax Payment: A Case Study of Hatyai City, Songkhla Province*. Master Thesis. Prince of Songkla University.
- Maktuum, S. & Penwuttikul, P. (2020). *Factors Affecting Knowledge and Understanding in Personal Income Tax Filing of the 12th Military Circle's Officers*. 11th National and International Conference.
- Pratanturarak, C. (2002). *Knowledge and Attitudes of Members of the Savings for Production Group in Samut Sakhon Province towardss Personal Income Tax System*. Master Thesis. Faculty of Business Administration. Nakhon Pathom Rajabhat University.
- Suksawad, W. (2020). Study of the taxpayers' understanding of Personal Income Tax that affects their perspective in tax payment of the Bangkok Revenue Department Area 13 (Klong Toei District). *Journal of Social Science and Humanities*. Southeast Asia University, 4(2), 1-7.
- Tangprakairoj, K. (2010). *Characteristics of Personal Income Taxpayers and Attitudes towardss Fairness of Taxation Measures in Aspect of Assessable Income Expenses, Abatements and Tax Rates*. Master of Accounting at the Faculty of Commerce and Accountancy. Thammasat University.
- Teeratansirikun, L. & Puthrat, S. (2016). *Journal of Humanities and Social Sciences*. Mahasarakham University, 35(6), 204-213.
- Thongplew, T. & Chutimantapong, N. (2012). *Factors Affecting the Recognition of Criteria for Calculating Personal Income Tax of Persons Submitting Personal Income Tax Returns in the Thonburi Area Bangkok (Research report)*. Bangkok: Research and Development Institute. Thonburi Rajabhat University.
- Yosrikun, C. (2019). Knowledge and Understanding of Personal Income Tax Collection According to the New Tax Structure of the Year 2017 of People in Nakhon Ratchasima Province. *Journal of Nakhonratchasima College*, 12(1), 205.

CONSUMING BEHAVIOR OF ELDERLY TOWARD ONLINE SHOPPING IN THAILAND

Assistant Professor Dr. Anupong Avirutha

Director, Sripatum Business Innovation Creativity and Incubation Center, and

Head of Digital Business Management Department, School of Business

Sripatum University

E-mail: anupong.av@spu.ac.th

Assistant Professor Supawadee Hamanee

Lecturer, Business Management Department, School of Business, Sripatum University

E-mail: Supawadee.ha@spu.ac.th

Assistant Professor Dr. Rachata Rungtrakulchai

Faculty of Business Administration, Thai-Nichi Institute of Technology

E-mail: rachata@tni.ac.th

Assistant Professor Dr. Prasert Sitthijirapat

Head of Management Department, School of Business, Sripatum University

E-mail: Prasert.si@spu.ac.th

Oyjai Maliwan

Lecturer, Digital Business Management Department, School of Business,

Sripatum University

E-mail: Oyjai.ma@spu.ac.th

ABSTRACT

This study attempts to study the purchasing behavior online shopping of elderly in Thailand. Elderly confronts several positive and negative aspects in their online shopping. The results of this study revealed that elderly consider the online shopping and their experience to be a positive factor. The respondents in this study must be residents of Bangkok, Thailand at the age between over 60 years old. The numbers of respondents are 250 respondents. The participants in this study are voluntary and anonymity. This study employed convenience sampling to collect data. The survey is expected to be responded by the one who has the experience with the online shopping. The numbers of respondents are 250 respondents. The most average spending for online shopping each time is 500 baths, the payment is made by credit card or debit card. The elderly shoppers have online shopping frequency more than once in a month. They mostly purchase product or service through online

once a month for household supply and groceries. Most of elderly consumers have considered when online shopping of how and where they purchase that is comparing price, and low price is the motivation for their purchasing. There are a few problems that elderly customers still have to face while shopping online, and the most problem was reported is that searching a product / service is ranked as the most problem

Keywords: Elderly, Online, Consumer Behavior

Introduction

Electronic commerce (e-Commerce) in Thailand is one of the largest growths in Southeast Asia countries (Potkin, 2016). A crucial factor leading the growth in e-commerce is the support from the government sector, with promotions targeting small and medium-sized businesses (Avirutha, 2017). Thai government expects the value of e-commerce in Thailand to exceed US\$30 billion annually by 2016 (Thailand focus, 2016), as the established national digital economy committee to coordinate policies to foster the growth of the country's digital economy. According to Frost & Sullivan, a research & consulting firm, the e-commerce market started showing solid growth in the Thai market less than four years ago. E-commerce in Thailand is projected to grow by 26.7% from 2019-2024. Specifically, the use of the Internet by older adults is growing at a substantial rate. They are becoming an increasingly important potential market for electronic commerce. Furthermore, the pandemic has hit the economies and consumer behavior also has changed drastically. This especially occurred for elderly consumers who have spent the greater part of their lives in an offline world. However, due to lockdowns and economic instability, they have been forced to change their consumption patterns in a very short period of time (Meiner, 2021).

According to Foundation of Thai Gerontology Research and Development institute (2021), reported that Thailand had a population of 69.3 million which became people who aged over 60 years around 11.16 million or 17.5 percent of the total Thai population. The World Bank (2016) estimated Thailand would be an aging society by growing the seniors to 17 million within 2040. As the number of senior populations is rising every year and will soon to be an aging society. The seniors group tends to be the opportunity target group for e-commerce and any company who want to sell their products online through online shopping in Thailand.

As Thailand is becoming an aging society and the trend of e-Commerce in Thailand is also growing, to better understanding and gaining insight of Thai elderly online shopping perception and behaviors is important since this group will be the majority target customer in the future. Therefore, the purpose of this study is to examine the consuming behavior of the elderly, and gain insightful to determine potential opportunities for e-commerce sector to engage in online shopping during the aging society. This will be benefit to many e-commerce businesses as well to capture this target segment.

Elderly and Online Shopping

Technology, and particularly the internet, has transformed consumer and business behaviors. Many studies over decades found that the older adults were less likely than younger adults to use technology (Mitzner, 2018; Gilly, 1985; Morris, 2000). Age is an important influence on technology adoption. According to Morris (2000), age is a factor affecting the adoption of new technology. Compared to older generations, the younger generations are more strongly influenced by attitude toward the adoption of new technology. Daly and Kitchell (1995) support that the age of the SME business founders is negatively related to technology adoption.

However, an ageing population is impacted by these contextual and operational changes. According to Smith (2018), senior citizens make up 28% of the population that participates in e-Commerce purchases. Additionally, baby boomers make up 41% of the e-Commerce market. These boomers, typically age 65-74, have seen an average 25% increase in their overall income since 2001. More than 50% of the global consumers responding to the June 2021 survey said they had used digital devices more frequently than they had six months earlier (World Economic Forum, 2021). With the outbreak of the new coronavirus and the requests that people refrain from going out, the amount of elderly using the internet is set to increase even faster. The relevance of this study has increased in the context of digital access and digital poverty during the COVID-19 pandemic.

Technology usage and awareness are increasing in the United Kingdom (UK) (internet sales were at 20 per cent of all retail sales in early 2020 and went up to 33% during the COVID-19 pandemic), making it the world's third largest e-commerce market and the most advanced e-Commerce market in Europe (National Statistics, 2020). A huge 75% of adults over the age of 75 use the internet each day, with senior citizens now representing almost a third (28%) of all ecommerce purchases (Lawrence, 2020). Americans 65 and older rang up an average of nearly \$187 per month online in 2020, up 60% from a year earlier (Anne, 2021).

e-Commerce is a new way of product selling using the Internet, computer networks and mobile application that allow customers, sellers and suppliers to make online business transaction (Fellenstein & Wood, 1999). Competition in the online business is typically high opportunities in the market. e-Commerce is certainly growing and increasingly including both large and small retailers, and the growth of e-commerce platforms such as Alibaba and Amazon are strongly influencing the competitive business environment (Hagberg et al., 2016). One reason that increased the consumers' interesting to shop on e-marketplace is that there are many retailers offering product ranges broader than one store can offer (Kestenbaum, 2017). e-Marketplace platform affects the traditional retail store business processes (Pantano and Viassone, 2015). There are many different types of e-Marketplace based on a range of business models. Theoretically, they can be broadly divided into two categories based on the way in which they are operated, which are vertical e-commerce, and horizontal e-commerce

1. Vertical e-marketplace

Vertical e-marketplace sells products from many sources but they are all of one type. Vertical e-marketplace is business niche where the vendor serves a specific audience and their set of needs. Typically, vertical e-marketplace relies on being able to sell the product better. Since they focus on one, or few, product

categories, they are able to underline the user experience in a way that highlights the special features of the product category.

2. Horizontal e-marketplace

Horizontal e-marketplace sells products of many types but they all share a characteristic. Consumers can view the products from different retailers or sellers all together and at the same time in the same app. Furthermore, the application features are able to focus on a type of customer and offers them multiple products across many types of retailers.

Customer Decision Making

Customers start searching information before making a decision to purchase product or service. Customers have evolved and no longer make purchasing decisions in a linear approach; they enter at various points, which are dependent on their first engagement with the brand, product research or word of mouth from their online society (Powers et al., 2012). The five-stage consumer decision making process was first introduced in 1910 by John Dewey (Bruner & Pomazal, 1988), and include: problem recognition, information search, evaluation of alternatives, purchase decision and post purchase behavior. Problem recognition is the situation when the consumers recognize their problems and what products to buy to solve these problems. When consumers are not satisfied with the product they have bought or the stored product has been used up or expired, the consumers will search for more information on the products, they will need to buy in the future. This condition complies with Kotler and Keller's (2009) and Hawkins and Mothersbaugh's (2013) found that recognition of problems of the consumer brings about their search for information on the product to be purchased. Recently, many consumers refer the product or service evaluations in reputation information (Cui, Lui, and Guo, 2012).

Online shoppers are more likely to search for product information. According to Bellman, Lohse, and Johnson (1999), the information search on the Internet is the most important predictor of online shopping behavior. Online consumers are spending time to get product information before they made a purchasing decision (Ward & Lee, 2000). Typically, with online shopping, consumers think that attractive factors are comparing price and wider choices. In a current study, consumers compared the price and brand of products through the different websites (Ray, 2007). Moreover, Donthu and Gracia (1999) find that online shoppers are economic shoppers, which are price and quality concerned, because they are usually looking for inexpensive products with excellent quality, and they are sensitive to the price of the product. Online shoppers tend to be influenced through certain channels over time among members of a social system (Rogers 1995). Consumers are likely to rely on robust content, such as ratings, reviews, and recommendations. Moreover, when consumers pay attention to others reviews and recommendations, learning takes place, which may become valuable and helpful in their decision making.

Research Methodology

The research design is drawn from quantitative research methodology. The survey is used to establish a baseline on the study of consuming behavior of elderly toward online shopping in Thailand. The respondents in this study must be residents of Bangkok, Thailand at the age between over 60 years old. The numbers of respondents are 250 respondents. The participants in this study are voluntary and anonymity. This study employed convenience sampling to collect data. The survey is expected to be responded by the one who has the experience with the online shopping. To establish the reliability of standardized tests, Cronbach's alpha coefficient is used to analyze all the scores on individual items, and all aspects are met at the 0.7 level. Descriptive, frequency, percentage distributions, means are used to describe and report the information collected affecting to individual variables and demographic information.

Results

A total of 250 usable questionnaires are obtained. The results show the distribution of usable responses by gender; consist of 146 males (58.4%), and 104 females (41.6%). The respondent response by age; 77 (30.8%) respondents report their age to be between 60-65; 62 (24.8%) respondents report their age to be between 66-70; 73 (29.2%) respondents report their age to be between 71-75; and 38 (15.2%) respondents reports his/her age to be over 75.

Table 1 shows the average spending for online shopping each time. 36.8% report that they spend less than 500 baht each time for online shopping; 29.6% report that they spend 501-1,000 baht each time for online shopping; 21.2% report that they spend 1,001-2,000 baht each time for online shopping; 5.6% report that they spend 2,001-3,000 baht each time for online shopping; and 6.8% report that they spend over 3,000 baht each time for online shopping.

Consumers have considered the ways of making payment for their online shopping. Credit card or debit card are ranked as the most used online shopping payment method with a rate of 45.2%. Cash on delivery is ranked as the second most used online payment method with a rate of 29.6%. E-banking / mobile banking come at next as a used online payment method with a rate of 20.8%, followed by ATM (2.8%).

The table 1 also shows the frequency online shopping. 4.8% have online shopping frequency once in three to six months; 18.8% have online shopping frequency once in three months; 24.4% have online shopping frequency once a month; 38.8% have online shopping frequency more than once in a month; 12.4% have online shopping frequency every day; and 0.8% have online shopping frequency more than once a day. Approximately 29.2% of consumers have shopped online for household supply / groceries, followed by food and beverage (27.2%), home improvement (12.8%), vitamin and supplement (9.2%), computer electronic / appliance (8.4%), apparel and accessories (8.4%), and cosmetic (4.8%).

Consumers have considered when online shopping of how and where they purchase that is comparing price (39.6%), followed by comparing sellers (25.2%), reading reviews (22.4%), and asking questions (12.8%). Most consumers find low price is the motivation for their purchasing (20.4%); 17.2% report that promotion / coupon is the second reason to online shopping; followed by convenience (16.4%); shipping and delivery (14.0%); seller's responding to questions (12.4%); recommendation (10.8%); and influencer / reviewer (8.8%).

There are a few problems that elderly customers still have to face while shopping online. Searching a product / service is ranked as the most problem found with a rate of 38%. Product quality issues are ranked as the second most problem online shopping with a rate of 26.8%. poor logistics and delivery come at next as a problem online shopping with a rate of 25.6%, followed by unclear information of product (7.6%), and hidden fee /additional charge (2%). Lastly, the overall of their satisfaction on their online shopping experience at the satisfied level with the mean of 4.23.

Table 1 Frequency Distribution of Respondents by Online Shopping Behavior

Shopping Behavior		Frequency	Percentage
Average social shopping spends each time	< 500	92	36.8
	501-1,000	74	29.6
	1,001-2,000	53	21.2
	2,001-3,000	14	5.6
	> 3,000	17	6.8
Payments	Credit card / Debit card	113	45.2
	Cash on delivery	74	29.6
	E-banking, Mobile banking	52	20.8
	ATM	7	2.8
	Others	4	1.6
Online Shopping Frequency	Once in three - six months	12	4.8
	Once in three months	47	18.8
	Once a month	61	24.4
	More than once in a month	97	38.8
	Everyday	31	12.4
	More than once a day	2	0.8
Product	Household supply / Groceries	73	29.2
	Food and beverage	68	27.2
	Home improvement	32	12.8
	Vitamin and supplement	23	9.2
	Consumer electronic/appliance	21	8.4
	Apparel and accessories	21	8.4
	Cosmetic	12	4.8
Prior to purchase	Comparing price	99	39.6
	Comparing sellers	63	25.2
	Reading reviews	56	22.4
	Asking questions	32	12.8

Table 1 (Continued)

Shopping Behavior		Frequency	Percentage
Reason to purchase	Low price	51	20.4
	Promotion / Coupon	43	17.2
	Convenience	41	16.4
	Shipping and delivery	35	14.0
	Seller's responding to questions	31	12.4
	Recommendation	27	10.8
	Influencer / Reviewer	22	8.8
Problems of online shopping	Searching a product / service	95	38.0
	Product quality issues	67	26.8
	Poor logistics and delivery	64	25.6
	Unclear information of product	19	7.6
	Hidden fee / additional charge	5	2.0

Conclusion

This study highlights the purchasing behavior online shopping of elderly in Thailand. Elderly confronts several positive and negative aspects in their online shopping. The results of this study revealed that elderly consider the online shopping and their experience to be a positive factor. The most average spending for online shopping each time is 500 baths, the payment is made by credit card or debit card. They mostly purchase product or service through online once a month for household supply and groceries. They have considered when online shopping of how and where they purchase that is comparing price and additional discount or coupon. However, they have some negative experiences while shopping online, which they have a trouble to find what they are looking for. It occurs during searching the product or service, and difficulties in finding product or service information.

According to the finding, elderly shoppers compare the product price before making purchasing decision as well as promotion or coupon for an extra discount. Additionally, they carefully ensure on the product quality especially the product with high quality and good value. If customer got a good experience with a product for the first time, they would do in trust with the retail and might be changed to the next repeat customers. The customers know more about the online products' information; it would increase the understanding and willingness for customers to shop online.

References

- Bruner, G. C., & Pomazal, R. J. (1988). Problem Recognition: The Crucial First Stage of the Consumer Decision Process. *Journal of Consumer Marketing*, 5(1), 53-63.
- Anne, D. (2021). *Never too Late: Pandemic Propels Older Shoppers Online*. Retrieved June 15, 2021, from <https://apnews.com/article/online-shopping-eases-isolation-adults-c3eec2b46e0870cf693d29606daf4f56>

- Avirutha, A. (2017). The Elements of Marketing Mix Affecting the Repurchase Electronic Marketplace (E-marketplace) in Thailand. *Proceeding of International Sripatum University Conference 2017*. 12th, 14 December 2017. p. 116- 126.
- Bellman, S., Lohse, G., & Johnson, E. (1999). Predictors of Online Buying Behavior. *Communications of the ACM*, 42(12), 32-38.
- Cui G, Lui HK, Guo X. (2012). The Effect of Online Consumer Reviews on New Product Sales. *International Journal of Electronic Commerce*. 17 (1), 39-58.
- Daly, D. J., & Kitchell, S. (1995). "Production Manager Attributes and Computer Use in Small-Sized Canadian Manufacturing Firms." *Journal of Small Business and Entrepreneurship*, 12(2), 42-59.
- Donthu, N. and Garcla, A. (1999). The Internet Shopper. *Journal of Advertising Research*, 39, 52-58.
- Fellenstein, C. & Wood, R. (1999). "Exploring E-Commerce, Global E-Business and E-Society." Prentice Hall.
- Foundation of Thai Gerontology Research and Development institute. (2021). Reporting Thai Aging People. Retrieved July 30, 2021, from <https://thaitgri.org/?p=39457>.
- Gilly, M. C. (1985). The Elderly Consumer and Adoption of Technologies. *Journal of Consumer Research*, 12 (3), 353–357.
- Hagberg, M., Sundstrom, J., & Zanden, E. (2016). "The Digitalization of Retailing: an Exploratory Framework." *Retail Distribution Management*, 44 (7), 694-712.
- Hawkins, D. I., & Mothersbaugh, D. L. (2013). *Consumer Behavior Building Marketing Strategy* (12th ed.). New York, NY: McGraw-Hill.
- Kestenbaum, R. (2017). "What Are Online Marketplaces And What Is Their Future?" Retrieved May 5, 2017, from <https://www.forbes.com/sites/richardkestenbaum/2017/04/26/what-are-online-marketplaces-and-what-is-their-future/#1b5a80503284>
- Kotler, P., & Keller, K. L. (2009). *Marketing Management* (13th ed.). Upper Saddle River, NJ: Pearson/Prentice Hall.
- Lawrence, B. (2020). *How to Optimize Online Shopping for Senior Citizens*. Retrieved June 15, 2021, from <https://inviqa.com/blog/how-optimise-online-shopping-senior-citizens>
- Meiner, N. (2021). *Impact of COVID-19 on Consumer Behaviour of Older Adults: a consumer revolution or a passing phase?* Retrieved July 30, 2021. <https://market.sec.or.th/public/ipos/IPOSGetFile.aspx?TransID=305545&TransFileSeq=52>.
- Mitzner, T. (2018). Technology Adoption by Older Adults: Findings from the PRISM Trial. *The Gerontologist*. 59 (1), 34–44.
- Morris, M. (2000). Age Differences in Technology Adoption Decisions: Implications for a Changing Work Force. *Personnel Psychology*, 53 (2), 375-403.
- National Statistics. (2020). *Internet sales as a percentage of total retail sales*. Retrieved June 15, 2021, from <https://www.ons.gov.uk/businessindustryandtrade/retailindustry/timeseries/j4mc/drsl>. Google Scholar

- Pantano, E., & Viassone, M. (2015). Engaging Consumers on New Integrated Multichannel Retail Settings: Challenges for Retailers. *Consumer Service*. 25, 106-114.
- Potkin, F. (2016). "Will Thailand's E-Commerce 'Cashless' Boom Disrupt Asia's Retail Market?" Retrieved October 15, 2016, from <https://www.forbes.com/sites/fannypotkin/2016/06/27/will-thailands-e-commerce-cashless-boom-disrupt-asias-retail-market/#3a671bb85e40>
- Powers, T., Advincula, D., Austin, M. S., Graiko, S., & Snyder, J. (2012). Digital and Social Media in the Purchase Decision Process. *Journal of Advertising Research*, 52 (4), 479-489.
- Ray, M. (2007). Needs, Motives, and Behaviors in Computer-Mediated Communication: An Inductive Exploration of Social Networking Websites. *Proceeding of The International Communication Association*. San Francisco, CA.
- Rogers, E. M. (1995). "*Diffusion of Innovations* (4th ed.)." New York: Free Press.
- Smith, C. (2018). *Senior Citizen Ecommerce Habits in 2018*. Retrieved June 15, 2021, from <https://trinity.one/insights/digital-marketing/senior-citizen-ecommerce-habits-2018/>
- Thailand Focus. (2016). "*E-commerce Rising as Gov't Proceeds with Digital Economy Policy*." Retrieved October 15, 2016, from <http://www.thailandtoday.in.th/economy/elibrary/article/805>
- The World Bank. (2016). *Thailand Economic Monitor - June 2016: Aging Society and Economy*. Retrieved July 30, 2021, from <https://www.worldbank.org/en/country/thailand/publication/thailand-economic-monitor-june-2016-aging-society-and-economy>
- Ward, M.R., & Lee, M.J. (2000). "Internet Shopping, Consumer Search and Product Branding." *Journal of Product & Brand Management*, 9 (1), 6-20
- World Economic Forum (2021). *The Pandemic Has Changed Consumer Behavior Forever - and Online Shopping Looks Set to Stay*. Retrieved June 15, 2021, from <https://www.weforum.org/agenda/2021/07/global-consumer-behaviour-trends-online-shopping/>

ENHANCING SMEs' LEADER AND BUSINESS RESILIENCE TOWARDS DIGITAL MARKETING ENGAGEMENT DURING COVID-19 PANDEMIC

Kritcha Yawised

Faculty of Business, Economics, and Communications, Naresuan university

E-mail: kritchay@nu.ac.th

Darlin Apasrawirote

Faculty of Business, Economics, and Communications, Naresuan university

E-mail: darlina@nu.ac.th

Usa Padgate

Faculty of Humanities, Naresuan University

E-mail: usaa@nu.ac.th

ABSTRACT

The purpose of this paper is to investigate the characteristics of business leaders and business resilience concerning digital marketing engagement. The sample group consisted of 25 business owners-managers of Small and Medium Enterprises (SMEs) located in the inner city of Central Business District (CBD) in Phitsanulok province. The current study found three key interlinked dimensions (themes) underpinning the concept of resilience in a business context, namely (i) '*Proactive resilience*', (ii) '*Responsive resilience*', and (iii) '*Reactive resilience*.' Specifically, three types of resilience attributes related to the characteristics of *leader and business resilience* towards digital marketing uptake in terms of strategic planning and practical activities. Leader resilience includes autodidacticism, idolism/ self- efficacy, low risk aversion, innovativeness and creativeness, and motivation, and also the characteristics of *business resilience* include a steep learning curve, observantness, adaptability, managerial and operational skills in the business process. The contribution of this research study lies in the insight it offers regarding the multifaceted approach/guidance to the adoption of digital marketing for SME owners-managers and practitioners who are in the process of making changes in their businesses during and after the COVID-19 incident.

Keywords: SMEs, leader resilience, business resilience, digital marketing, social media

1. Introduction

The Coronavirus Disease 19 (COVID-19) pandemic has had pronounced negative effects on various industrial sectors, particularly retails, wholesales and services businesses, resulting in economic recessions in many developing countries. Additionally, changes to consumer behavior and the uncertainty of scientific and

technological advances compound the unforeseen adjustments that drive many SMEs to struggle to deliver efficient services to their customers through traditional business channels. The new SME strategies, therefore, should prioritize sustainability and digitalization engagement. Despite the continuously increasing e-Commerce transactions in Thailand, Thai SMEs have not yet successfully integrated digital technologies in their business models. The lack of digital knowledge and skills makes digital adoption a challenge. Previous research studies indicate that obstacles related to Social Media (SM) platforms and technologies adoption include the lack of time and related knowledge, the lack of top management support and clear-cut practical plans, and the uncertainty of technological changes (Yawised and Apasawirote, 2021). This implies that the integration of digital technology in the marketing practices of Thai SMEs is still very patchy, and this, consequently, prevents them from fully implementing and deploying their unique characteristics to enhance their competitive advantages. Their unreadiness and risk-averse leaders have heavily blocked the adoption of such initiative. In order to enable their enterprises to take advantage of the post-pandemic rebound, more business flexibility must be encouraged, and digital marketing adopted by resilient leaders could provide a way.

SMEs, a term which accounts for nearly all of Thailand's enterprises, play a vital role in three main business sectors: service (42.1 %), manufacturing (25.3 %), and wholesale and retail (16.5 %) (OSMEP, 2020). In 2019, Thailand's SMEs accounted for 99.53 % of all enterprises, with a GDP of 16,879,027 million Thai Baht, or 41.1 % of the country's overall GDP. In 2019, 17,357,056 people were employed, with major businesses employing 5,296,687 people and small businesses employing 12,060,369 people, accounting for 69.48 % of total employment (OSMEP, 2020). According to Phitsanulok Provincial Office of the Comptroller General's Department (CGD, 2021), the COVID-19 pandemic wreaked havoc on Thailand's rural areas, notably in the lower northern provinces, resulting in economic downturns and employment losses (CGD, 2021).

However, according to Bank of Thailand (2021a) reported on the growth of e-Commerce in service, retail and wholesale sectors increase continuously along with the number of registrations in regional rural area for e-Commerce were 15,000 businesses (DBD, 2021) and e-Payment system adoption were 71,000 businesses (Bank of Thailand, 2021b). Particularly, Phitsanulok provincial which is second largest SMEs of north region (DBD, 2021), and local government also proposes a development strategic for SMEs plan in advance 20-years which is a proactive business practices to service sectors by focusing on digital marketing (OSMP, 2021). This assumes that many businesses took steps to enable them to adapt to whatever happened which one of the key starting points in new marketing era. Although prior research has developed and proposed a digital marketing conceptual framework into SMEs business, yet the research on SME's resilience of such initiative's adoption has limited (Tasic et al., 2020). Also, previous research is disconnected from theories concerning multi-level resilience where those generally less focuses on SMEs resilience for digital marketing adoption when they face with the new challenges during recession time of COVID-19 pandemic. Considering these gaps, research objectives are proposed as follows:

2. Research Objectives

- 1) To investigate resilience characteristics of SMEs' leader towards digital marketing adoption.
- 2) To investigate resilience characteristics of SMEs' context towards digital marketing adoption.

3. Literature Review

This study defines business resilience as the adaptive capability of the business process and mechanism to prepare for uncertainty derived from unexpected incidents and challenges by creating the process of acquiring new resources and capabilities (i.e. tangible and intangible capabilities) to absorb business transitions and to limit business recessions and disruptions. According to the social cognitive theory (Bandura, 1997), environmental events, personal traits, and individual behaviors interact to influence individuals' ultimate actions. Potential entrepreneurs can learn from the models of others (Bandura, 1997). Resilient businesses will not only survive a great recession but will come out of it stronger. The recipes of success for positive corporate balances are not only the results of the performance of business leaders but also the combination of the resources and capabilities of the business processes.

Leader resilience

A study conducted by De Vries and Shields (2006) points out that the characteristics of business leaders include flexibility, motivation, perseverance and optimism, and that these behavioral patterns emerge from life experiences rather than traits. Entrepreneurs who display these behaviors support not just their personal resilience but also the proclivity for their business resilience. The link between the leaders' own resilience and the resilience of their businesses is strengthened in this way (Zuperkiene et al., 2021). Previous academics assert traits of resilient business leader including self-efficacy in terms of cognitive adaptability and flexibility (Bandura, 1997). In dangerous environments, such individuals will search for knowledge, inspiration and solutions (e.g. gather information about new technologies, science, economics, trends, government policies, etc.) (Saad et al., 2021). Their passion lies not only in acquiring more knowledge but also in applying what they have observed in process designs, creating new ideas and galvanizing resources to achieve desired results. Previous academic describes such actions as creative and innovative leaders (Southwick et al., 2017). Consequently, promoting employees' creativeness and innovative output could be delivered by the business leaders in the format of business training. Additionally, business leaders who display high risk-aversion are inhibited by the adoption of new marketing technologies (Franken et al., 2014). In contrast, business leaders who display low risk-aversion are more inclined to take risks and act innovatively. They are described as bold leaders. Risk aversion tends to matter in the decision to adopt digital marketing and in the choice of a marketing technique when technology is used (Southwick et al., 2017).

SMEs resilience

There is a wealth of empirical research available concerning approaches to business resilience (Herbane, 2019). From a marketing perspective, the impact of technological capabilities on corporate sustainability management cannot be perceived effectively in a short period of time. Such implementations, therefore, should

be oriented for long-term approaches with consideration for marketing environments (Adekola & Clelland, 2020). The drivers of digital marketing in the age of digital transformation are the capacity management in response to environmental uncertainty stemming from differences in business characteristics including business contexts and marketing environments (Haarhaus and Liening, 2020). The ability to manage uncertainty requires resilience, clarity, vision, reflection and awareness as business capabilities or resources are not valuable in isolation; rather they are valuable when used to exploit opportunities. To be successful in adapting to the digital marketing domain, businesses construct their organizational structures and strategies according to their business resilience (Krings et al., 2021). In a nutshell, all such factors could be perceived as contingency factors that shape uncertainty management. This implies that the adoption and development of digital marketing could not be equally beneficial to all business sizes, sectors and contexts due to the capability constraints in their respective foundations. Resilient SMEs set themselves to expect a recession and prepare for it. In the event of the COVID-19 pandemic, such SMEs prepared to adapt to whatever situation they found themselves in—and to act decisively.

Existential challenges for the resilience linked of leaders and business

Several research studies indicate that changes due to technological advancement may be greatly influential (Farivar et al., 2021). To be truly transformative, nevertheless, the process of change must be linked to the characteristics of leadership and the involvement of stakeholders. In the context of business resilience, Ali et al. (2017) identify that the SME process involves proactive, adaptive and reactive stages. These different stages must also have different strategies related to business and leader resilience. Previous empirical studies of leader and business resilience in digital marketing have attempted to propose practical models for digital marketing transformation that encompass leaders' ability to adapt, engage and position their businesses to achieve success in the face of a rapid technological evolution (Ali et al., 2017). Some academics have proposed approaches for building the capacity of business leaders in the context of marketing transformations (Burggräf et al., 2021). Some have focused on the managerial and operational capability embedded within leaders who display high and low risk-aversion in innovation (Tasic, et al., 2020). The present study has attempted to develop a more inclusive investigation of relevant constructs concerning the resilience of leaders and SME businesses that impact the adoption of digital technologies in the marketing context.

4. Research Methodology

4.1 Research design and sample population

This qualitative study employed a thematic analysis directed by the Grounded-Theory (GT) approach and discussed conditions under relevant themes based on the framework of Theme Creation (Strauss and Corbin, 1990). Applying such principles helped provide in-depth insights into the phenomena during the COVID-19 pandemic. Using purposive sampling, 25 SMEs that already adopted SM along with digital platforms and tools (e.g. e-Payment system, social customer relationship management (SCRM) system, online community, content marketing etc.) were investigated.

4.2 Data collection

Qualitative data were collected based on semi-structured interviews conducted with 25 SME participants located in the inner city of Central Business District (CBD) in Phitsanulok province. The semi-structured interview as the research instrument was developed based on extant literatures. The data were collected from business owners or managers who were responsible for marketing and adopting digital technologies in their respective businesses (i.e. all participants were also recruited from a first round of data collection by questionnaire). One informant per firm was officially advised to complete and submit the consent form to participate in the study with the average duration of 30-40 minutes. The interviews were audio-recorded and transcribed.

4.3 Data analysis

As shown at Table 1, each interview subject was given an alphanumeric identifier which did not have any defining or qualitative value. Through the thematic analysis, the study incorporated three critical stages of coding: 'data reduction,' 'open coding' (in Grounded Theory), and 'Theme Creation.' To verify the validity and reliability of the study, academics with expertise in qualitative research studies were hired to recheck all the audio-recorded interview data verbatim and all the procedures of data analysis.

5. Research Findings

The overall characteristics of the 25 SME participants are shown in **Table1**. In general, the SMEs had at least one SM platform. Most of the participants were business owners (N = 20). Over half of the participants (80 %, N = 20) were from small-sized businesses employing no greater than 50 people, and 43 % (N = 9) operated in the industry of food and beverage. The business operating period was mostly between 1 to 3 years (N = 9). Nearly 60 % had at least two official SM sites, but almost 90 % (N = 22) did not yet fully adopt digital marketing and had no strategy for such initiative. Interestingly, the participants insisted that Marketing and IT Knowledge were predominant, as shown in Table 1.

Table 1: A sample of participant's characteristic from interviews engaging in digital marketing

Case	Position	*Size	Industrial sector	Age of Biz*	SM sites*	Strategy	Knowledge*
Case 1	Manager	1-50	Food and beverages	< 1 year	1	Informal	Marketing
Case 2	Owner	1-50	Food and beverages	< 1 year	1	Informal	IT/Marketing
Case 3	Owner	1-50	Automobiles	>10 years	2	Informal	Innovative
Case 4	Owner	1-50	Food and beverages	1-3 years	2	Informal	IT/Marketing
Case 5	Owner	1-50	Commercial	1-3 years	3	Informal	Innovative
Case 6	Owner	1-50	Appliances	1-3 years	2	Informal	Innovative
Case 7	Manager	1-50	Appliances	>10 years	2	Informal	Innovative
Case 8	Owner	1-50	Food and beverages	< 1 year	2	Informal	Marketing
Case 9	Owner	1-50	Food and beverages	< 1 year	2	Informal	Marketing
Case 10	Owner	1-50	Food and beverages	1-3 years	2	Informal	Marketing
Case 11	Owner	1-50	Commercial	1-3 years	3	Informal	Marketing
Case 12	Owner	1-50	Tourism	1-3 years	2	Informal	Marketing
Case 13	Owner	1-50	Retail	5-10 years	2	Informal	Marketing
Case 14	Owner	1-50	Retail	5-10 years	2	Informal	Marketing
Case 15	Owner	1-50	Wholesale	5-10 years	2	Informal	Marketing
Case 16	Manager	1-50	Wholesale	5-10 years	3	Informal	IT/Marketing
Case 17	Manager	1-50	Wholesale	5-10 years	3	Informal	IT/Marketing
Case 18	Owner	1-50	Food and beverages	1-3 years	3	Informal	IT
Case 19	Owner	1-50	Tourism	1-3 years	2	Informal	Innovative
Case 20	Owner	1-50	Food and beverages	1-3 years	3	Informal	Innovative
Case 21	Manager	50-99	Food and beverages	5-10 years	1	Informal	IT/Marketing
Case 22	Owner	50-99	Tourism	>10 years	3	Informal	IT/Marketing
Case 23	Owner	50-99	Commercial	>10 years	3	Formal	IT/Marketing
Case 24	Owner	50-99	Appliances	>10 years	2	Formal	IT/Marketing
Case 25	Owner	50-99	Commercial	>10 years	2	Formal	IT/Marketing

Note * Size = Number of employees, Biz = business, SM sites = Number of SM platforms, Knowledge background*

Further findings regarding the characteristics of leaders and the process of engaging with digital marketing were analyzed and synthesized by employing a thematic analysis incorporating grounded approach techniques (with subjects grouped into core categories). This led to three main themes including their own subthemes which presented the resilient characteristics of businesses and business leaders. The process of Theme Creation is shown in **Figure 1**. The three main themes related to SMEs business resilience from the 25 participants were proposed as follows: (i) **‘Proactive resilience’**, (ii) **‘Responsive resilience’**, and (iii) **‘Reactive resilience’**.

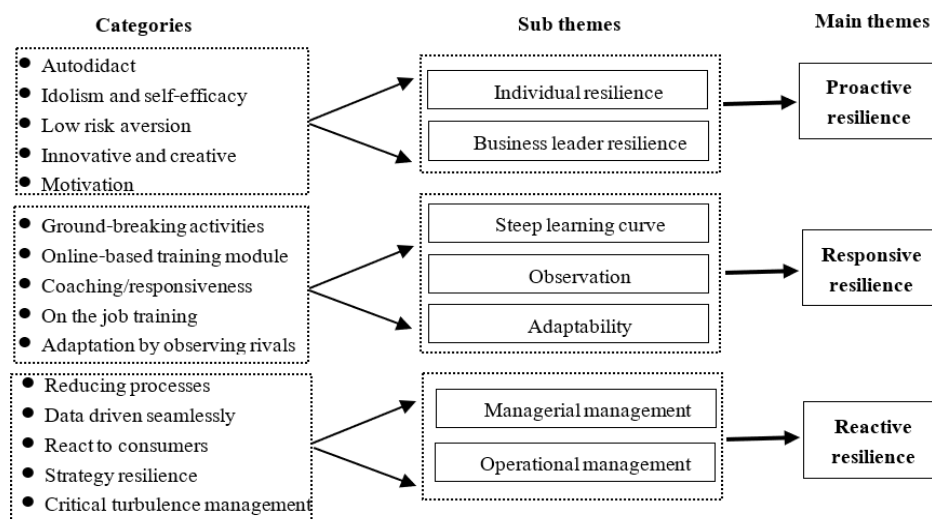


Figure 1: Three main themes and its sub-themes

According to **Figure 1**; **‘Proactive resilience’** refers to the degree to which business leaders are able to perform their characteristics and potentialities as individual and business leader. The main characteristic of such leaders including Autodidact (learning by themselves and self-taught), Idolism and self-efficacy (making staff see themselves as idol), Low risk aversion (taking high seize the opportunity), Innovative and creative (generating more choices), Motivation (encouraging and inspiring). High-performing of such characteristic leads to the advance visionary and to create their own cognitive knowledge; consequently, such leaders are making those crisis-related changes (not merely COVID-19 pandemic) with the long term in mind.

[Case 6] ...To me, it's hard time, you need to put the effort into it all kinds of thing., not only self-learning, but undertaking new.

[Case 14] ...I know it's risky and we don't have much resources and supplies. I will definitely (adopting it), if I see my payback.

[Case 24] ...inspired employees want to be and do their best and to use their skills. Let's them see you can do that ..made them believe in you at all stages.

‘Responsive resilience’ related to the degree to which adaptability strategy, vision, process of business is applied. It includes the action of Steep learning curve, (learning by doing with grounded-breaking activities), Observation (Observing rivals and marketing environment), and Adaptability (business 's rivalry-based imitation efforts). At this stage, business leaders would have ability of showing the great response to their employees to create impulsive changes and to figure out the solutions for the current and potential impediments.

[Case 13] ...We are on early stage of it; so, understand the need to master a steep learning curve and are prepared to work with new technologies. [Case 18] ...Well, we need someone working around that...and those who come up with some like ground-

breaking things. [Case 24] ...Someone can do both front and back-office processes..[xxx]..also dealing with technical platform of SM... might be IT and marketing people.

‘**Reactive resilience**’ related to the ability degree to which managerial and operational characteristic with the resilience approaches into the legacy system. This main theme aspect includes the mechanism of Reducing processes, Data driven seamlessly, React to consumers, Strategy resilience, Critical turbulence management. At this stage, specifically, the extent of technology’s differentiating role in COVID-19 crisis is stark. The role and responsibility of technology engaged by SMEs is not superficial anymore.

[Case 17] ...Yes..before invested more ..digital-related capital expenditures....strategies and processes must be revamped

[Case 23] ...make it easy for every one that system will make us different from others and stay with them [Covid-19] with real management once other occurs (crisis) you will be fine as you already got your own case [best practice, business case].

6. Discussion

Based on the qualitative analysis findings, the discussion will be shaped on the digital marketing adoption context which is based on the research objectives as follows.

1. What are resilience characteristics of SMEs’ leader towards digital marketing adoption?

This findings confirmed that the characteristics of resilient business leaders included *autodidacticism, idolism/self-efficacy, low risk-aversion, innovativeness and creativeness and motivation*. These were the five predominant factors driving SME resilience during turbulent times such as the COVID-19 pandemic.

In digital marketing uptakes, for example, digital value propositions must be articulated by business leaders. This value proposition must reconsider how digital technology and information might be used to augment the business’s existing marketing programs and assets as well as to increase competencies in order to generate additional customer value. Such characteristics lead to a business transformation that could provide a valuable opportunity for the core business. This is called “**Proactive resilience**” where cutting-edge technologies and new approaches are adopted. By so doing, individuals (e.g. business owners) will acquire specific and new knowledge to extend their marketing legacy system in an appropriate way aligned with their decision-making process to identify a range of potential options. In the next stage, the characteristics of resilient individuals and business leaders play a vital role in creating alternatives for complex decisions using techniques of brainstorming to generate options. Specifically, the emergence of digitalization relationship leads to a variety of relationships among businesses and their actors from upstream to downstream levels including (i) sustainable activities-linked center marketing, (ii) new resources-linked center collaboration, (iii) digital ecosystem-linked inter-firm relationship, and (iv) digital engagement process-linked prospects. Such capabilities influence business strategy direction and play a greater role in enhancing business performance in both tangible and intangible dimensions. This corresponds with previous studies indicating that adopting new technologies in marketing must be initiated by business owners who are highly creative and innovative and skilled in marketing and IT (Franken et al., 2014, Yawised et al., 2018).

2. What are resilience characteristics of SMEs’ context towards digital marketing adoption?

The findings suggested that the SMEs typically adapted their operations by imitating and observing their rivals or successful businesses that were already making use of digital marketing. Compared to non-resilient businesses, resilient businesses tend to reinforce their learning process to upgrade specific skills of their staff; for example, filling up the staff’s technology ability talent gaps during a crisis, rather than rotating or laying off staff.

To accelerate the training process, the approach of on-the-job training is applied using online simulation, peer-coaching, experimenting with new technologies, assigning specific tasks (problem solving), and generating an optimal sequence of actions to achieve optimal outcomes. Such digital transformations will impact businesses which are involved in tackling societal challenges. This, in turn, will lead to sustainability and innovative operational changes in the marketing ecosystem through a smart integration of digital technologies, processes and competencies across all levels and functions in a staged and strategic way. This study suggests that a related imperative for success is having a culture that encourages experimentation and acting early. This stage is called **“Responsive resilience.”** This suggestion corresponds with the observation made by Krings et al., (2021) that SMEs that adopt new technologies will have the ability to fill the marketing gaps in times of crisis and to progress further than their competitors in the use of digital technologies in both pre and post pandemic periods.

Additionally, further findings affirmed that although the SMEs tended to be cautious about adopting unfamiliar new technologies, integrating digital technologies to optimize process-based operations was less expensive from the outset and could reduce expenditures on ineffective campaigns. At an early stage, the SMEs began the process of an in-house digital marketing implementation by analyzing the SM activities of business rivals in their industrial sectors and then by imitating and adapting to fit their own business contexts. For example, to cope with the reactions of customers during the COVID-19 situations, advanced personalization capabilities were displayed by SMEs such as regular changes in their campaigns, offers and recommendations to boost their business revenues and client satisfaction. In addition, expenses were reduced and customer satisfaction was improved by optimizing routing, logistics network designs, and warehouse operations. To reduce costs, ensure on-time delivery and provide highly relevant information and services, knowing individuals' behaviors was necessary. As a result, online community groups were formed with specific purposes for particular events. Additionally, the digital ecosystem included electronic payment (e-Payment) for financial transactions. The businesses made an effort to embed the e-Payment system in their official online commerce channels and websites. All such movement is called **“Reactive resilience”** stage. This corresponds with a recent study conducted by Schiavone et al. (2021) which indicates that in a digital era the relationship capabilities include the business ecosystem, culture, inter-firm relationships, adaptability and flexibility embedded in the experiences of actors and customers from their interactions and communications through channels provided for the stakeholders. The present study recommends that increased staff autonomy and more decentralized decision-making processes, associated with more Team-Based Learning (TBL) styles, will result in solutions that show more advanced stages of digital marketing adoption. In fact, business leaders must consider ‘what resources/capabilities they should have’ and ‘what resources/capabilities they already have and do not have,’ and ‘how to reconcile existing resources and capabilities to the change of digital environment.’ All of these require a visionary competence and other supplementary elements for long-term development of digital strategic planning.

Based on above discussion, a resilient leader is a person who have ability to maintain their energy level and retain a positive attitude with a strong sense of opportunity under pressure to cope with uncertainty and disruptive changes. Such abilities create potential of sustainable and proactive learning. Thus, it supposes that the greater leader resilience, the greater its proactive and responsive resilience. Meanwhile, a resilient business is more likely to have the capability to create transformation activities with a specific situation and/or degree to which business practices can sense and respond quickly to the change. It focused on the integration of new business process into legacy system with agility process. SMEs need to adapt and routinized their resources to

focus on proactive methodologies to reduce a complexity of business process. Thus, it assumes that the greater business resilience, the greater its responsive and reactive resilience also.

7. Sugestion

Managerial implications

This study has some limitations. This study is based on exploratory investigation which does not permit the generalisation of results, and further empirical evidence is required. This research represents an initial step towards the development of a more exhaustive understanding of how the relationship between SMEs leaders and their business context engaging in digital marketing practice which they operate can positively or negatively affect the resilience of SME. As a qualitative analysis, the interpretation of the findings were made to determine the probable conclusions of the sample group, and would not accommodate a replication with a larger population. Thus, future studies are recommended to examine and confirm the proposed variables using empirical hypothesis testing based on quantitative methods to yield more generalized results. The future research may focus on the traits of different industrial sector that may affect the results of different types of resilience. Also, future longitudinal studies on in-depth comparisons of the impact of digital marketing adoption on business performances would also yield useful insights that could enhance an understanding of digital marketing engagement in terms of strategic planning, practices, processes, monitoring and measurement.

8. References

- Ali, I., Nagalingam, S., & Gurd, B. (2017). Building resilience in SMEs of perishable product supply chains: enablers, barriers and risks. *Production Planning & Control*, 28(15), 1236-1250.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY, US: W H Freeman/Times Books/ Henry Holt & Co.
- Bank of Thailand. (2021a). *Get to know B2C e-Commerce: Business models, payment patterns, and market monitoring methods, 2021*, from [https://www.bot.or.th/Thai/Statistics/Articles/Doc_Lib_statistics Horizon/StatHorizon_B2C_eCommerce.pdf](https://www.bot.or.th/Thai/Statistics/Articles/Doc_Lib_statistics_Horizon/StatHorizon_B2C_eCommerce.pdf)
- Bank of Thailand. (2021b). *Payment Systems Roadmap No.4 (2019-2021)*, from https://www.bot.or.th/English/PaymentSystems/PolicyPS/Documents/PaymentRoadmap_2021.pdf
- Burggräf, P., Dannapfel, M., Adlon, T., & Kasalo, M. (2021). Adaptivity and adaptability as design parameters of cognitive worker assistance for enabling agile assembly systems. *Procedia CIRP*, 97, 224-229.
- CGD. (2021). Economical Report of Phitsanulok province *PLK CDG Evaluation Phitsanulok Economics in 2021*: Phitsanulok provincial office of the comptroller general department (CGD), <http://online.anyflip.com/kevcd/fazy/mobile/index.html>.
- DBD. (2021). *Provincial business information Bangkok: Department of business Development*. https://www.dbd.go.th/more_news.php?cid=1459

- De Vries, H., & Shields, M. (2006). Towards a theory of entrepreneurial resilience: a case study analysis of SME owner operators. *New Zealand Journal of Applied Business Research (NZJABR)*, 5(1), 33-43.
- Farivar, S., Wang, F., & Yuan, Y. (2021). Opinion leadership vs. para-social relationship: Key factors in influencer marketing. *Journal of Retailing and Consumer Services*, 59, 102371.
- Franken, J. R. V., Pennings, J. M. E., & Garcia, P. (2014). Measuring the effect of risk attitude on marketing behavior. *Agricultural Economics*, 45(5), 525-535.
- Haarhaus, T., & Liening, A. (2020). Building dynamic capabilities to cope with environmental uncertainty: The role of strategic foresight. *Technological Forecasting and Social Change*, 155, 120033.
- Herbane, B. (2019). Rethinking organizational resilience and strategic renewal in SMEs. *Entrepreneurship & Regional Development*, 31(5-6), 476-495.
- Krings, W., Palmer, R., & Inversini, A. (2021). Industrial marketing management digital media optimization for B2B marketing. *Industrial Marketing Management*, 93, 174-186.
- OSMEP. (2020). *Executive Summary: MSME 2020 new normal brings opportunities*, from https://www.sme.go.th/upload/mod_download/download-20200824164517.pdf
- OSMP. (2021). *Phitsanulok Master Plan: B.E. 2563 – 2582 (2020 - 2039)*, from <https://www.opsmoac.go.th/phitsanulok-strategic-files-421191791803>
- Saad, H., Hagelaar, G., van der Velde, G., & Omta, F. (2021). Conceptualization of SMEs' business resilience: A systematic literature review. *Cogent Business & Management*, 8(1): 1-33.
- Schiavone, F., Mancini, D., Leone, D., & Lavorato, D. (2021). Digital business models and ridesharing for value co-creation in healthcare: A multi-stakeholder ecosystem analysis. *Technological Forecasting and Social Change*, 166, 120647.
- Southwick, F. S., Martini, B. L., Charney, D. S., & Southwick, S. M. (2017). Leadership and Resilience. In J. Marques, & S. Dhiman (Eds.), *Leadership Today: Practices for Personal and Professional Performance*, 315-333. Cham: Springer International Publishing.
- Strauss, A., & Corbin, J. M. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Thousand Oaks, CA, US: Sage Publications, Inc.
- Tasic, J., Amir, S., Tan, J., & Khader, M. (2020). A multilevel framework to enhance organizational resilience. *Journal of Risk Research*, 23(6), 713-738.
- Yawised, K., & Apasawirote, D. (2021). Social media overcoming impediments for successful strategy formulation by small and medium enterprises (SMEs). *The 8th Business Economics and Communications International Conferences*, 126-135.
- Zuperkiene, E., Simanskiene, L., Labanauskaite, D., Melnikova, J., Davidaviciene, V. (2021). The COVID-19 pandemic and resilience of SME's in Lithuania, *Entrepreneurship and Sustainability Issues*, 8 (3), 53-65.

**ANTECEDENTS AND CONSEQUENCES OF eWOM, UTILITARIAN AND
HEDONIC MOTIVATIONS TOWARD SIP SHOP'S ONLINE PURCHASE
INTENTION IN BANGKOK, THAILAND**

Mr. Anuj Krishna Shrestha

School of Interdisciplinary Technology and Innovation, Sripatum University

E-mail: anuj.sh@spu.ac.th

Ms. Ketsarin Puangrat

Student ID: 61043605

School of Interdisciplinary Technology and Innovation, Sripatum University

E-mail: karakaraked@gmail.com

Mrs. Warunee Buasri

School of Interdisciplinary Technology and Innovation, Sripatum University

E-mail: warunee.bu@spu.ac.th

ABSTRACT

There is evidence that shopping in-store for groceries and household goods is a part of Thai life, as we could see from the expansion of modern-trade stores throughout the country. Whereas, Covid-19 pandemic restrictions resulted in a disruption in the buying pattern of consumers and unfavorably affected the country's economy. Uncertain situations as such propel the economy to sustain itself based on promoting products manufactured in Thailand, which plays a vital role in the GDP and helps in the revival of the economy. With comprehension, the faculty of Interdisciplinary Technology and Innovation at Sripatum University in Bangkok initiated a social platform; SIP Shop, to sell Thai manufactured goods mobilizing 25 faculty students as interns distributed into 4 departments naming, Accounting, Admin & Sales, Creative & Designing, and Marketing. The platform ergonomically focused on educating the trainees and initiating to gradually sustain the economy by adding value to a few communities with the help of selling their community products through the faculty's online platform. Thereby, this paper aims to understand consumer buying behavior by studying the antecedents and consequences of electronic Word of Mouth, Utilitarian and Hedonic Motivations toward their Purchase Intention in Bangkok, Thailand. A total of 92 respondents were surveyed in order to measure their online purchase intention. To accomplish the objectives, the researchers used both simple and multiple linear regression methods, and structural equation model for data analysis. It was observed that hedonic motivation is highly significant and had a more positive impact than electronic word of mouth towards the online purchasing attitude. Moreover, SIP Shop's trust and entertainment was found to be a highly contributing factor affecting purchase intention.

Keywords: eWOM, Utilitarian Motivation, Hedonic Motivation

1. Introduction

SIP Shop is an online-based business simulation project undertaken by the faculty of Interdisciplinary Technology and Innovation, Sripatum University established on 1 June 2021. As the abbreviation ‘SIP’ connotes; S = Sustainable, I = Idea, P = Products, the project was initiated with the aim to help support and add value to communities that got affected due to a unique challenge; the COVID-19 pandemic. Concurrently, the project was designed to underpin the foundation of the online-based platform, ‘SIP Shop’, recruiting and educating students who were not able to train outside for Summer Internship 2021. The participating students were allocated to 4 departments upon their interests specified as, Accounting, Admin and Sales, Creative & Designing, and Marketing. The very project gave a practical exposure to the students with a bird’s eye view of their particular field of interest. They were selling various items through their online-based platform ranging from confectionery to cosmetics manufactured in Thai communities.

According to Bangkok Post (2021), the eCommerce industry drew a tremendous increase in terms of new customer acquisition at around 50% for 2020 compared to the previous year. Likewise, Online shopping in Thailand registered a growth of 40% in uses after 2020 lockdowns compared with the pre-COVID numbers (Google:2020, Temasek:2020). This study, thereby, focuses on exploring the SIP Shop’s online purchase intention during the pandemic.

In this context, the researchers disseminated a questionnaire to the SIP Shop page followers, receiving a total of 92 responses. The research gathered 6 constructs; customer convenience, customer selection, trust, customer engagement, customer interaction, utilitarian motivation, e-word of mouth, hedonic value, customer attitude, and purchase intention.

2. Research Objective

The objective of this research is to identify the antecedents and consequences of Utilitarian Motivation, e-Word of Mouth, and Hedonic Motivation toward SIP Shop’s online Purchase Intention in Bangkok, Thailand. The study will emphasize Utilitarian Motivation, e-Word of Mouth, and Hedonic Motivation.

- (1) To evaluate the influence of Selection and Convenience towards Utilitarian Motivation.
- (2) To analyze the influence of Entertainment and Interaction on Hedonic Motivation.
- (3) To find the influence of Trust on e-Word of Mouth.
- (4) To test the influence of Utilitarian Motivation, e- Word of Mouth, and Hedonic Motivation on Attitude towards Online Shopping.
- (5) To evaluate the influence of Selection, Convenience, Entertainment, Interaction, Trust, Utilitarian, Hedonic, WOM, and Attitude toward on Purchase Intention.
- (6) To examine if e-WOM, Utilitarian Value and Hedonic Motivation influence Purchase Intention through Attitude.
- (7) To determine if Utilitarian Value mediates through Selection and Convenience to influence Purchase Intention.

(8) To examine if Hedonic mediates through Entertainment and Interaction to impact on Purchase Intention.

(9) To test if Trust Influences Purchase Intention via e-WOM.

3. Literature Review

3.1 Theory, Concept, and Related Research

The researchers analyzed the theoretical frameworks from previous studies to construct a conceptual framework. In order to elucidate the conceptual framework, the researchers drew 3 major factors from the theoretical framework to study the antecedents and consequences of those factors in terms of SIP Shop online shopping. The 3 major factors are outlined as customers' Utilitarian Motivation, Hedonic Motivation, and e-Word of Mouth.

Literature in marketing asserts that utilitarian and hedonic motivations are eminent consumption values that define consumer behavior and consumer decision-making on purchase (Redda, 2020). Babin and Harris (2016) stressed the most favorable motivation typology can be obtained mostly by utilitarian and hedonic motivation propositions. Correspondingly, Batra and Ahtola (1991) posited that utilitarian motivation drives by the functional motivation or value of any object. And, hedonic consumption motivation comes from the emotional or sensory experience of online shopping. To comprehend, a study construed that utilitarian motivation is an antecedent of consumer intention to search and purchase over the internet. Also, the study figured the hedonic consumption motivation has a direct effect on consumer intention to search (To et al., 2017). Thereby, consumers are increasingly turning to social networks for information search also known as electronic word of mouth. Chu and Kim (2011) interpreted that a social network is a platform enabling users to exchange opinions and experiences about products/ services with their friends and acquaintances. The new generation of smart devices has enabled consumers to play a vital role in creating, generating, and distributing electronic word of mouth (Berthon et al., 2008).

Based on the 3 major evolving factors, the researchers drew both antecedent and consequential factors from the previous studies. The researchers designed the conceptual framework based on five research models. The first model was developed by Yu et al., (2018) in "Analysis of Consumers' Purchase and Shopping Well-being in Online Shopping Carnivals with Two Motivational Dimensions". The study showcased that selection and convenience exerted a positive effect on utilitarian shopping motivation. In addition, the study implied that convenience is the most effective factor in increasing utilitarian motivation. Moreover, the study demonstrated that interaction and entertainment construct positive effects on hedonic shopping motivation.

The second model was developed by Vlachos *et al.*, (2011) in "Too much of a good thing: Curvilinear effects in the evaluation of services and the mediating role of trust ". The results corroborated that consumer trust has a positive effect on word of mouth.

The third research model was developed by Abedi *et al.*, (2019), in an article titled “Influence of eWOM information on consumers’ behavioral intentions in mobile social networks” Its findings indicate that electronic word of mouth information usefulness has positive effects on creating a positive attitude towards the electronic word of mouth information. Additionally, the fourth research model was developed by Redda (2018), in a journal titled “The influence of utilitarian and hedonic consumption values on Consumer Attitude towards Online Shopping and Purchasing Intention”. Its results illustrated that utilitarian shopping motivations have a positive impact on consumers’ attitudes towards online shopping. And, there is a statistically significant relationship of hedonic motivation on consumer attitude towards online shopping.

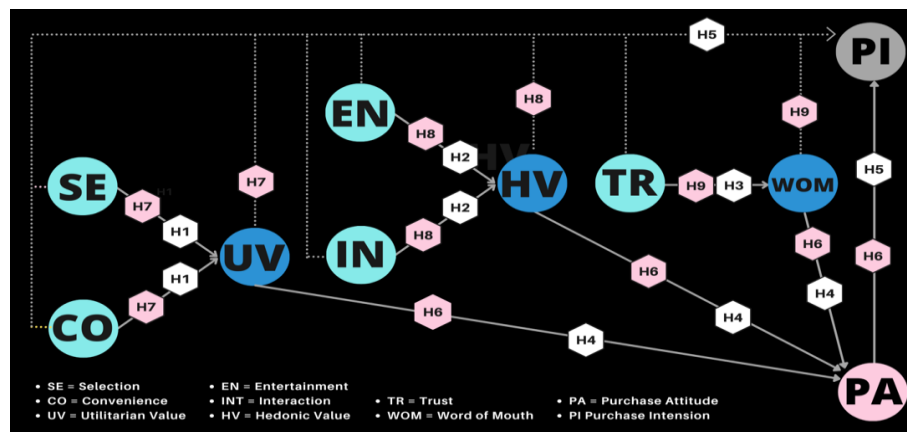


Figure 3.1 Conceptual Framework

Ultimately, the fifth research was developed by Rahman *et al.*, (2018) in an article titled “Motivations and barriers to purchasing online: understanding consumer responses”. The results displayed that attitude towards online shopping has a significant relation with online purchase intention.

3.2 Research Framework

The objective of this research is to study the antecedents and consequences of e-word of mouth, utilitarian and hedonic motivations toward purchase intention of SIP Shop in Bangkok, Thailand. The factors drawn to study are selection, convenience, entertainment, interaction, trust, and attitude toward the SIP Shop platform. The researcher customized the conceptual framework as shown in Figure 3.1

3.3 Research Hypotheses

Based on the conceptual framework, five hypotheses were formed to indicate the association between independent and dependent variables. Each hypothesis was tested to verify the possible significance.

H1: Selection and Convenience influence Utilitarian Motivation.

H2: Entertainment and Interaction influence Hedonic Motivation.

H3: Trust influences e-Word of Mouth.

H4: Utilitarian Motivation, e-Word of Mouth, and Hedonic Motivation influence Attitude towards online shopping.

H5: Selection, Convenience, Utilitarian, Entertainment, Interaction, Hedonic Value, Trust, e-Word of Mouth, and Attitude towards online shopping influences Purchase Intention.

H6: e-Word of Mouth, Utilitarian and Hedonic Value influence Purchase Intention through Purchase Attitude.

H7: Selection and Convenience influences Purchase Intention through Utilitarian Value.

H8: Entertainment and Interaction influences Purchase Intention through Hedonic Value.

H9: Trust influences Purchase Intention through e-Word of Mouth.

4. Research Methodology

4.1 Research Design

The main objective of the research was to study the antecedents and consequences of e-word of mouth, utilitarian motivation, and hedonic motivation towards SIP Shop's online purchase intention. The study implemented descriptive analysis to discern the characteristics of the population. Robson (2002) defined descriptive research as the study carried out for depicting an accurate profile of persons, events, or situations. Moreover, the researchers additionally employed a survey method to gather facts about the target population. A survey is the research approach that generates a questionnaire to acquire information on facts, opinions, and attitudes of the respondents in terms of inexpensive, quick, efficient, and accurate means (McDaniel, 2000). Accordingly, the questionnaire was created from the previous studies that were utilized to develop the conceptual framework of this study. The questionnaire was designed in Google Form and dispatched it to SIP Shop page followers and customers through various social media accounts. And, the survey was conducted in both Thai and English language for respondent convenience.

4.2 Population and Sample

The main population in this research was the SIP Shop's social media handle followers and customers. Based on the managerial judgment, the researchers decided the size of the sample depending on the previous studies. Conclusively, the use of sample sizes similar to those used in the prior studies equips the amateur researcher with a comparison with other researchers' judgments (Babin *et. al.*, 2013). The researchers, thereby, consolidated 5 supporting previous studies to determine the sample size.

4.3 Research Instrument

The researchers utilized a research instrument dispatching questionnaire to collect primary data from the target population. The questionnaire was distributed to analyze the antecedents and consequences of e-word of mouth, utilitarian, and hedonic motivations towards the purchase intention of the respondents.

4.4 Data Collection

The respondents of this research include both male and female gender who follow SIP Shop online page or have purchased at SIP Shop online platform. A total of 92 responses were collected from the individuals in Bangkok. The researchers divided the questionnaire into 4 parts; screening, independent variables, dependent variables, and demographic factors to assure clarity. In order to analyze the screening question, the researchers

applied the simple category method. The independent and dependent variable questions were drawn from the previous studies in the form of a five-point Likert scale method. The scale defined different numbers presenting different respondent opinion levels; 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The respondents were asked about general points such as gender, age, education status, and career for covering demographic questions.

4.5 Data Analysis

The researchers coded the filled-out questionnaires (n=92) with the implication of statistical software after accumulating the required data. Vanishbancha (2007) defined the very software as a particular solution for applications with a fully integrated survey analysis system. The researchers applied Simple Linear Regression and Multiple Linear Regression for inferential analysis. The whole procedure was conducted using the Statistical software. In addition, Structural Equation Model assessment analysis was applied to analyze the hypothesized relationships to empirically confirm them.

5. Research Findings

The researchers carried out descriptive statistics to analyze the demographic characteristics of the respondents who follow the SIP Shop online page or have purchased at SIP Shop in Bangkok, Thailand. Likewise, for applicable demographic characteristics, the researchers used gender, age, education, and career. The highest frequency and percentage of the analysis obtained by collecting 92 valid samples are shown in Table 1. Likewise, Table 2 represents the summary of result hypotheses. Furthermore, Table 3 and 4 constitute the results of hypotheses based on Structural Equation Model.

Table 1: Demographic Participant

Demographic Factors	Characteristics	Frequencies (f)	Percentage %
Gender	Female	71	77.2%
Age	19-30 Years	84	91.3%
Education	Bachelor's Degree	86	93.5%
Career	Student	70	76.1%

Table 2: The summary of results hypotheses analysis, using simple and multiple linear regression

Model Summary						
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	a.Predictors: (Constant), SE, CO	.806 ^a	.649	.641	.41373	
1	a.Predictors: (Constant), IN, EN	.893 ^a	.797	.792	.32697	
1	a.Predictors: (Constant), TR.	.700 ^a	.490	.484	.49294	
1	a. Predictors: (Constant), HV, WOM, UV	.843 ^a	.711	.701	.37592	
1	a. Predictors: (Constant), SE, CO, UV, EN, IN, HV, TR, WOM, PA	.878	.770	.745	.32569	
ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.167	2	14.083	82.276	.000 ^b
	Residual	15.234	89	.171		
	Total	43.401	91			
a. Predictors: (Constant), CO, SE b. Dependent Variable: UV.						
1	Regression	37.360	2	18.680	174.727	.000 ^b
	Residual	9.515	89	.107		
	Total	46.874	91			
a. Predictors: (Constant), IN, EN b. Dependent Variable: HV.						
1	Regression	20.985	1	20.985	86.362	.000 ^b
	Residual	21.869	90	.243		
	Total	42.854	91			
a. Predictors: (Constant), TR						
b. Dependent Variable: WOM						
1	Regression	30.641	3	10.214	72.276	.000 ^b
	Residual	12.435	88	.141		
	Total	43.076	91			

Table 2: (Continued)

Model		Sum of Squares	df	Mean Square	F	Sig.
a. Predictors: (Constant), HV, WOM, UV.						
b. Dependent Variable: PA						
1	Regression	29.131	9	3.237	30.514	.000 ^b
	Residual	8.698	82	.106		
	Total	37.830	91			
a. Predictors: (Constant), SE, CO, UV, EN, IN, HV, TR, WOM, PA						
b. Dependent Variable: PI.						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.006	.304		.020	.984
	SE	.895	.084	.410	10.659	.000
	CO	.522	.086	.485	6.068	.000
a. Dependent Variable: UV						
1	(Constant)	-.123	.216		-.570	.570
	EN	.775	.068	.738	11.315	.000
	IN	.228	.072	.208	3.191	.002
a. Dependent Variable: HV						
1	(Constant)	1.254	.286		4.379	.000
	TR	.652	.070	.700	9.293	.000
a. Dependent Variable: WOM						
1	(Constant)	.537	.242		2.223	.029
	WOM	.331	.088	.330	3.759	.000
	UV	.157	.106	.158	1.480	.142
	HV	.413	.101	.431	4.081	.000

Table 2: (Continued)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
a. Dependent Variable: PA						
1	(Constant)	.432	.247		1.748	.084
	SE	-.094	.093	-.089	-1.017	.312
	CO	-.066	.098	-.066	-.674	.502
	UV	-.015	.118	-.016	-.128	.898
	EN	.377	.099	.382	3.799	.000
	INT	.065	.079	.074	.825	.412
	HV	.183	.092	.195	1.990	.050
	TR	.380	.101	.407	3.754	.000
	WOM	.044	.119	.049	.368	.714
	PA	.009	.110	.010	.085	.933
a. Dependent Variable: PI						

Table 3: The summary of direct, indirect and total effect derived from Structural Equation Model

Endogenous V.	Exogenous V.	Direct Effect	Indirect Effect	Total Effect
PI	UV	.610	.180	.794
	HV	.155	.075	.230
	WOM	.45	.127	.577
Endogenous V.	Exogenous V.	Direct Effect	Indirect Effect	Total Effect
PI	SE	.020	.025	.450
	CO	-.200	.298	.278
Endogenous V.	Exogenous V.	Direct Effect	Indirect Effect	Total Effect
PI	EN	.110	.111	.221
	IN	.570	.031	.601
Endogenous V.	Exogenous V.	Direct Effect	Indirect Effect	Total Effect
PI	TR	.280	.315	.595

Table 4: The summary of hypotheses analysis, using Structural Equation Model

	Total Effect	Indirect Effect	Direct Effect	Result
SE → PI	.016	.004	.986	Full mediation
CO → PI	.009	.018	.000	Partial mediation
EN → PI	.034	.181	.584	Direct
IN → PI	.012	.148	.020	Direct
T → PI	.014	.009	.050	Partial mediation
WOM → PI	.007	.121	.009	Direct
UV → PI	.016	.113	.015	Direct
HV → PI	.226	.535	.441	No relation

6. Discussion

This section presents the key findings of the data analysis. Based on the descriptive analysis of the demographic factors gathered from the survey, 77.2% of the respondents were females, most of them were between 19-30 years old. 76.1% of the respondents' current status were students. And, 93.5% of respondents are pursuing or have completed bachelor's degrees. From the comprehensive analysis, the researchers could assume that most of the students are frequent SIP Shop page visitors. In the perception of SIP Shop administrators, they shall direct themselves towards this particular group focusing on trying to understand the needs of these target groups in terms of convenience, product selection, entertainment, and interaction to create utilitarian and hedonic motivation. It is certain that during the lockdown period, students have a high potential to engage with social networking handles. All in all, they could be easily targeted using effective marketing strategies through internet marketing. Although the percentage of the higher age group was found to be low, SIP shop administrators must keep track of the persona profile to not lose the existing customers.

The results of hypothesis one (H1) implied that customer convenience and customer selection positively influence utilitarian motivation in terms of the SIP Shop online platform. In Table 2, the output of the Model Summary inferred that the correlation coefficient (R) is equal to .806 having strong statistical significance influencing customer utilitarian motivation. In addition, the coefficient of determination is equal to .641 referring to customer utilitarian motivation to increase or decrease by 64.1%. Moreover, the result of the ANOVA (Analysis of Variance) table displayed that the significance is equal to .000, interpreting that customer convenience and selection remarkably influence utilitarian motivation.

Hypothesis two results stated that the correlation coefficient (R) is equal to .893 forming strong statistical significance influencing customer interaction and entertainment towards hedonic motivation. Also, the coefficient of determination is equal to .792 stating hedonic motivation to increase or decrease by 79.2%. In addition, the result from the ANOVA table indicated that the significance level is equal to .000, construing that customer interaction and entertainment together significantly influence customer hedonic motivation towards SIP Shop online service platform.

In addition, referring to outputs of hypothesis three (H3) showcased that the correlation coefficient is .700 expressing strong statistical significance on influencing e-word of mouth. The results also demonstrated that the correlation of determination is .484 denoting e-word of mouth to increase or decrease by 48.4%. The beta value .700 represents that trust positively influences e-word of mouth.

Based on the findings of Hypothesis four (H4), the correlation coefficient is .843 asserting that independent variables hedonic motivation, e-word of mouth, and utilitarian motivation notably influence attitude towards purchasing at SIP Shop. In addition, the ANOVA table presented the significance of .000 as utilitarian motivation, e-word of mouth, and hedonic motivation measurably affecting attitude towards online shopping at SIP Shop. Whereas, it is studied that the only utilitarian motivation separated has no statistically significant impact on the purchase attitude showcasing a p-value of .142.

Results obtained by hypothesis five (H5) output of the model summary indicated that the correlation coefficient (R) is equal to .878 inferring high quality of prediction for purchase intention. The Anova table shows that statistical significance between the selection, convenience, utilitarian value, entertainment, interaction, hedonic value, trust, word of mouth, and attitude and purchase intention. Furthermore, the coefficient of determination is equal to .745 indicating a 74.5% rise or reduction in purchase intention. And, only trust and entertainment are significantly contributing to purchase intention.

According to the findings of hypothesis six from tables 3 and 4, it turned out that both e-word of mouth and utilitarian value, have a significantly greater direct impact on purchase intention. The standardized effect of the structural equation model revealed that utilitarian value has the greatest influence on purchase intention followed by word of mouth and hedonic value.

The outcome of hypothesis seven, as illustrated in figure 6.1, implied that both selection and convenience have a greater effect on purchase intention via utilitarian. And, as shown in table 4, selection fully mediates purchase intention via utilitarian motivation, whereas, convenience partially mediates purchase intention via utilitarian motivation.

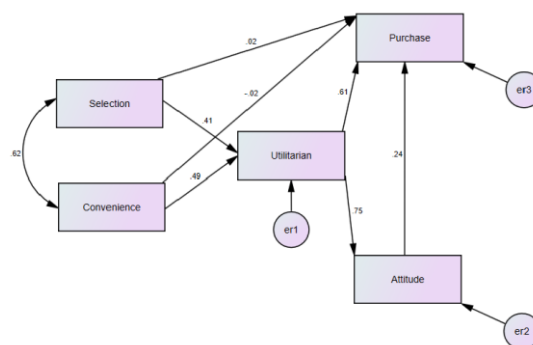


Figure 6.1: Structural Equation Model

According to figure 6.2, hypothesis eight finding exhibits that entertainment and interaction directly impact purchase intention. It is also observed from table 4 that entertainment and interaction has a direct relation with purchase intention.

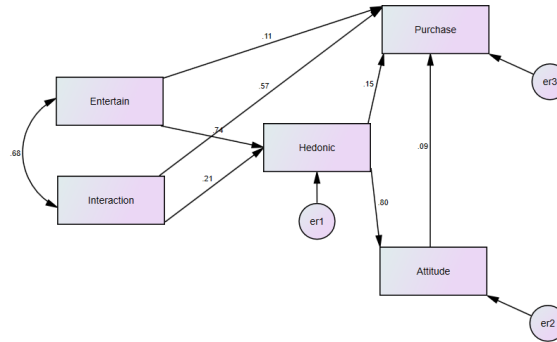


Figure 6.2: Structural Equation Model

In accordance with hypothesis nine result illustrated in figure 6.3, e-word of mouth mediates trust to highly influence purchase intention. Following that, table 4 showcases that trust is a partial mediating factor to obtain purchase intention.

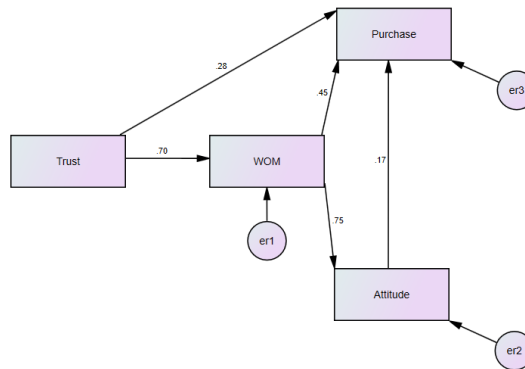


Figure 6.3: Structural Equation Model

7. Suggestion

According to Statista (2021), online retails and convenience stores are seen to boom due to the restrictions of the pandemic enabling consumer convenience of less travel. Fortunately, many Thais are found purchasing organic and local products. SIP Shop administrators must take this as a competitive advantage to sell local products from their socially sustainable point of view.

Depending on the data interpretation, SIP Shop administrators should offer convenience with the use of a one-stop service platform where customers can select various products, interact, engage and spread the word to achieve positive utilitarian motivation and purchase intention. They should also add new product lines that suit the persona profile from the output of data. Besides, the administrators must engage on trending platforms like Tiktok to entertain their customers as the output of Entertainment has a higher Beta value than Interaction towards purchase intention showcasing direct relation. Likewise, the administrators should also post choice contents that could indirectly interact to help support collecting customer feedback at all times. In order to gain trust, the administrators should share reviews and their student status as posts to exhibit their lifestyle which would

definitely lead to positive e-word of mouth. Furthermore, the administrators should utilize storytelling for each of the products to attain a positive attitude and purchase intention.

8. Acknowledgement

We would like to sincerely reflect on those who have encouraged us to provide the opportunity to embark throughout an intensive period of this paper.

First off, we would like to acknowledge our gratitude to Asst. Prof. Dr. Sirinthorn Sinjindawong for her guidance on the establishment of the SIP Shop online platform and her continued support and expertise towards this particular research. Her immense knowledge and suggestions were invaluable in the pursuit of the completion of this paper. And, we would like to extend our appreciation to the SIP Shop page followers who spared their time and experience as per the questionnaire requirements.

9. References

- Abedi and others (2019). "Influence of eWOM information on consumers' behavioral intentions in mobile social networks". *Journal of Advances in Management Research*, 17 (1), 2020, pp. 84-109.
- Babin and others (2013). "Business research methods". 9th Edition. USA: South Western, Cengage Learning.
- Babin and others (2016). "Consumer behaviour". Mason, OH: South-Western Cengage Learning
- Batra and others (1991). "Measuring the hedonic and utilitarian sources of consumer attitudes". *Marketing Letters*, 2 (2), pp. 159-170.
- Berthon and others (2008), "Ad lib: when customers create the ad", *California Management Review*, 50 (4), pp. 6-30.
- Chu and others (2011), "Determinants of consumer engagement in electronic word-of-mouth (eWOM) in social networking sites", *International Journal of Advertising*, 30 (1), pp. 47-75.
- McDaniel and others (2000). *Marketing*. Ohio, Cincinnati: South-Western Publishing.
- Vlachos and others (2011). "Too much of a good thing: curvilinear effects in the evaluation of services and the mediating role of trust". *Journal of Services Marketing*, 25 (6), pp. 440-450.
- Rahman and others (2018) "Motivations and barriers to purchasing online: understanding consumer responses", *South Asian Journal of Business Studies*, 7 (1), pp. 111-128
- Redda (2020). "The Influence of Utilitarian and Hedonic Consumption Values on Consumer Attitude Towards Online Shopping and Purchasing Intentions". *Journal of Reviews on Global Economics*, 9, pp. 331-342
- Robson C. (2002). *Real word research*. Blackwell, Oxford
- To and others (2017). "Shopping motivations on Internet: A study based on utilitarian and hedonic Value". *Technovation*, 27, pp. 774-787.
- Vanishbancha (2007). *SPSS for Windows* (10th Edition). Bangkok: Chulabook.

Yu and others (2018). “Analysis on Consumers’ Purchase and Shopping Well-Being in Online Shopping

Carnivals with Two Motivational Dimensions”. *Sustainability*, 10 (12), p. 4603.

from:<https://www.bangkokpost.com/thailand/pr/2119527/the-changes-brought-by-covid-might-have-an-upside-for-thai-consumers-businesses-and-economy>

from:<https://www.statista.com/topics/7905/retail-shopping-behavior-in-thailand/>

from:<https://www.warc.com/newsandopinion/opinion/instant-convenience-how-online-grocery-shopping-has-taken-off-in-thailand/en-gb/4363>

THE EFFECTS OF CUSTOMER INCIVILITY ON HIGH-CONTACT SERVICE EMPLOYEES AND ORGANIZATIONAL BEHAVIORS: A FRAMEWORK AND ANALYSIS OF PROPOSITIONS

Asst. Prof. Dr. Papada Pitchayachananon

British College, Sripatum University

E-mail: papada.pi@spu.ac.th

Asst. Prof. Dr. Supavadee Nontakao

Sripatum International College, Sripatum University

E-mail: supavadee.no@spu.ac.th

ABSTRACT

The research objective of this paper is to study a broad context of emotional exhaustion and its importance to hospitality management. This knowledge would provide a better understanding of the factors that contribute to customer incivility, emotional exhaustion, job satisfaction, employees' perceived performance, and turnover intentions among high-contact service employees. Seven hypotheses are proposed to test the relationships between customer incivility and its determinants which are emotional exhaustion, job satisfaction, employees' perceived performance, and turnover intentions. This paper fills a gap in knowledge on the role of emotional exhaustion among high-contact service employees that has an impact on job satisfaction, employee's perceived performance, and turnover intentions. With the proposed conceptual framework, the author aims to clarify the effects of customer incivility on high-contact service employees and organizational behaviors which leads to the protection of employee morale and the pro-action of the management team to deal with the situations. The limitation is that the study should be extended beyond the conceptual stage and conduct the empirical research across the high-contact service employees in different countries, different industrial setting, and to explore the role of cultural differences on emotional exhaustion. The managerial implications would extend to improving the recruitment and evaluating the effectiveness of development programs such as a developing and retaining talent that drive the organization for success.

Keywords: customer incivility, emotional exhaustion, job satisfaction, employees' perceived performance, turnover intentions

Introduction

The hospitality industry is marked as one of the fastest outgrowing industries globally. This sector has experienced exponential growth, disruptive expansion, and intense competitive pressure over the years. The key success focuses ultimately on customer satisfaction, and employees' job performance and turnover intentions. Thus, customers' point of contact has become the first moment of truth that customers have experience with; the high-contact service employees. At the customer touch points, customers judge and form their attitude during service interactions (Ustrov, Valverde, & Ryan, 2016). By interacting with customers, the high-contact service

employees become the face of the brand who put the customer's high expectations on their shoulders. These expectations are to deliver high service quality, resolve customer complaints effectively, and make customers happy (Karatepe, Yorganci, & Haktanir, 2009), particularly when high-contact service employees encounter difficult customers (H. J. Kim, 2008).

As evidenced in service-oriented organizations literature suggests that the high-contact service employees are exposed to the stressful environment that associated with customer's complaints, demands, and incivility behavior (Sliter, Jex, Wolford, & McInnerney, 2010). The high-contact service employees are enacted to hold the philosophy of 'Customer is always right' and required to operate in unpleasant situations they don't have the right to avoid (Sliter et al., 2010). To please bad-mannered customers by serving them in a friendly and polite manner is not only the misfortune of the high-contact service employees, but also it leads to the exorbitant cost of the firms. Mistreated by customers, high-contact service employees can become exhausted emotionally and may eventually leave the firm (Karatepe et al., 2009). The real cost of employee turnover lies in the loss of productivity during the transition, decreased customer satisfaction, and financial loss including legal compensations, recruiting, hiring, and training (Tuominen, Hirvonen, Reijonen, & Laukkanen, 2016).

Customer incivility is defined as deviant customer behavior that violates workplace norms (Kern & Grandey, 2009), it is an employee's perception that he/she is being treated in an uncivil manner (van Jaarsveld, Walker, & Skarlicki, 2010), with a vague intention to harm an employee, and in violation of social norms of reciprocated respect and is considered one of the most dreadful forms of misconduct on service employees (Sliter et al., 2010). In fact, research confirms that over 98 percent of employees under the study reported experiencing uncivil behavior in their workplace (Schilpzand, De Pater, & Erez, 2016) whereas nearly 99 percent of 9,000 employees reported as the witness of incivility happening at work (Porath & Pearson, 2010).

A wealth of research on workplace incivility literature denotes that the devastating outcomes of negative deviate customer behavior upon the high-contact service employees; customer incivility, are associated with emotional exhaustion, job satisfaction, turnover intentions, and job performance (Arnold & Walsh, 2015; Cheng & O-Yang, 2018; Karatepe & Aleshinloye, 2009; Karatepe et al., 2009; Lam & Chen, 2012; Wilson & Holmval, 2013). The research showed that workplace incivility significantly increases emotional exhaustion (Cho, Bonn, Han, & Lee, 2016; W.-M. Hur, Moon, & Jun, 2016) which in turn, has a negative effect on job satisfaction (Cheng & O-Yang, 2018; W.-M. Hur et al., 2016; Lee & Ok, 2012), has a positive effect on turnover intention (W.-M. Hur et al., 2016; Karatepe & Aleshinloye, 2009; Yavas, Babakus, & Karatepe, 2008), and has a negative effect on job performance (Cho et al., 2016; W.-M. Hur et al., 2016). Boukis, A., Koritos, C., Daunt, K. L., & Papastathopoulos, A. (2020) emphasizes that supervisor's leadership style and recognize that an empowering leadership style can better relieve the exhausting impacts of both customer incivility forms on high-contact service employees' stress, contemplation, vengeance, and withdrawal intentions.

Recognizing the previous research has dedicated considerable effort in examining customer incivility using different kinds of high contact service industries including banks (Sliter et al., 2010; Sliter, Sliter, & Jex, 2012), department stores (W.-M. Hur et al., 2016), restaurants (Han, Bonn, & Cho, 2016), and call centers (van Jaarsveld et al., 2010) to name just a few, there have been limited studies that investigated the influences of customer incivility in the hospitality industry (Cho et al., 2016; H. Kim & Qu, 2018). In addition, when applied to the field of hospitality management, several critical questions regarding more specific roles of customer incivility remain unanswered.

First, the existing literature that although focused on customer incivility and investigated its relationship on emotional exhaustion, it is failed to extend the research on the effect of both customer incivility and emotional exhaustion on turnover intentions and job performance, but on employee incivility (H. Kim & Qu, 2018; van Jaarsveld et al., 2010), and some did on the customer orientation or customer service quality (Sliter et al., 2010). Second, though emotional exhaustion, turnover intention, and job satisfaction have gained attention from researcher, customer incivility had failed to put into a comprehensive view as one of the most significant antecedences in the existing hospitality literature; hotel industry literature in particular (Chen & Kao, 2012; Cheng & O-Yang, 2018; Chu, Baker, & Murrmann, 2012; W.-M. Hur, Moon, & Han, 2015; Karatepe, 2013; Karatepe & Aleshinloye, 2009; Karatepe et al., 2009; Lam & Chen, 2012; Lee & Ok, 2012). Third, even though the majority of workplace incivility research drawing their study by using the most frequently used instrument so called Workplace Incivility Scales (WIS) developed by Cortina, Magley, Hunter, and Day (2001) to investigate the effect on emotional exhaustion, the studies did not include customer-experienced incivility. If it did, it did not examine the differential effects of customer incivility directly on the high-contact service employees that was the main purpose of this research (Schilpzand et al., 2016).

Because of the nature of hotel business, hotel guests are with high expectation to be served. These customers are easy to get fussy when things are not going as they expected (Torres, van Niekerk, & Orlowski, 2017). The high-contact service employees are those with direct responsibility to solve problems and to please customers for their satisfaction. These make the high-contact service employees vulnerable especially when tasks require them to remain friendly and smiling in situations that evoke a stressors and strain triggering a reduction in individual emotional resources caused by excessive psychological demands (Karatepe & Aleshinloye, 2009). In addition, Schilpzand et al., (2016) commended that the uncivility experiences have been studies far and wide but intacted with problematic resulting from various factors involved. The authors recommended for the greater good that researcher indicates the source of incivility such as supervisor, coworker, or customer), the type of incivility (i.e., experienced, witnessed, or instigated), the method of inquiry (i.e., questionnaires, experimental study, or qualitative inquiry) and the time frame (i.e., retrospective, cross-sectional, and longitudinal) for a better interpretation and implication by practitioners. Furthermore, even though most of the empirical studies on experience customer incivility have focused on its consequences, there is rare research categorized the consequences into affective, attitudinal, cognitive, and behavioral outcomes.

To fill this void, this paper offers the holistic view of the relationships between customer incivility and emotional exhaustion, job satisfaction, employees' perceived performance, and turnover intentions. This study purposely extends the existing hospitality theory by developing and testing a comprehensive conceptual research model that, for the first time, encompasses all aforementioned constructs, takes the above recommendation into consideration, and applies to the context of the hotel industry. To be precise, this study seeks to investigate the relationships between how uncivil conduct made by hotel guests and its consequences. The hotel guests are indicated as the source of incivility. The high-contact service employees are categorized as experienced – type of incivility. This study includes emotional exhaustion as an affective outcome, job satisfaction as attitudinal outcome, employees' perceived job performance as cognitive outcome, and turnover intentions as behavioral outcome (Schilpzand et al., 2016). This cross-sectional study will be administered by questionnaires and the findings will yield a variety of useful management implications such as strategic directions for hotel managers in human resource management and organizational behaviors.

Literature Review and Hypothesis Development

Despite the insights from previous research, one of the most important questions about the effects of customer incivility remain unanswered in the field of hotel management, namely how customer incivility influences employees' emotional exhaustion, and specifically the precise mechanism through which customer incivility may increase emotional exhaustion, and its consequences for the targets of uncivil experiences. To void this gap in literature, this study explores a role for customer incivility and emotional exhaustion towards jobs satisfaction, job performance, and turnover intentions by drawing upon Conservation of Resources theory (COR) developed by Hobfoll (1989) and Affective Event Theory (AET) developed by Weiss and Cropanzano (1996).

Building upon COR theory, it provides a useful framework for the relationship between the two constructs. The COR theory suggests that resources are identified as environments including objects, personal characteristics, conditions, and energies that are valued by the individual who attempts to acquire, maintain, and preserve it (Stevan E. Hobfoll, 2001). The high-contact service employees are bonded to the mottoes of 'The Customer is King' when they encounter mistreated conducted by a bad-mannered customer. Based on the COR theory, the relationship between customer incivility and emotional exhaustion is explained by those the high-contact service employees' tolerant is depleted through the process of protecting organization's reputation, which in turns, causing emotional exhaustion.

Alike the COR theory, the AET contends that workplace events or experiences are agent of affective responses among the high-contact service employees. The experiences of customer incivility influence the high-contact service employees' subjective emotional reactions that expressed through deviate behaviors, which in turn determine their job-related attitudes and behaviors (Weiss & Cropanzano, 1996). Furthermore, according to the literature review of workplace incivility by Schilpzand et al. (2016), the authors suggest that the consequences of customer incivility is found to be related to various affective (i.e., emotional exhaustion), attitudinal outcome (i.e., job satisfaction), cognitive outcome (i.e., perceived job performance), and behavioral outcome (i.e., turnover intentions, job performance). Against this backdrop, the proposed research model suggested in this study is broadly consistent with the COR and AET theory (see Figure 1).

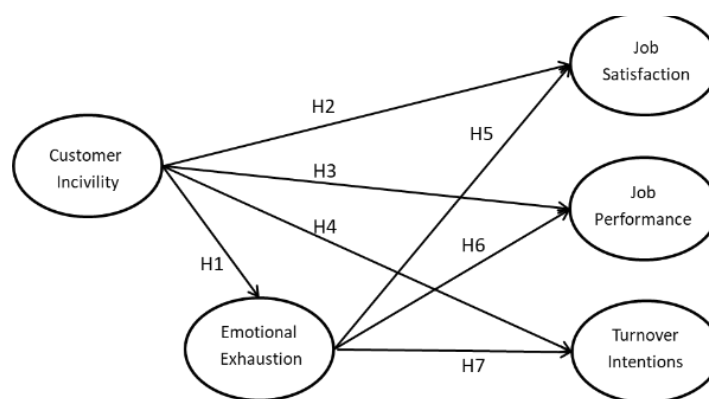


Figure 1 The Proposed Research Model

Customer incivility is defined as a perception of employee on customers that treating him/her in an uncivil manner (van Jaarsveld et al., 2010). Uncivil behaviors are seen as rude, discourteous, and showing no regard for others (Sliter et al., 2010). Although a one-time event of incivility in the workplace might not conjure

the high-contact service employees, the continued occurrence of incivility can gradually create unpleasant outcomes. As the fact that high-contact service employees are not capable of maintaining or preserving resources operated in the workplace due to its downward spiraling and pervasive nature while dealing with incivility customer, they are losing the resources provided by service-oriented organization and then are prone to strain such as emotional exhaustion (W. M. Hur, Kim, & Park, 2015).

Emotional exhaustion is defined as a feeling of “being over-extended and depleted of one's emotional resources” in response to “chronic interpersonal stressors on the job” (Maslach, Schaufeli, & Leiter, 2001, p. 399). It is arising from persistent high demands on time and energy that causes continual physical and psychological depletion. High-contact service employees work on a face-to-face and voice-to-voice basis when interact with customers to ensure delivering over expected service quality and gain customer satisfaction (Karatepe et al., 2009). When confronting with uncivil customers, high-contact service employees are threatened of losing their accumulated resources and become stressed about losing their conservation of resources while maintaining high afford to appear pleasant, creating a warm - welcoming environment, and controlling emotions in a process of service delivering to uncivil customers (Chu et al., 2012).

Extensive evidence in the study of workplace incivility is largely concerned with the occurrence of uncivil behaviour among co-workers or employee-to-employee interaction and its consequences on work-related outcomes such as job satisfaction (Lim, Cortina, & Magley, 2008), job performance (Yavas et al., 2008), turnover intentions (Sharma & Singh, 2016), and absenteeism (Sliter et al., 2012). While the workplace incivility has gained attention from the majority researcher, the evidence of customer incivility or customer-to-employee interactions and its consequences have gradually emerged (Han et al., 2016; W.-M. Hur et al., 2015; H. Kim & Qu, 2018).

Empirical studies show that customer incivility is positively related to emotional exhaustion in sales department setting (W.-M. Hare et al., 2015), in a retail setting (Kern & Grandey, 2009), and in bank setting (Sliter et al., 2010). Workplace incivility significantly increases emotional exhaustion and leads to low levels of job service performance in a restaurant setting (Cho et al., 2016) and in a hotel setting (Yavas et al., 2008). The experience of incivility is negatively related to job satisfaction and is positively related to turnover intentions (Karatepe et al., 2009; Lim et al., 2008). Accordingly, this study proposes the following hypotheses.

Hypothesis 1. Customer incivility has a significant and positive influence on emotional exhaustion.

Hypothesis 2. Customer incivility has a significant and negative influence on job satisfaction.

Hypothesis 3. Customer incivility has a significant and negative influence on job performance.

Hypothesis 4. Customer incivility has a significant and positive influence on turnover intentions.

Provided by the COR theory as a useful guideline for relationships, the further hypotheses examine the impacts of emotional exhaustion on job satisfaction, job performance, and turnover intentions. When employees interact with uncivil customer, they feel that they are losing scarce resources and tend to have emotional exhaustion, which in turn create employees' negative job-related outcomes (Karatepe et al., 2009). Alike the COR theory, the AET posits that the experiences of events at work (i.e., customer incivility, co-worker incivility, workplace incivility) create employees' responses or subjective emotional reactions (i.e., emotional exhaustion), that influence their job-related attitudes (i.e., job satisfaction), cognitive (i.e., employees' perceived job performance, and behaviours (i.e., turnover intentions) (Weiss & Cropanzano, 1996). Empirical evidence on emotional exhaustion literature suggests that it is an antecedent of various negative outcomes in the workplace

including customer orientation (W.-M. Hur et al., 2015), employee incivility (van Jaarsveld et al., 2010), service recovery performance (Karatepe et al., 2009), job performance (Cho et al., 2016; Karatepe & Aleshinloye, 2009), job satisfaction (Cheng & O-Yang, 2018; W. M. Hur et al., 2015; Karatepe et al., 2009; Lee & Ok, 2012), and turnover intention (Karatepe & Aleshinloye, 2009; Karatepe et al., 2009).

Job satisfaction refers to an employee's overall affective evaluation of the jobs and the organization to the degree to which an employee feels that his or her job-related needs are being met; it is a positive emotional state resulting from the consideration of one's job experience (Collie, Shapka, & Perry, 2012; Locke, 1976). Employees with emotional exhaustion often experience feelings of frustration, anxiety, depression, or indifference toward their work (Yavas et al., 2008). These negative feelings which result from emotional exhaustion have a negative influence on the magnitude of employees' job satisfaction. Recent research has reported the link between emotional exhaustion and job satisfaction (W. M. Hur et al., 2015; Karatepe et al., 2009; Lee & Ok, 2012; Yavas et al., 2008). Therefore, the following hypothesis is proposed.

Hypothesis 5. Emotional exhaustion has a significant and negative influence on job satisfaction.

In this study, job performance is defined as a mountable productivity, behavior, and outcomes that employees, in relative to his or her peers, contribute to the effectiveness of organization and to overall organizational performance (Babin & Boles, 1998; Viswesvaran & Ones, 2000). Turnover intentions as suggested by Carmeli and Weisberg (2006) refers to the withdrawal process, denoting the thoughts of quitting, the intention to search for a new job, and the intention to leave the organization. As discussed in the AET, emotional exhaustion is not the only a determinant of incivility from a customer, it is also a significant antecedent of job outcomes like job performance and turnover intentions.

Nevertheless, the impact of emotional exhaustion on job performance is varied. For instance, Cropanzano, Rupp, and Byrne (2003) reported subordinates and supervisors working for the large hospital in the western United States experiencing the emotional exhaustion demonstrated lower job performance. Janssen and Huang (2010) have shown a similar finding that there was a significant and negative relationship between emotional exhaustion and four indicators of job performance in the fashion chain stores in Mainland China and Hong Kong. In the food service business in the United States, the results showed that emotional exhaustion has a significant and negative relationship with service performance (Cho et al., 2016). Some researchers such as Karatepe and Aleshinloye (2009) reported that emotional exhaustion did a lower job performance but was not a significant relationship on the full-time high contact employees of five-star hotels in the sub-Saharan Africa context. Thus, the hypotheses are derived.

Hypothesis 6. Emotional exhaustion has a significant and negative influence on job performance.

Drawing upon the COR theory, once employees find they lose their scarce resources when interact with uncivil customers, they cannot perform effectively in a workplace and demonstrate turnover intentions as a result of resource loss and depletion of emotion (Karatepe & Aleshinloye, 2009). Empirical studies denoted the relationship between emotional exhaustion and turnover intention. For example, in the study conducted with retail bank employees in South Korea, Hur et al. (2015) found that emotional exhaustion has negative impact on job performance and positively related to turnover intentions. Likewise, junior personnel with psychological strain experiencing emotional exhaustion exerted a diminishing level of a job commitment and amplified the level of turnover intentions (Bridger, Day, & Morton, 2013). Similarly, in the hotel industry in Turkey, high-contact

service employees demonstrated a significant and positive effect of emotional exhaustion on turnover intentions (Yavas et al., 2008). In the light of the aforementioned research findings, the following hypothesis is presented.

Hypothesis 7. Emotional exhaustion has significant and positive influence on turnover intentions.

Analysis and Probable Outcomes

The theoretical underpinning of this paper is that there is an empirical link between customer incivility, emotional exhaustion, job performance, job satisfaction, and turnover intentions, that is yet to be ascertained in the extant literature. Customer incivility will be determined by items designed to tap an employee's perspective as uncivil manner they are treated by customers. Van Jaarsveld et al. (2010) conceptualized customer incivility based on the employee's perception on uncivil manner with ambiguous intent to harm an employee. This paper adopts this principle of customer incivility as a form of psychometric properties of the measures.

Emotional exhaustion will be measured via items designed to tap the feeling of employees who are under pressure and stress from disrespectful customers. Emotional exhaustion is a state of feeling empty and drained of all emotions; it is a feeling incapable to express anything due to physically and mentally energy levels are low. Maslach et al. (2001) conceptualized emotional exhaustion as a feeling of being overloaded and inefficiencies that depleted energy caused by excessive emotional demands made on people interacting with customers or clients. This paper adopts this principle of emotional exhaustion as a form of psychometric properties of the measures.

Job satisfaction will be measured via items designed to tap a degree to which employees enjoy their job. Locke (1976) conceptualized job satisfaction as an employees' overall affective evaluation towards their jobs and the organization which employs them. This paper adopts this principle of job satisfaction as a form of psychometric properties of the measures.

Employees' perceived job performance will be measured via items designed to tap the perception of oneself to the degree to which they provide the services at their top performed to the customers. Zhu, Yang, and Bai (2016) and Cho et al. (2016) conceptualized job performance as discrete activities performed by an individual that contributes to the core of an organization during a standard unit of time. This paper adopts this principle of employees' perceived job performance as a form of psychometric properties of the measures.

Turnover intentions will be measured via items designed to tap the desire or probability that an employee will change his or her job within a certain time. Carmeli and Weisberg (2006) conceptualized turnover intentions as to the withdrawal process including the thoughts of quitting job, the intention to search for another job, and then intention to quit. This paper adopts this principle turnover intentions as a form of psychometric properties of the measures.

The paper's primary purpose is to identify the relationship between customer incivility, emotional exhaustion, employees' perceived job performance, job satisfaction, and turnover intentions. This paper also examines the influence of customer incivility and emotional exhaustion on its consequences, including employees' perceived job performance, job satisfaction, and turnover intentions. The conceptualization posits a link between customer incivility and its consequences through emotional exhaustion highlighting the central role of emotional exhaustion in determining customer incivility when measured by employees' perceived job performance, job satisfaction, and turnover intentions. This is because high-contact service employees are key

resources who make the organization either superior or inferior. Thus, their state of mind certainly has an impact on the organization's performance.

Conclusions and Managerial Implications

This paper has sought to extend previous theoretical and empirical research on emotional exhaustion and customer incivility in the workplace involving face-to-face interactions between high-contact service employees and customers. Specifically, this paper is the very first conceptual framework that suggests investigating the consequences for the targets of uncivil experiences that occur to the high-contact service employees in four types of outcomes: affective, attitudinal, cognitive, and behavioural. Where emotional exhaustion is an affective outcome of customer incivility, it is a cause that has effects on the magnitude of job satisfaction, employees' perceived job performance, and turnover intentions.

The main managerial implications of such an examination would be, firstly, that it will provide a unique and holistic view to understanding the impact of customer incivility on the emotional experience of high-contact service employees. Secondly, it will contribute to a better understanding of how the high-contact service employees are restrained from scarce resources during the service processes to whom treated them with uncivil manner. Next, it will provide a guideline for managers to foresee the magnitude of the impact that uncivil manners have on the high-contact service employees in terms of their job satisfaction, job performance, and turnover intentions. Last, with the magnitude of the impact disclosed, manager will have a direction of human resource strategies to improve the situations. These include to increase job satisfaction, job performance, and retain talents by lower turnover intentions.

Designing proper strategies and programs are not easy if the real causes do not discover. The results of the study will be a tool for this designing process. The importance of such training programs will enhance the ability of the high-contact service employees to handle the situations. The highlight will be on how the high service contact employees shift their attitude when providing services. The strategies that support the high-contact service employees to learn more about their customers, to have empathy to customers' needs, and to deliver an excellent service outcome will be a turning point that benefits both organization and the high service contact employees themselves. Since the high-contact service employees play a significant role on determined the level of satisfaction/dissatisfaction by customers, their emotional disequilibrium should not be underestimated, therefore highlighting the importance of emotional exhaustion in the service encounter.

The managerial implications of such a study would encompass to advance the recruitment process for high-contact service employees, to evaluate the effectiveness of programs such as effective communication, service attitude, building relationship, and problem-solving skills. The implication would be extended to revisiting the management of the staff's performance and satisfaction through the understanding and management factors contributing to emotional exhaustion. These, in turn, should benefits service-oriented managers to weighing up their competitive advantages on customer satisfaction and organizational performance.

References

- Andersson, L. M., & Pearson, C. M. (1999). Tit for Tat? The Spiraling Effect of Incivility in the Workplace. *Academy of Management Review*, 24(3), 452-471.
- Arnold, K. A., & Walsh, M. M. (2015). Customer incivility and employee well-being: testing the moderating effects of meaning, perspective taking and transformational leadership. *Work & Stress*, 29(4), 362-378.
- Babin, B. J., & Boles, J. S. (1998). Employee behavior in a service environment: A model and test of potential differences between men and women. *The Journal of Marketing*, 62, 77-91.
- Boukis, A., Koritos, C., Daunt, K. L., & Papastathopoulos, A. (2020). Effects of customer incivility on frontline employees and the moderating role of supervisor leadership style. *Tourism Management*, 77, 103997.
- Bridger, R. S., Day, A. J., & Morton, K. (2013). Occupational stress and employee turnover. *Ergonomics*, 56(11), 1629-1639.
- Carmeli, A., & Weisberg, J. (2006). Exploring turnover intentions among three professional groups of employees. *Human Resource Development International*, 9(2), 191-206.
- Chen, C.-F., & Kao, Y.-L. (2012). Investigating the antecedents and consequences of burnout and isolation among flight attendants. *Tourism Management*, 33(4), 868-874.
- Cheng, J.-C., & O-Yang, Y. (2018). Hotel employee job crafting, burnout, and satisfaction: The moderating role of perceived organizational support. *International Journal of Hospitality Management*, 72, 78-85.
- Cho, M., Bonn, M. A., Han, S. J., & Lee, K. H. (2016). Workplace incivility and its effect upon restaurant frontline service employee emotions and service performance. *International Journal of Contemporary Hospitality Management*, 28(12), 2888-2912.
- Chu, K. H., Baker, M. A., & Murrmann, S. K. (2012). When we are onstage, we smile: The effects of emotional labor on employee work outcomes. *International Journal of Hospitality Management*, 31(3), 906-915.
- Collie, R. J., Shapka, J. D., & Perry, N. E. (2012). School climate and social-emotional learning: Predicting teacher stress, job satisfaction, and teaching efficacy. *Journal of educational psychology*, 104(4), 1189-1204.
- Cortina, L. M., Magley, V. J., Williams, J. H., & Langhout, R. D. (2001). Incivility in the workplace: incidence and impact. *Journal of occupational health psychology*, 6(1), 64-78.
- Cropanzano, R., Rupp, D. E., & Byrne, Z. S. (2003). The relationship of emotional exhaustion to work attitudes, job performance, and organizational citizenship behaviors. *Journal of Applied Psychology*, 88(1), 160-169.
- Han, S. J., Bonn, M. A., & Cho, M. (2016). The relationship between customer incivility, restaurant frontline service employee burnout and turnover intention. *International Journal of Hospitality Management*, 52, 97-106.
- Hobfoll, S. E. (2001). The Influence of Culture, Community, and the Nested-Self in the Stress Process: Advancing Conservation of Resources Theory. *Applied Psychology*, 50(3), 337-421.
- Hur, W.-M., Moon, T., & Jun, J.-K. (2016). The effect of workplace incivility on service employee creativity: the mediating role of emotional exhaustion and intrinsic motivation. *Journal of Services Marketing*, 30(3), 302-315.

- Hur, W.-M., Moon, T. W., & Han, S.-J. (2015). The effect of customer incivility on service employees' customer orientation through double-mediation of surface acting and emotional exhaustion. *Journal of Service Theory and Practice*, 25(4), 394-413.
- Hur, W. M., Kim, B. S., & Park, S. J. (2015). The Relationship between Coworker Incivility, Emotional Exhaustion, and Organizational Outcomes: The Mediating Role of Emotional Exhaustion. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 25(6), 701-712.
- Janssen, O., K., L. C., & Huang, X. (2010). Emotional exhaustion and job performance: The moderating roles of distributive justice and positive affect. *Journal of Organizational Behavior*, 31(6), 787-809.
- Karatepe, O. M. (2013). High-performance work practices, work social support and their effects on job embeddedness and turnover intentions. *International Journal of Contemporary Hospitality Management*, 25(6), 903-921.
- Karatepe, O. M., & Aleshinloye, K. D. (2009). Emotional dissonance and emotional exhaustion among hotel employees in Nigeria. *International Journal of Hospitality Management*, 28(3), 349-358.
- Karatepe, O. M., Yorganci, I., & Haktanir, M. (2009). Outcomes of customer verbal aggression among hotel employees. *International Journal of Contemporary Hospitality Management*, 21(6), 713-733.
- Kern, J. H., & Grandey, A. A. (2009). Customer incivility as a social stressor: the role of race and racial identity for service employees. *Journal of occupational health psychology*, 14(1), 46-59.
- Kim, H., & Qu, H. (2018). The Effects of Experienced Customer Incivility on Employees' Behavior Toward Customers and Coworkers. *Journal of Hospitality & Tourism Research*, 0(0), 1-20
- Kim, H. J. (2008). Hotel service providers' emotional labor: The antecedents and effects on burnout. *International Journal of Hospitality Management*, 27(2), 151-161.
- Lam, W., & Chen, Z. (2012). When I put on my service mask: Determinants and outcomes of emotional labor among hotel service providers according to affective event theory. *International Journal of Hospitality Management*, 31(1), 3-11.
- Lee, J., & Ok, C. (2012). Reducing burnout and enhancing job satisfaction: Critical role of hotel employees' emotional intelligence and emotional labor. *International Journal of Hospitality Management*, 31(4), 1101-1112.
- Lim, S., Cortina, L. M., & Magley, V. J. (2008). Personal and workgroup incivility: Impact on work and health outcomes. *Journal of Applied Psychology*, 93(1), 95-107.
- Locke, E. A. (1976). The nature and causes of job satisfaction. *Handbook of industrial and organizational psychology*.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job Burnout. *Annual Review of Psychology*, 52(1), 397-422.
- Phillips, B., Tsu, W. T. T., & Julian, C. (2006). The theoretical underpinnings of emotional dissonance: a framework and analysis of propositions. *Journal of Services Marketing*, 20(7), 471-478.
- Porath, C. L., & Pearson, C. M. (2010). The cost of bad behavior. *Organizational Dynamics*, 39(1), 64-71.
- Schilpzand, P., De Pater, I. E., & Erez, A. (2016). Workplace incivility: A review of the literature and agenda for future research. *Journal of Organizational Behavior*, 37(S1), 57-88.
- Sharma, N., & Singh, V. K. (2016). Effect of workplace incivility on job satisfaction and turnover intentions in India. *South Asian Journal of Global Business Research*, 5(2), 234-249.

- Sliter, M., Jex, S., Wolford, K., & McInnerney, J. (2010). How rude! Emotional labor as a mediator between customer incivility and employee outcomes. *Journal of occupational health psychology*, 15(4), 468-481.
- Sliter, M., Sliter, K., & Jex, S. (2012). The employee as a punching bag: The effect of multiple sources of incivility on employee withdrawal behavior and sales performance. *Journal of Organizational Behavior*, 33(1), 121-139.
- Torres, E. N., van Niekerk, M., & Orlowski, M. (2017). Customer and Employee Incivility and Its Causal Effects in the Hospitality Industry. *Journal of Hospitality Marketing & Management*, 26(1), 48-66.
- Tuominen, S., Hirvonen, S., Reijonen, H., & Laukkanen, T. (2016). The internal branding process and financial performance in service companies: An examination of the required steps. *Journal of Brand Management*, 23(3), 306-326.
- Ustrov, Y., Valverde, M., & Ryan, G. (2016). Insights into emotional contagion and its effects at the hotel front desk. *International Journal of Contemporary Hospitality Management*, 28(10), 2285-2309.
- van Jaarsveld, D. D., Walker, D. D., & Skarlicki, D. P. (2010). The Role of Job Demands and Emotional Exhaustion in the Relationship Between Customer and Employee Incivility. *Journal of Management*, 36(6), 1486-1504.
- Viswesvaran, C., & Ones, D. S. (2000). Perspectives on Models of Job Performance. *International Journal of Selection and Assessment*, 8(4), 216-226.
- Weiss, H. M., & Cropanzano, R. (1996). Affective Events Theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work *Research in organizational behavior: An annual series of analytical essays and critical reviews*, 18(1), 1-74.
- Wilson, N. L., & Holmvall, C. M. (2013). The development and validation of the Incivility from Customers Scale. *Journal of occupational health psychology*, 18(3), 310-326.
- Yavas, U., Babakus, E., & Karatepe, O. M. (2008). Attitudinal and behavioral consequences of work-family conflict and family-work conflict: Does gender matter? *International Journal of Service Industry Management*, 19(1), 7-31.
- Zhu, Y., Yang, H., & Bai, G. (2016). Effect of Superior-Subordinate Intergenerational Conflict on Job Performance of New Generation Employees. *Social Behavior and Personality: an international journal*, 44(9), 1499-1513.

FACTORS AFFECTING CHINESE ONLINE PURCHASE INTENTION TOWARD LOUIS VUITTON HANDBAG-STUDY OF CHONGQING, CHINA

Hanwei Huang

Graduate Student, Assumption University of Thailand

E-mail: 47345943@qq.com

Seongdok Kim

Lecturer, Assumption University of Thailand

E-mail: seongdokkim@au.edu

ABSTRACT

This research is aimed at examining the factors affecting Chinese online purchase intention toward Louis Vuitton handbag. In-depth literature review on previous research on purchase intention and on Technology Acceptance Model, independent variables which are attitude, perceived usefulness, perceived ease of use and perceived risk are selected.

The survey questionnaire was distributed to Chongqing residents who have purchase intention toward Louis Vuitton handbag using convenience sampling and snowball sampling. 405 survey questionnaires are collected via online Wenjuanxing. Descriptive and inferential statistics are utilized and multiple linear regression is performed for hypotheses testing.

The results of this research proved that perceived ease of use is the strongest variable followed by perceived usefulness, attitude, and perceived risk respectively. Some practical strategies on these four factors are suggested for sustainable market success.

Keywords: Purchase intention, China, Attitude, Perceived usefulness, Perceived ease of use, Perceived risk, Technology acceptance model (TAM)

1. Introduction

The global luxury goods suffered a lot just as same as other industry from this unprecedented pandemic, whose demand home and abroad was dramatically shrinking. The luxury market is projected to make recovery in the first quarter of 2021, depending on whether the COVID-19 is effectively contained and the global tourism industry recovers over the course of the year. As data from Bain & Company (2021), After the heavy impact of COVID-19 on the channel, online channel will accelerate to 28%-30%, becoming the #1 channel by 2025. Bain & Company's data show that China's domestic luxury market grew 48% to nearly US \$55 billion in 2020. In fact, after the COVID-19 was brought under control, sales of luxury goods in China rebounded strongly. China occupied 20% share of the global luxury market in 2020 increasing by 9 percent compared with 2019.

This growth is likely to continue in the following years, and China's domestic luxury market is expected to take the largest share of the global luxury market.

As the data from Bain & Company (2021), the value of the leading 10 most valuable luxury brands, Louis Vuitton is far ahead of the rest, with a brand value of about US \$75.7 billion in 2021. Sales of luxury accessories have held up well amid a decline in luxury sales, the accessories mainly handbag accounted for 36% of the global personal luxury goods market by product category. As an emerging first-tier city, Chongqing's economy is developing rapidly. In 2020, Chongqing's GDP amounted to approximately 2.5 trillion yuan (about US \$386 billion), making it the fifth largest city in China (Yan, 2021). With the development of economy, people have more consumption demand for luxury goods. Chongqing has the largest Louis Vuitton store in China, and there are no stores in nearby provinces, such as Guizhou province, so the market of Louis Vuitton in Chongqing includes other surrounding cities. Chongqing is chosen as a research city because it is a representative of first-tier cities in China, has a huge customer base and an important position in the market.

To sum up, after impact of COVID-19, China's domestic luxury market is expected to grow further, making it the world's largest luxury market and the online channel will become the #1 channel by 2025. At the same time, the sales of handbags are higher than other products in the market share of personal luxury goods, and Louis Vuitton brand value is the first in the world, so the researchers take the online sales of Louis Vuitton handbag as the object of this study.

The objective of this current research is aimed at examining the effect of TAM factors on Chinese online purchase intention toward Louis Vuitton handbag. Thus the researchers will develop a framework based on in-depth literature review on theories and previous studies.

2. Literature Review

2.1.1 Technology acceptance model (TAM)

The technology acceptance model (TAM) is a model derived from social psychology theories: the theory of reasoned action (TRA) and the theory of planned behavior (TPB). Davis (1989) proposed the causal relationship of belief - attitude - intention - behavior to explain and predict the degree of acceptance of technology by potential users, and to explain the technical behavior of end-users. This model assumes that consumer's attitude to technology acceptance plays a vital role in affecting consumer's behavioral intention in using technology, meanwhile the attitudes are directly affected by the utility the user can perceive. Theoretically, the technology acceptance model (TAM) is the basis of this research, aiming to examine the its applicability in the aspect of explaining Chinese consumer's behavior in purchasing Louis Vuitton handbags online.

Some previous studies have achieved impressive progress in nourishing novel models by means of adding some variables to TAM (Galib et al., 2018). On the basis of existing review of literature, the study added one exogenous factor of "perceived risk" to the existing the technology acceptancy model, which makes it much more explanatory and better helps to predict China's consumer's behavior in buying Louis Vuitton handbags.

The TAM assumes that behavioral intentions determine whether people use the technology system (here, on-line shopping channel) or not, and the attitudes that users would like to use and perceive utility govern the behavioral intentions. This attitude was governed by the perceived usefulness and ease of use. Technology acceptance model (TAM) The usability and ease of using website information can reduce the asymmetry of online information and have a positive impact on consumers' purchase intention (Legris et al., 2003).

2.1.2 Purchase intention

Purchase intention is used to measure one's intention to perform a specific behavior or make the decision to buy a product or service (Amoroso, 2016). A consumer's purchasing intention implies his or her attitude to a kind of specific behavior when making a purchase and his or her degree of willingness to pay for the products or service (Zhang et al., 2013).

There are various researchers who study on the factors affecting purchase intention. Jhamb et al. (2020) proved that purchase intention is influenced by attitude. The relationship between conspicuous value and luxury purchase intention, according to Jain (2020), can be mediated by that attitude. Ahn et al., (2014) revealed that the perceived ease of use, perceived usefulness positive effects on purchase intention, but perceived risk had negative effect on purchase intention. Sangwan (2021) indicated that perceived usefulness and perceived ease of use positively influence customers' intention to purchase. Ariffin et al., (2018) revealed that the perceived risk has a significant negative influence on consumer online purchase intention.

2.1.3 Attitude (ATT)

Attitude toward behavior is defined as "an individual's positive or negative feeling regarding performing the target behavior" (Fishbein & Ajzen, 1975, p. 216). In the light of the TRA model (Ajzen et al., 1980), attitude toward behavior is governed by an individual's salient beliefs and the behavior could result in kinds of certain outcomes, and that individual will evaluate these outcomes. Various studies have revealed that attitude partially mediated the luxury purchase intention (Jain, 2020). Attitude plays a significant role in determining consumer's intention of buying luxury goods. (Jain et al., 2017; Chetoui et al., 2020). Therefore, it is required to study the influence of attitude toward the purchase intention of luxury products (Kaur et al., 2021).

2.1.4 Perceived usefulness (PU)

Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance their job performance (Davis, 1989). It means whether or not someone perceives that technology to be useful for what they want to do. This perspective will influence consumer's attitudes toward digital buying and their willingness to make the purchase of the Louis Vuitton handbag online. A study conducted by Marquez et al. (2019) showed that perceived usefulness positively affects digital purchase intentions. Sangwan et al. (2021) and Jain (2020) found perceived usefulness exerts considerable impact on customers' intention to purchase online.

2.1.5 Perceived ease of use (PEOU)

Perceived ease of use (PEOU) is defined as the degree to which a person believes that using a particular system would be free of effort (Davis, 1989). In this study, this definition refers to the effort that

individuals perceive to cost least to purchase Louis Vuitton handbag online. Marquez et al. (2019) examined the intention of purchasing luxury goods online was affected by perceived ease of use effects. Ahn (2014), Sangwan et al. (2021) and Jain (2020) stated that perceived ease of use affect customers' intention of buying online.

2.1.6 Perceived risk (PR)

Perceived risk refers to the spirit cost related to consumer's behavior of buying, which is the manifestation of kinds of uncertainties about the future. Bauer (1960) found that perceived risk is a kind of risk that consumer actively perceive as they know nothing about the product information. In the context of this study, PR is the expected negative utility linked with the purchase of a Louis Vuitton handbag online. For luxury brands, compared with in-store shopping, shopping online endures more perceived risk. Yu et al. (2018), Pham (2017), and Ariffin et al. (2018) found that perceived risk negatively influence consumer online purchase intention.

2.2 Research Framework

In this section, the researchers develop the conceptual framework from literature review on theories and previous research identifying attitude (ATT), perceived usefulness (PU), perceived ease of use (PEOU) and perceived risk (PR) as independent variables.

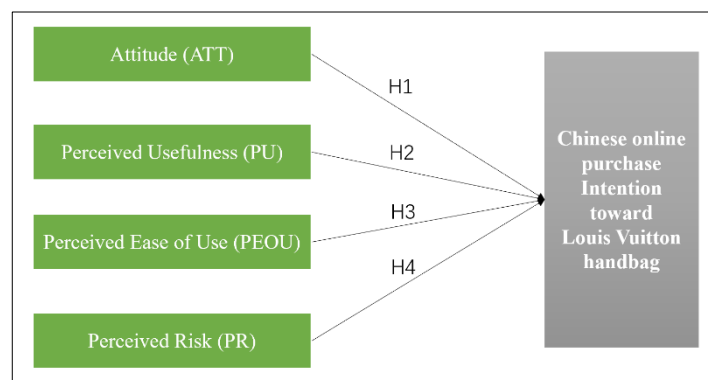


Figure 1 Research Framework

2.3 Research Hypotheses

H1: Attitude positively affects Chinese online purchase intention toward Louis Vuitton handbag.

H2: Perceived usefulness positively affects Chinese online purchase intention toward Louis Vuitton handbag.

H3: Perceived ease of use positively affects Chinese online purchase intention toward Louis Vuitton handbag.

H4: Perceived risk negatively affects Chinese online purchase intention toward Louis Vuitton handbag.

3. Research Methodology

3.1 Research Design

The research applied quantitative research using survey questionnaire. Firstly, IOC was not tested since survey questionnaire developed by Jain (2020) was adopted in this research. Reliability was conducted to ensure internal consistency of the questionnaire. Secondly, this research employed descriptive statistics to describe the demographic characteristics of respondents. At last, in order to examine the causal relationship, multiple regression was applied. Researchers used survey questionnaire (Jain, 2020) which is measured by 5 points Likert Scale. The scales range from strongly disagree (1) to strongly agree (5).

3.2 Population, Sample, and Sampling Procedure

Those who are living in Chongqing and have purchase intention toward Louis Vuitton handbag are the target respondents of this research. Based on Krejcie and Morgan (1970), the minimum sample size for population of over 1 million should be 384. The samples were collected from 405 persons. The questionnaires were distributed via online Wenjuanxing (similar to Google forms). The questionnaire consists of screening questions (Do you live in Chongqing, Do you have purchase intention toward Louis Vuitton handbag), demographic information questions, and measuring variables. The researchers utilized convenient sampling and snowball sampling. The researcher distributed the survey to people of personal networks and let the networks (i.e., friends, colleagues) spread the survey to their own networks.

3.3 Research Instrument

Jain's survey questionnaire (2020) is used in this current research as aforementioned. The researcher applied Cronbach's Alpha in order to test the reliability of the variables. Pre-testing for 30 samples indicated that all of variables are reliable exceeding 0.7. (Jiradilok et al., 2014).

Table 1 Pre-Testing Result (N=30)

Variables	Cronbach's Alpha	Number of Item
Dependent Variable		
Purchase intention	0.867	3
Independent Variables		
Attitude (ATT)	0.816	3
Perceived usefulness (PU)	0.813	4
Perceived ease of use (PEOU)	0.795	4
Perceived risk (PR)	0.904	4

3.4 Data Analysis

3.4.1 Descriptive Statistics

From the total of 405 questionnaires, all of respondents (100%) live in Chongqing and have purchase intention toward Louis Vuitton handbag in screen questions. The majority of respondents were female

with a percentage of 57.28% (232 respondents) while the percentage of male respondents was 42.72% (173 respondents). The majority is 150 respondents (37.04%) aged between 30-39 years old, 106 respondents (26.17%) aged between 40-49 years old, 100 respondents (24.69%) aged between 20-29 years old and 36 respondents (8.89%) aged 50 years old and over. There were 13 respondents (3.21%) who were under 20 years old. In terms of monthly income, 141 respondents (34.81%) have monthly income US \$775-\$1,550, followed by US \$1,550.1-\$2,325 with 100 respondents (24.69%), US \$2,325.1-\$3,100 and US \$775 with 40 respondents (9.88%), and US \$3,100 with 26 respondents (6.42%).

3.4.2 Multiple linear regression

From the Table 2, R square value is 0.853 which indicating 85.3% of the variations in Chinese online purchase intention toward Louis Vuitton handbag can be explained by four independent variables in this research.

Table 2 Model Summary from Multiple Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.924a	0.853	0.852	0.447315149

As the Table 3 shows, the significant-value of attitude, perceived usefulness, perceived ease of use and perceived risk are less than 0.05 which means that these four variables statistically influence Chinese online purchase intention. The standardized Beta coefficients of 4 independent variables are 23.4%, 26.4%, 31.5% and 15.2% respectively. This result can indicate that every 1 unit increase in these four variables, Chongqing Chinese online purchase intention will increase by 23.4%, by 26.4%, by 31.5%, and by 15.2% respectively.

Table 3 Multiple Linear Regression Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Significant value	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
H1	0.234	0.044	0.234	5.32	0.000	0.190	5.262
H2	0.271	0.055	0.264	4.90	0.000	0.127	7.881
H3	0.324	0.058	0.315	5.61	0.000	0.116	8.595
H4	0.154	0.045	0.152	3.41	0.000	0.184	5.425

a. Dependent Variable: Chinese online purchase intention toward Louis Vuitton handbag

In this research, the variance inflation factor of four variables are 5.262, 7.881, 8.595 and 5.425 respectively, which is less than 10 or in some sense, indicating that there is no multicollinearity problem (Menard, 2001).

4. Summary of the Findings

In all 405 respondents, majority of the genders were female with age level between 30-39 years old. Regarding monthly income, approximately 141 respondents have income of US \$775-\$1,550. There are four hypotheses proposed and all hypotheses (H1, H2, H3 and H4) were supported. The regression analysis proves that perceived ease of use had the most significant influence on Chinese online purchase intention, followed by perceived usefulness, attitude and perceived risk. The following section compares results of this current research with those of the previous studies.

5. Discussion

5.1 Attitude

The result showed that attitude positively affects Chinese online purchase intention toward Louis Vuitton handbag. The result supports the previous research such as Jain (2020) who proved that attitude partially mediated the luxury purchase intention. And it is also consistent with Jain, Khan et al., (2017) whose studies demonstrated that the attitude affects customer's intention to buy luxury fashion products.

5.2 Perceived usefulness

From the result we can draw a conclusion that the perceive usefulness exerts has a positive impact on Chinese online purchase intention. It supports the previous research of Marquez et al. (2019) who proved that the perceived usefulness positively influences digital purchase intentions. And it is also consistent with Sangwan et al. (2021) and Jain (2020) whose studies proved that perceived usefulness impact on customers' intention to purchase online.

5.3 Perceived ease of use

The results proved that perceived ease of use has positive impact on Chinese online purchase intention. The result supports the previous research of Ahn (2014) who proved that perceived ease of use positively influence purchase intention in online shopping. Moreover, the result supports Sangwan et al. (2021) who stated that perceived ease of use has effect on customers' intention to purchase online.

5.4 Perceived risk

The finding of this study indicated that perceived risk negatively affects Chinese online purchase intention toward Louis Vuitton handbag. The finding supports Yu et al. (2018) which indicated that regarding luxury brands, the perceived risk of shopping via the Internet is much more eminent compared with real store shopping due to notorious reputation of the Internet in selling fake products. Furthermore, the result supports Ariffin et al. (2018) who mentioned that perceived risk affects consumer online purchase intention.

6. Suggestion

As the domestic market in China is expected to become the world's largest luxury goods market by 2025, and handbags are the most popular products among consumers, this is an opportunity for all luxury brands to further open the Chinese market. Referring to the result of Standardized Coefficients Beta, perceived ease of

use is the strongest variable followed by perceived usefulness, attitude, and perceived risk respectively. Therefore, Louis Vuitton handbag online business may further develop on these four areas to increase purchase intention for sustainable market success. These recommendations are stemmed from descriptive statistics result because the lowest mean score of the survey questionnaire indicates Louis Vuitton does not perform well in that specific area.

Regarding perceived ease of use, the lowest mean score of perceived ease of use questionnaires are “It doesn't take much effort to buy Louis Vuitton bag online” and “Buying Louis Vuitton handbags online allows me to shop anytime, anywhere”. Louis Vuitton should therefore improve the design of its website to make it easier for customers to place orders. They can consider hiring Chinese-speaking customer service staff in the opposite time zone for the Chinese official website, so that Chinese customers can get timely response at night and purchase easily at any time.

Regarding perceived usefulness, the lowest mean score of perceived usefulness question is “Buying Louis Vuitton handbag online would give me greater product choice”. Thus Louis Vuitton can launch some special products designed only for online sales to provide customers with greater choices.

As for attitude, the lowest mean score of attitude question is “Buying Louis Vuitton handbag online is simple”. Thus Louis Vuitton should increase other online shopping channels, in addition to the official websites, cooperate with Chinese shopping websites with large numbers of users, such as Tmall (Taobao) and JD.com, the new channels which are familiar to local customers will make online buying much simpler.

The fourth factor that need to concern is perceived risk. The lowest mean score of perceived risk question is “Shopping Louis Vuitton handbag online may not be secure (insecurity of financial transactions)”. Thus Louis Vuitton handbag online business should use more secure payment technologies. They can cooperate with some famous third-party payment platforms in China, like Alipay or Wechat-Pay, to get payment technology support and convince customers that their payments on the official website are safe.

7. References

- Ahn, T., Ik Suh, Y., Lee, J.K. & Pedersen, P.M. (2014). Understanding purchasing intentions in secondary sports ticket websites. *International Journal of Sports Marketing and Sponsorship*, 16(1), 35-49.
- Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*, PrenticeHall, Englewood Cliffs, NJ.
- Amoroso, D. L., Roman, F. L. & Morco, R. (2016). E-Commerce Online Purchase Intention: Importance of Corporate Social Responsibility Issues. In *encyclopedia of E-Commerce Development, Implementation, and Management*. Hershey, PA: IGI. doi:10.4018/978-1-4666-9787-4.CH114
- Ariffin, S. K., Mohan, T., & Goh, Y.-N. (2018). Influence of consumers' perceived risk on consumers' online purchase intention. *Journal of Research in Interactive Marketing*, 12(3), 309-327.
- Bain & Company. (2021). *Global personal luxury goods market on track for recovery* [Online]. Retrieved May 17, 2021, from <https://www.bain.com/about/media-center/press-releases/2021/Global-personal-luxury-goods-market-on-track-for-recovery>.

- Chetoui, Y., Benlafqih, H. & Lebdaoui, H. (2020), How fashion influencers contribute to consumers' purchase intention. *Journal of Fashion Marketing and Management: An International Journal*, 24(3), 361-380.
- Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1989), *User acceptance of computer technology: a comparison of two theoretical models*. *Management Science*, 35(8), 982-1003.
- Galib, M.H., Hammou, K.A. & Steiger, J. (2018). Predicting consumer behavior: an extension of technology acceptance model. *International Journal of Marketing Studies*, 10(3), 73-90.
- Jain, S., Khan, M.N. & Mishra, S. (2017). Understanding consumer behavior regarding luxury fashion goods in India based on the theory of planned behavior. *Journal of Asia Business Studies*, 11(1), 4-21.
- Jain, S. (2020). Examining the moderating role of perceived risk and web atmospherics in online luxury purchase intention. *Journal of Fashion Marketing and Management: An International Journal*, 25(4), 585-605.
- Jhamb, D., Aggarwal, A., Mittal, A. & Paul, J. (2020). Experience and attitude towards luxury brands consumption in an emerging market. *European Business Review*, 32(5), 909-936.
- Kaur, J., Parida, R., Ghosh, S., Lavuri, R. (2021). Impact of materialism on purchase intention of sustainable luxury goods: an empirical study in India. *Society and Business Review*, 1746-5680 DOI 10.1108/SBR-10-2020-0130
- Krejcie, R.V., & Morgan, D.W., (1970). *Determining Sample Size for Research Activities*. Educational and Psychological Measurement.
- Legris P., Ingham J., & Collerette P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40(3), 191-204.
- Marquez, A., Cianfrone, B. A., & Kellison, T. (2019). Factors affecting spectators' adoption of digital ticketing: the case of interscholastic sports. *International Journal of Sports Marketing and Sponsorship*, 21(3), 527-541
- Menard S. (2001). *Applied Logistic Regression Analysis*. Sage Publications, 18-20, <https://dx.doi.org/10.4135/9781412983433>
- Sangwan, S., Sharma, S. K., & Sharma, J. (2021). Disclosing customers' intentions to use social media for purchase-related decisions. *Asia-Pacific Journal of Business Administration*, 1757-4323, DOI 10.1108/APJBA-02-2021-0061
- Yan, V. (2021). *Chongqing Achieves a Regional GDP of 386 billion USD in 2020* [Online]. Retrieved Jan 23, 2021, from <https://www.ichongqing.info/2021/01/23/chongqing-achieves-a-regional-gdp-of-386-07-billion-usd-in-2020>.
- Yu, S., Hudders, L. & Cauberghe, V. (2018). Selling luxury products online: the effect of a quality label on risk perception, purchase intention and attitude toward the brand. *Journal of Electronic Commerce*, 19(1), 16-35.
- Zhang, B. & Kim, J.H. (2013). Luxury fashion consumption in China: factors affecting attitude and purchase intent. *Journal of Retailing and Consumer Services*, 20(1), 68-79.

ANTECEDENTS OF EMPLOYEE INTENTION TO STAY : A CASE STUDY OF A COMMUNICATION TECHNOLOGY COMPANY IN CHINA

Boqi Wang

Graduate School, Kasem Bundit University

E-mail: 297189163@qq.com

Sasithorn Suwandee

Business School, Kasem Bundit University

E-mail: sasithorn.suw@kbu.ac.th

Felicito Jabutay

Business School, Kasem Bundit University

E-mail: felicito.jab@kbu.ac.th

Suwat Vongsinsirikul

Graduate School, Kasem Bundit University

E-mail: suwat.von@kbu.ac.th

ABSTRACT

This study aims to explore the effect of intrinsic motivation and extrinsic motivation on job satisfaction. This research also examined the impact of job satisfaction on intention to stay. The study extends two-factor theory of employee motivation in a telecommunication technology company in China while applies social exchange theory to present the impact of job satisfaction on intention to stay. This study uses quantitative approach via self-administered questionnaire. The study collected the data from 240 employees of a communication technology company in Yunnan province, China. This study use regression anylysis to test hypotheses. The findings suggested that intrinsic motivation and extrinsic motivation have statistically significantly positive impact on job satisfaction. Meanwhile, job satisfaction ($\beta=0.786$) has statistically significantly positive impact on intention to stay. This study found that extrinsic motivation ($\beta=0.646$) has stronger impact on job satisfaction than intrinsic motivation ($\beta=0.345$). Hence, the company should focus on improving extrinsic motivation of employee such as pay, supervisor.

Keywords: Intrinsic motivation, Extrinsic motivation, Job satisfaction, Intention to stay, technology communication company

1. Introduction

China is the world's largest market for mobile technology. Since the reform and open up, the telecommunications industry has grown from weak to strong, with the total volume of telecommunications business growing from 1.92 billion yuan in 1978 to 2,755.7 billion yuan in 2017 (National Bureau of Statistics, 2018). China has made a historic leap from following 2G, breaking through 3G, and synchronizing 4G to leading 5G. In 2017, China had 1.42 billion mobile internet users which included 1.13 billion mobile broadband users (i.e., 3G and 4G users) and 750 million mobile internet users which were 4.9 times and 1.8 times the 2012 numbers respectively. Mobile internet access traffic was 24.6 billion GB which was 28.6 times that of 2012. China has entered the era of mobile internet and is on its way to becoming a powerful country in the internet (National Bureau of Statistics, 2018). The competition among telecom operators is becoming more intense, and the operators are more focused on their own brands and customers. The core business has gradually transferred the work of the construction, maintenance, and optimization of the communication network to the equipment supplier and the professional communication technology service provider. On the other hand, with the rapid development of the China Telecom industry, the growth of telecom business has also brought about the rapid development of the scale of communication technology service market. The Chinese communication technology service providers depend on the communication operators. They must keep up with the development of communication technology and even keep a certain prospect to provide all kinds of communication technology services for the operators and occupy the dominant position in the competition.

The fierce competition in telecommunication industry forces the company to retain talent employee. Therefore, the company needs to implement strategies to mitigate employee turnover problems. The motivation of employees in all positions can improve the efficiency, business success, and sustainability of telecommunications. Selecting the right structure of motivation factors can create right kind of results (Lorincova and others, 2019). Employee motivation is one of the most important factors to improve employee performance and organizational performance (Sandhya & Kumar, 2011). The managers must be always aware to bring up the new strategies to satisfy the employees in order to develop the organization's performance and productivity and the employee develops their mind to intention to stay more (Lambert & Hogan, 2009). Mohlala (2011) asserted that employee intention to stay has become the most important focus of the major communication technology companies, and the retention of talent has become an important part of the company's human resource strategy. It is crucial to the construction of a highly efficient talent team and flourishing companies.

Research problem of this study is focused on impact of intrinsic motivation and extrinsic motivation on job satisfaction as well as the impact of job satisfaction on intention to stay. The study extends two-factor theory of employee motivation in a telecommunication technology company in China while applies social exchange theory to present the impact of job satisfaction on intention to stay.

2. Research Objective

- (1) To explore the role of intrinsic motivation and extrinsic motivation on job satisfaction and employee intention to stay.
- (2) To study the role of job satisfaction on employee intention to stay.
- (3) To extend two-factor theory of employee motivation in a telecommunication technology company in China while applies social exchange theory to present the impact of job satisfaction on intention to stay.

3. Literature Review

3.1 Theory, Concept and Related Research

Two-factor theory

Herzberg (1968) suggested in two-factors theory of motivation that there were two factors driving employee satisfaction in the workplace: motivation factors and hygiene factors. The hygiene factor theoretically satisfies the first three level of Maslow's hierarchy of needs (McLeod, 2007). The hygiene factor purpose is to prevent employee dissatisfaction. These factors encourage employee to work hard and enjoy their work, thus, develop extrinsic motivation within the workforce (Herzberg, 1976, 1984). Company policy and administration, supervision, interpersonal relations, working conditions, salary, job security are hygiene factors. In contrast, motivators are achievement, the work itself, responsibility, advancement, and growth (Katt & Condly, 2009) which induce intrinsic motivation. On the contrary, salary could be a motivator if it represents a symbol of achievement at work (Hyun & Oh, 2011).

According to Gopalan and others (2017), intrinsic motivation depicts an activity done only for own contentment without any external anticipation. Legault (2016) asserted that intrinsic motivation is for enjoyable and challenge. Extrinsic motivation was often defined in terms of external sources (e.g., rewards, deadlines, competition). They also suggest that extrinsic motivation can contribute to well-being and performance when coming from values with which the person identifies or which are fully integrated within the person, even though the person was not intrinsically motivated (Sansone & Harackiewicz, 2000). Legault (2020) suggested that extrinsic motivation arises from an externally or socially created reason to perform an action. Extrinsic motivators such as money or other rewards can produce extrinsic motivation due to the fact that they generate desire for the consequence of the activity; they do not produce desire to engage in the activity for its own sake. Intrinsic motivation and extrinsic motivation could lead to job satisfaction.

Job satisfaction refers to the employees' psychological and physiological satisfaction with the working environment and the work itself, as well as the workers' subjective reaction to the work situation (Hoppock, 1935). Job satisfaction is a worker's sense of achievement on the job (Aziri, 2011).

Social exchange theory

Social exchange-relationships develop when employers properly manage employees, which would produce beneficial consequences (Cropanzano & Mitchell, 2005). Blau (1964) asserted that social exchange includes favors that foster future obligations while the nature of the return cannot be bargained. Social exchange

is different from economic exchange. Social exchange tends to induce feelings of personal obligations, gratitude, and trust. Hence, intention to stay of employee is the feelings of personal obligations.

Naim and Lenkla (2016) suggested that intention to stay refers to the employee feeling of attaching and committing with the organization. Dewettinck and Van Amejide (2011) argued that intentions to stay affects the attitudes and behavior of the employees. If an employee considers performing his duties as a virtue and loves his job, then he does not need too much external motivation to improve performance. Intrinsic motivation remains a moderate to strong predictor of performance regardless of whether incentives are present (Cerasoli and others, 2014). Rogstadius and others (2011) suggested that intrinsic motivation can indeed improve the quality of workers' output. Therefore, this study proposes

Hypothesis 1: Intrinsic motivation has positive impact on job satisfaction.

Employees who are highly motivated for advancement tend to be highly achievement-oriented (Gamache and others, 2015). Consistently, Mafini and Dlodlo (2014) found moderate to strong correlations between the extrinsic motivation factors and job satisfaction. Similarly, Edrak and others, (2013) suggested that there are significant and positive relationship between extrinsic motivations and job satisfaction while extrinsic motivation is identified as the predictor for job satisfaction. Therefore, this study proposes

Hypothesis 2: Extrinsic motivation has positive impact on job satisfaction.

If employees are satisfied with their job, they will be more willing to stay with the company (Leip & Stinchcomb, 2013). Job satisfaction has a significant effect on the intention to stay (Eslami & Gharakhani, 2012). Therefore, this study proposes

Hypothesis 3: Job satisfaction has positive impact on intention to stay.

3.2 Research Framework

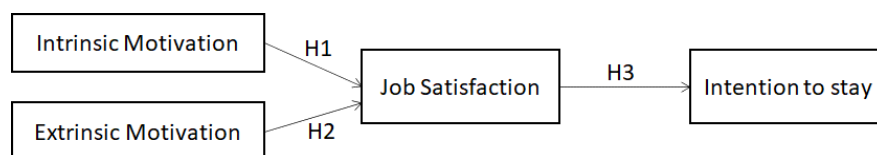


Figure 1 Research Framework

4. Research Methodology

The current study is quantitative research. This study distributed 600 questionnaires to employees of the selected telecommunication company in Yunnan province, China. The study collected the data from 240 respondents which is adequate sample size for known population of 600 employee according to Yamane (1967) with 95% level of precision.

4.1 Research Instrument

The distributed questionnaires include measurement items of related variables which are intrinsic motivation, extrinsic motivation, job satisfaction, and intention to stay. They were measured on 5-point Likert scale (1 for Strongly Disagree and 5 for strongly Agree). For intrinsic motivation, six measurement items were

adopted from Arvey and others, (1989). For example, “My job keeps me busy all the time.” For extrinsic motivation, six measurement items were adopted from Arvey and others, (1989). For example, “My boss is able to handles people properly.” For job satisfaction, five measurement items were adopted from Brayfield & Rothe (1951). For example, “At this very moment, I am enthusiastic about my work.” For intention to stay, three measurement items were adopted from Mowday and others, (1984). For example, “I do not intend to quit my job”.

Validity and Reliability Test

The current study uses back translation technique from English questionnaire to Chinese questionnaire and afterward, translate from Chinese to English to confirm the content validity. Confirmatory factor analysis suggested that the loadings of all measurement items of all constructs were above 0.5 except item 1 of intrinsic motivation which stated that “My job keeps me busy all the time” which was found that loading value has value lower than 0.5. Therefore, it was removed from the model. In addition, the average variances extracted (AVEs) for Intrinsic motivation (0.490), Extrinsic motivation (0.647), Job satisfaction (0.802), and Intention to stay (0.749) were above 0.5. Hence, this study found that intrinsic motivation, extrinsic motivation, job satisfaction and intention to stay have convergent validity (Fornell & Larcker, 1981). In addition, the composite reliability and Cronbach’s alpha of all four variables exceeded 0.6, showing internal consistency for reliability.

Table 1 Validity and Reliability Test

	Loadings	Cronbach’s Alpha	Composite Reliability	Average Variance	Number of Items
Intrinsic Motivation	0.514-0.832	0.908	0.912	0.490	11
Extrinsic Motivation	0.746-0.844	0.916	0.917	0.647	6
Job Satisfaction	0.731-0.951	0.949	0.953	0.802	5
Intention to Stay	0.763-0.918	0.892	0.899	0.749	3

4.4 Data Collection

This study distributed 600 self-administered questionnaires to employees of the selected telecommunication company in Yunnan province, China. The study collected the data from 240 respondents which is adequate sample size for known population of 600 employee according to Yamane (1967) with 95% level of precision.

4.5 Data Analysis

This study use multiple linear regression to test hypothesis 1 and hypothesis 2 while using simple linear regression to test hypothesis 3 at 95% confidence level.

5. Research Findings

This study found that 51% (123) of respondents were male and 49% (117) were female. Most of respondents (39%, 94) were 26-33 years old. For education, 68% (164) of respondents obtained bachelor degree. For job position, 51% (123) of respondents were entry level. For working experience at the company, 29% (69) of respondents had 2-5 years of working experience. For department, 44% (107) of respondents were in sale department.

Multiple linear regression confirmed that intrinsic motivation and extrinsic motivation have positive impact on job satisfaction ($p = 0.00$). Thus, hypothesis 1 and hypothesis 2 are supported. The coefficient of intrinsic motivation in the regression equation is 0.345. Therefore, the increase of intrinsic motivation for 1 unit would lead job satisfaction to increase by 0.345 while holding other variables in the model constant. Consistently, the coefficient of extrinsic motivation in the regression equation is 0.646. Therefore, the increase of extrinsic motivation for 1 unit would lead job satisfaction to increase by 0.646 while holding other variables in the model constant.

For hypothesis 3, simple linear regression confirmed that job satisfaction has positive impact on intention to stay ($p=0.00$). The coefficient of job satisfaction in the regression equation is 0.786. Therefore, the increase of job satisfaction for 1 unit would lead intention to stay to increase by 0.786 while holding other variables in the model constant. This study emphasizes the importance of job satisfaction to achieve desired performance outcomes. The employee's intention to stay is determined through the level of satisfaction that the organizations has provided (Roehl & Swerdlow, 1999). The study presented here leads us to believe that how an enterprise treats its employees would affect its performance.

Table 2 Summary of hypotheses testing

	P-value	Adj. R-square	β	Result
H1: Intrinsic motivation \rightarrow Job satisfaction	0.000	0.623	0.345	Supported
H2: Extrinsic motivation \rightarrow Job satisfaction	0.000	0.623	0.646	Supported
H3: Job satisfaction \rightarrow Intention to stay	0.000	0.457	0.786	Supported

6. Discussion

This study set out to look at the relationship among intrinsic motivation, extrinsic motivation, job satisfaction, and intention to stay. All hypotheses are supported. This study confirmed hypotheses 1 that intrinsic motivation has positive impact on job satisfaction. Intrinsic motivation remains a moderate to strong predictor of performance regardless of whether incentives are present (Cerasoli and others, 2014). This study confirmed hypotheses 2 that extrinsic motivation has positive impact on job satisfaction. The findings are aligned with Edrak and others, (2013) that suggested that there are significant and positive relationship between extrinsic motivations and job satisfaction while extrinsic motivation is identified as the predictor for job satisfaction. Extrinsic motivation is instrumental in nature and is done for the purpose of achieving other outcomes (Legault, 2016).

This study confirmed hypotheses 3 that job satisfaction has positive impact on intention to stay. The finding is supported by social exchange theory. If employees are satisfied with their jobs, then they will be more willing to stay (Leip & Stinchcomb, 2013). Job satisfaction has a significant effect on the intention to stay (Eslami & Gharakhani, 2012).

In addition, this study found that coefficient of extrinsic motivation is higher than that of intrinsic motivation. This might be a result of China policy that shift from the period of demographic dividend to the period of demographic burden. On the other hand, Confucianism emphasizes the mean, and no one is willing to take risks to start a business. In addition, the epidemic has led to the closure of many small and medium-sized enterprises, and there are many people waiting for employment. Under the condition of constant living expenses, the remuneration is constantly decreasing, so everyone is pursuing the actual remuneration, which is the extrinsic motivation (Zhihu, 2021)

7. Managerial Implication

This study found that intrinsic motivation that this company should focus is empowerment to make decision. The so-called freedom of judgment of employees is to a large extent the freedom of decision-making of employees. The freedom of decision-making and judgment of employees is an important manifestation of employees' participation in organizational management, which can make them feel the trust of their superiors and experience their own interests and organization. Develop a strong sense of responsibility arising from the close relationship, and at the same time, employees will get a sense of accomplishment because of their freedom of judgment and decision-making freedom on major issues at work, thereby being motivated and providing a guarantee for the organization to achieve its goals.

Due to the advancement of corporate system reforms and the overall progress of the global economy, Chinese companies have gradually stepped into the standardized track of employee participation in management. There are two basic ways: direct participation and indirect participation. Direct participation in management means that all employees participate in the entire process of business management decision-making, judgment, and operation. However, this method may reduce the efficiency of decision-making and increase the cost of decision-making. Therefore, this form is generally suitable for small-scale employees. As for large enterprises which have a large number of employees, they can only apply for indirect participation in management. All employees or departmental employees can delegate their representatives to participate in enterprise management in a certain way. In this way to achieve their own freedom of judgment.

This study found that extrinsic motivation that this company should focus is the balance of compensation and job contribution. Employees may feel that workload is not directly proportional to income. In fact, this kind of unfairness may be the most common phenomenon in enterprises because every company has its own profit balance point. Once it exceeds, it means that the company will suffer losses. If it does not create greater value for the company, the company will not easily raise its salary. In order to recruit more excellent talents, the

company should offer higher salaries because working in such a large company, employees' competition will be quite intense and replaceable.

In fact, to break this situation, the initiative is still in the hands of the boss. It is undeniable that there are some employees who want to earn more with less work, but most employees still want to get higher returns through their hard work, so objectively the high salary can indeed stimulate the employees' sense of responsibility and enthusiasm, so that they can cherish their job even more. For employee who do not have improvement, the company can completely discard them and save the money to more valuable employees. Good employees will work harder if they have a satisfactory income, and adopt this method of rewarding the fittest. A benign situation will be formed, the loyalty of employees will be significantly improved, creating more value and benefit.

This study found that work enjoyment for job satisfaction should be emphasized. China has a large population and huge work pressure. Especially in large enterprises, competition is very fierce. There are hundreds of people competing for a job. Many employees cannot relax after they get a job because there is a risk of being replaced at any time. Employees cannot find fun at work. Some company might focus on sales while others focus on branding and corporate culture. If employees want to find enjoyment at work, the company must strengthen the establishment of corporate culture. Companies can organize outdoor activities and holiday activities from time to time. Use it to promote employees' enthusiasm and fun at work. In addition, the core of the organization is people, hence, the company should establish a good communication channel between superiors and subordinates while listen to the demands of employees.

This study found that some employee might want to quit their job. The main reason for employees wanting to leave is that competition in large companies is very fierce and it is very difficult for employees to promote. Employment environment are full of pressure and competition. While excessive competition has occurred in a certain field, it causes people to enter a state of mutual internal friction. Some employees work overtime unconditionally in order to get the boss's attention. So, under the influence of involution, even the employees of large companies will compare weaker companies with themselves. If there is something more suitable for them, they will have the intent of leaving and quitting the company. So, the company should establish a reasonable and legal corporate salary system, clarify the overtime system, and establish a good corporate culture. It is more necessary to provide employees with reasonable promotion channels and regular training and learning for employees. The involution cannot be completely eliminated, and even the best companies will have to face employees leaving, we can use the above methods to minimize the impact of involution on employee retention, thereby reducing the turnover rate.

8. Suggestion for future research

This study has some limitations. The first limitation is the number of responses obtained from the survey was rather small. A larger number of responses would probably yield a more accurate finding. In addition, since this study only investigates the company employees in Yunnan province in China, hence the findings and conclusions drawn from this research are representative of that company employees, and the findings may not

generalize to other geographic regions, industries or cultures. Future research should include employee empowerment and employee engagement in the analysis. Further study might explore the effect of corporate culture as moderator.

9. References

- Arvey, R. D., Bouchard, T. J., Segal, N. L., & Abraham, L. M. (1989). Job satisfaction: Environmental and genetic components. *Journal of applied psychology*, 74(2), 187.
- Aziri, B. (2011). Job satisfaction: a literature review. *Management Research & Practice*, 3(4).
- Blau, P. M. (1964). *Exchange and power in social life*. John Wiley & Sons, New York.
- Brayfield, A. H., & Rothe, H. F. (1951). An index of job satisfaction. *Journal of applied psychology*, 35(5), 307.
- Cerasoli, C. P., Nicklin, J. M., & Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: a 40-year meta-analysis. *Psychological bulletin*, 140(4), 980.
- Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of management*, 31(6), 874-900.
- Dewettinck, K., & Van Ameijde, M. (2011). Linking leadership empowerment behaviour to employee attitudes and behavioural intentions. *Personnel Review*.
- Edrak, B. B., Yin-Fah, B. C., Gharleghi, B., & Seng, T. K. (2013). The effectiveness of intrinsic and extrinsic motivations: A study of Malaysian Amway Company's direct sales forces. *International Journal of Business and Social Science*, 4(9), 96-103.
- Eslami, J., & Gharakhani, D. (2012). Organizational commitment and job satisfaction. *ARPN journal of science and technology*, 2(2), 85-91.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 18(1), 39-50.
- Gamache, D. L., McNamara, G., Mannor, M. J., & Johnson, R. E. (2015). Motivated to acquire? The impact of CEO regulatory focus on firm acquisitions. *Academy of Management Journal*, 58(4), 1261-1282.
- Gopalan, V., Bakar, J. A. A., Zulkifli, A. N., Alwi, A., & Mat, R. C. (2017, October). A review of the motivation theories in learning. In *AIP Conference Proceedings*, 1891(1), p. 020043. AIP Publishing LLC.
- Herzberg, F. (1968). One more time: How do you motivate employees? *Harvard Business Review*, 40(1), 53-62.
- Herzberg, F. (1976). *The managerial choice: To be efficient and to be human*. Homewood, IL: Dow Jones-Irwin.
- Herzberg, F. (1984). *Herzberg on motivation*. Cleveland, OH: Penton Media Inc.
- Hoppock, R. (1935). *Job satisfaction*. New York and London: Harper and Brothers..
- Hyun, S., & Oh, H. (2011). Reexamination of Herzberg's two-factor theory of motivation in the Korean army foodservice operations. *Journal of Foodservice Business Research*, 14(2), 100-121.
- Katt, J. A., & Condly, S. J. (2009). A preliminary study of classroom motivators and de-motivators from a motivation-hygiene perspective. *Communication Education*, 58(2), 213-234.

- Lambert, E., & Hogan, N. (2009). The importance of job satisfaction and organizational commitment in shaping turnover intent: A test of a causal model. *Criminal Justice Review*, 34(1), 96-118.
- Legault, L. (2016). The need for autonomy. *Encyclopedia of Personality and Individual Differences*, 1-3.
- Legault, L. (2020). Intrinsic and extrinsic motivation. *Encyclopedia of personality and individual differences*, 2416-2419.
- Leip, L. A., & Stinchcomb, J. B. (2013). Should I stay or should I go? Job satisfaction and turnover intent of jail staff throughout the United States. *Criminal Justice Review*, 38(2), 226-241.
- Lorincova, S., starchon, P., Weberova, D., Hitka, M., & Lipoldova, M. (2019). Employee motivation as a tool to achieve sustainability of business processes. *Sustainability*, 11(13), 3509.
- Mafini, C., & Dlodlo, N. (2014). The relationship between extrinsic motivation, job satisfaction and life satisfaction amongst employees in a public organisation. *SA Journal of Industrial Psychology*, 40(1), 1-13.
- Mohlala, J. G. H. (2011). *Employee retention within Standard Bank Group IT*. University of Johannesburg (South Africa). ProQuest Dissertations Publishing, 2011. 28376477.
- McLeod, S. (2007). Maslow's hierarchy of needs. *Simply psychology*, 1, 1-8.
- Mowday, R. T., Koberg, C. S., & McArthur, A. W. (1984). The psychology of the withdrawal process: A cross-validation test of Mobley's intermediate linkages model of turnover in two samples. *Academy of management Journal*, 27(1), 79-94.
- Naim, M. F., & Lenkla, U. (2016). Knowledge sharing as an intervention for Gen Y employees' intention to stay. *Industrial and Commercial Training*.
- National Bureau of Statistics. (2018). *The service sector has grown rapidly in the course of reform and opening up, accounting for half of the national economy*. Retrieved January 10, 2021 from: http://www.stats.gov.cn/zjtj/ztfx/ggkf40n/201809/t20180910_1621829.html.
- Roehl, W. S., & Swerdlow, S. (1999). Training and its impact on organizational commitment among lodging employees. *Journal of Hospitality & Tourism Research*, 23(2), 176-194.
- Rogstadius, J., Kostakos, V., Kittur, A., Smus, B., Laredo, J., & Vukovic, M. (2011, July). An assessment of intrinsic and extrinsic motivation on task performance in crowdsourcing markets. In *Fifth International AAAI Conference on Weblogs and Social Media*
- Sandhya, K., & Kumar, D. P. (2011). Employee retention by motivation. *Indian Journal of science and technology*, 4(12), 1778-1782.
- Sansone, C., & Harackiewicz, J. M. (Eds.). (2000). *Intrinsic and extrinsic motivation: The search for optimal motivation and performance*. Elsevier.
- Yamane, T. 1967. *Statistics, An Introductory Analysis*, 2nd Ed., New York: Harper and Row.
- Zhihu. (2021). *Why is the inner scroll a unique social phenomenon in China*. Retrieved August 14, 2021 from <https://zhuanlan.zhihu.com/p/373962773>

**LOGISTICS COSTS MANAGEMENT WITH ACTIVITY BASED COSTING
FOR THE COMMUNITY ENTERPRISE WOVEN FABRICS OF BAN
HUI SAI, CHOM THONG DISTRICT, CHIANGMAI PROVINCE**

Narumon Kumpong

Department of Accounting, Faculty of Business Administration and Liberal Arts,

Rajamangala University of Technology Lanna.

E-mail: Narumon.Kumpong@gmail.com

Niwet Sriwichai

The Office of Academic Affairs and Registration,

Rajamangala University of Technology Lanna.

E-mail: sriwichai.nivet@gmail.com

Chayanisa Khumsillaprapa

Independent Researcher

E-mail: chayanissecret19@gmail.com

ABSTRACT

This research aims define Objectives of the research 1. Logistics Activity 2. Costs related to logistics activities 3. Analyze logistics costs with activity based costing system for The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province as in contents and the research results found that 1. Logistics costs in each activity 2. Get a way to reduce logistics costs from non value-added activities and unexploited costs. The research model is qualitative research. The population in this study was members of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province. The selection of a specific sample was based on 1 member who working in a sales department, 1 purchasing department, 1 production department, 1 warehouse department, 1 administrative department (clerk), 1 chairman and Total 6 persons. The in-depth interview was used as a tool for collecting logistics activity data, Cost of factors or Resources (Input) used in 4 types of logistics activities and workload information of each department. Calculate the proportion of logistics operations of each department and Allocate the cost of each department into logistics activities.

The results showed that The logistics activities of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province consisted of 9 activities as follows: Order Processing, Demand Forecasting, Inventory Management, Procurement, Material Handling, Packaging, Transportation, Logistics Communications, Reverse Logistics. Cost of factors or resources (Input) used in 3 types of logistics

activities: 1) Personnel costs are wages 2) Machinery and Equipment costs are Maintenance, Depreciation, Fuel Cost 3) Working materials and consumables costs are Paper cost, Other office supplies, Telephone service charges, Internet Fee, Water Charges, Electricity Charges. After analyzing logistics costs with Activity Based Costing system, it was revealed that The activities with the highest logistics costs were the Material Handling. Followed by Packaging, Logistics Communications, Order Processing, Transportation, Inventory Management, Procurement, Demand Forecasting respectively. The activities with the least logistics costs were Reverse Logistics. Therefore, this research proposes a way to reduce the cost of Material Handling.

Keywords: Management, Logistics Costs, Activity Based Costing

1. Introduction

The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province, which produce hand-woven cotton and various fabrics, including hand-woven fabrics with polished patterns, shawls, puffed-up scarves, men's shirts, women's shirts, dresses, cotton pants. Group members have experience in producing and designing new patterns. Moreover, they can design and create the trendy modern patterns from the customer's demand. In addition, the product has received community product standards. Therefore, the group's products have a wider market. It is interesting to customers both inside and outside the community including foreign customers. All activities related to transportation or logistics play an important role in the group's logistics and customer service management to reduce costs, transportation time, problems that will arise using the least cost.

The important activities of logistics such as the selection of packaging to be used to packing goods, Loading and unloading materials inside a factory or in a warehouse, Transporting goods between locations both at home and abroad, Warehouse management such as product planning or where to set up a warehouse, Inventory management system for efficient product turnover or distribution, Management of raw material suppliers to obtain raw materials that are of quality and sufficient to meet the demand in a timely manner. Determining the distribution location for products distribution evenly, production control systems etc. It is imperative to measure the efficiency resulting from operations in logistics activities, especially the costs spent on logistics activities by using modern costing tools in accordance with each activity, known as Activity Base Costing System (Activity-Based Costing : ABC) which will increase the accuracy of product cost calculations. Optimizing decision-making and cost control to create excellence. Able to know the logistics cost structure incurred from various activities. This can lead to decisions to reduce non value-added activities. Including improving various operating processes.

To raise the standard of logistics cost management, this research will study logistics activities and costs associated with logistics activities, Emphasis is placed on the importance of costing through the application of the activity based costing system in the logistics activities of enterprises. Help to know the logistics costs of community enterprises and get a way to reduce logistics costs reflect the activity, Actual operations and logistics costs. It is a knowledge transfer suitable for community enterprises that can be used for further use.

2. Research Objective

1. To study Logistics Activities 2. To study Costs related to logistics activities 3. To Analyze logistics costs with activity based costing system for The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province.

3. Literature Review

3.1 Theory, Concept and Related Research

Lambert & Ellram (1998) has given the meaning of Logistics as the process of planning, operating and controlling effectively with low cost mobility. And storage of raw materials, goods in process, processed goods and related information from the point of production to the point of consumption to meet the needs of customers.

Suthiwatanaruput et al. (2004) has defined logistics management as the process of planning, implementing and controlling the efficiency and effectiveness of the movement, storage of goods services and information from the beginning to the point of use with goals that are in line with the needs of consumers. This includes the movement of goods and services in both the manufacturing and service sectors. It also includes final handling, elimination, transformation, or product recovery. And logistics have a higher scope of responsibility, such as packing raw materials once they reach their destination and removal of old equipment that is no longer used. Therefore, it is not only related to the production process but also related to every business.

Council of Supply Chain Management Professional (CSCMP) (2006) defined as Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements. Logistics management activities typically include inbound and outbound transportation management.

Panomyong (2004) divided logistics activities into 13 activities. Effectively managing all 13 activities will help businesses have competitive advantages in terms of quality, price and time to meet customer needs better. The activities consist of 1) Customer Service 2) Demand Forecasting 3) Logistics Communications 4) Inventory Management 5) Material Handling 6) Order Processing 7) Part and Service Support 8) Plant and Warehouse Site Selection 9) Procurement 10) Packaging 11) Reverse logistics 12) Transportation 13) Warehouse and Storage

Sukhotu (2015) said that collecting data and calculating logistics costs of each activity. Will classify the resources used in the activity can be classified into 4 types: personnel resources, areas, tools and equipment and working materials or consumables. To calculate the cost of activities, it is necessary to know the costs related to the target operating site by gathering information from various sources. The information needed to calculate activity costs consists of 1) Activity costs classified by type of resources 2) The time required for labor to perform the task 3) The criteria for distributing costs across activities.

Kaplan & Cooper (1988) supported the idea of an activity-based costing system in theory and practical application. By dividing the operations of the organization into various activities as well as the time spent in each

activity. It can be summarized as follows: 1) Activity Analysis 2) Identification of Activity Costs 3) Identification of Performance Metrics, unit cost of results, time spent, and the quality of the results 4) Identification of the relevance of results in each activity and cost drivers. This is information to control and reduce the cost of the business. It is also used as a base for calculating the cost of activities that occur. 5) Specifying the cost of activities and what will be costing An activity-based costing system is a method that helps to calculate the cost of an item or product more accurately than a conventional accounting-based costing system.

Onsanit (2012) have studied Reduction cost analysis of using Activity Based Costing (ABC) case study: Johnson Control & Summit Interiores LTD. The guideline in cost reduction in this research are proposed 3 approaches: reducing resource cost, reducing cost of plastic packaging, and reducing cost by integrating activities, and all these will enable the company reduce the cost and increase profits.

Thoucharee et al. (2015) have studied Literature Review on an Analysis and Reduction Logistics Cost of SMEs in Thailand. The review of research found each industrial SMEs in Thailand have high logistics cost varies by each industry, which approach to reducing these costs is based on information from the analysis of logistics costs. There are factors that affect the cost of logistics is highly valued and management decisions to reduce these costs. The top management of small and medium enterprises are key.

Khuptawatin et al. (2016) have studied The Study of Logistics Costs with Activity Based Costing System: A Case Study of Pineapples Farmers in Chaiyaphum Province. The study found that the average logistics cost of farmers who produce representing 16.49 percent of total sales. The inbound logistics cost from the supply side were divided in to four parts: the highest cost was procurement cost which was 14.66 percent and the cost of moving goods within the area was 1.33 percent, freight costs was 0.34 percent and inventory and warehouse management cost was 0.16 percent. Producer cluster of pineapples was the way for logistic cost reduce, production planning on supported by government organization that involved and distribution center setting.

Nukchop et al. (2017) have studied The Analysis of Production and Logistics Cost for Melientha Suavis: Case Study of Good Agriculture Practices Group In Saraburi Province. Researchers found that logistics occurring in before-delivery activities were high employment costs. Thus, the guidelines for cost reduction using ECRS technique which apply C: Combine. In other words, the merger of employees' workload in production collection at a production and storage center was able to reduce the labor employment.

4. Research Methodology

4.1 Research Design

This research is Qualitative Research. Use the method to study the relevant documents and In-depth interviews as a tool for data collection as follows:

4.1.1 Study logistics activities.

4.1.2 Specify cost of factors or resources (Input) used in 4 types of logistics activities: 1. Personnel costs 2. Area costs 3. Machinery and equipment costs 4. Working materials and consumables costs

4.1.3 Collect data on the workload information of each department.

4.1.4 Calculate activity based costing.

4.1.5 Comparative analysis of the results obtained from the study. Conclusion and Discussion of Study Results.

4.2 Population and Sample

4.2.1 Population: 33 members of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province.

4.2.2 Sample: Determined the sample by using a specific method based on the members who working in Sales department 1 person, Purchasing department 1 person, Manufacturing department 1 person, Warehouse department 1 person, Administrative department 1 person, Chairman group 1 person.

4.3 Research Instrument

The research instrument was an in-depth interview as a tool for collecting logistics activity data which is built according to the objectives and conceptual framework divided into 2 parts as follows:

Part 1 Interview Form about structure and operational procedures.

Part 2 Interview Form for Logistics Activities, Cost of factors or resources (Input) used in logistics activities and Workload information of each department.

4.4 Data Collection

4.4.1 Primary Data collected by in-depth interview form from Sales department 1 person, Purchasing department 1 person, Manufacturing department 1 person, Warehouse department 1 person, Administrative department 1 person, Chairman group 1 person, total 6 people.

4.4.2 Secondary Data were studied from books, articles, academic texts, documents, information researched from electronic publications and related research.

4.5 Data analysis

When knowing the Logistics Activities, Cost of factors or resources (Input) used in logistics activities and Workload information of each department will be used to calculate the proportion of logistics operations of each department and allocate the cost into logistics activities.

5. Research Findings

5.1 Results of the study on logistics activities of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province. When divided into 13 logistics activities according to the concept of Ruthi Panomyong (2004). It was found that there were 9 logistics activities, namely 1. Order Processing 2. Demand forecasting 3. Inventory management 4. Procurement 5. Material Handling 6. Packaging 7. Transportation 8. Logistics Communications 9. Reverse Logistics which has various departments related and there are sub-activities that are performed in each department as shown in Table 1 as follows

Table 1 Logistics activities of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province.

Key Logistics Activities		Relevant Department		Sub-activities
A	1. Order Processing	A01	Sales	Receive orders from customers. / Make sales schedules. / Summarize the sales schedule to send to the production work to plan the production.
		A02	Manufacturing	Plan the production according to the order quantity.
B	2. Demand Forecasting	B01	Sales	Estimated sales from the previous month's data. / Collect sales from orders from customers.
		B02	Purchasing	Forecast the quantity of raw materials and other materials related used in production.
		B03	Manufacturing	Forecast data from sales to plan production.
C	3. Inventory Management	C01	warehouse	The amount of inventory and storage of inputs and products during production finished product.
		C02	Administrative	Cost of in-stock products (inventory).
D	4. Procurement	D01	Purchasing	purchasing raw materials.
		D02	Administrative	Calculate the cost of procurement activities.
E	5. Material Handling	E01	Manufacturing	moving raw materials in-process products and finished products.
F	6. Packaging	F01	Manufacturing	Packing finished products to wait for delivery. / Pick up of customers.
G	7. Transportation	G01	Sales	Delivery of finished products.
		G02	warehouse	Test the products to be shipped and counting products that are ready to be delivered to customers.
H	8. Logistics Communications	H01	Sales	Get order information from customers and summarized forward to the production work to plan the production.
		H02	Purchasing	Information of manufacturer. / Supply of raw materials.
		H03	Manufacturing	Product quantity information.
		H04	warehouse	Stock information (inventory).
		H05	Administrative	Information on communication costs of every job.
I	9. Reverse Logistics	I06	Sales	Get notified of returned products due to damage and coordinate with the product supplier.

5.2 Results of the study on Costs related to logistics activities for The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province. When collecting costs related to logistics activities By categorizing the resources that are used in 4 types of activities according to the concept of Vatcharapol Sukhotu (2015). It was found that Cost of factors or resources (Input) used in 3 types of logistics activities: 1) Personnel costs are wages 2)Machinery and Equipment costs are Maintenance, Depreciation, Fuel Cost 3) Working materials and consumables costs are Paper cost, Other office supplies, Telephone service charges, Internet Fee, Water Charges, Electricity Charges as shown in Table 2 as follows

Table 2 Costs related to logistics activities of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province.

Cost of factors or resources (Input) related to logistics activities			Average per month (Baht)	Total cost
1. Personnel costs	Wages	Sales	8,000	201,000
		Purchasing	8,000	
		Manufacturing	153,000	
		warehouse	16,000	
		Administrative	16,000	
2. Machinery and Equipment costs	Maintenance	Computer	100	22,349.99
		Printer	50	
		Pickup truck	200	
	Depreciation	Computer	300	
		Printer	33.33	
		Pickup truck	6,666.66	
	fuel cost		15,000	
3. Working materials and consumables costs	Paper cost		1,100	10,100
	Other office supplies		200	
	Telephone service charges		2,000	
	Internet Fee		800	
	Water charges		1,000	
	Electricity charges		5,000	
Total cost			233,449.99	

5.3 Results of the Analyze logistics costs with activity based costing system for The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province. When analyzing logistics costs using an activity-based costing system based on the concept of Kaplan & Cooper (1988). Calculate the proportion of logistics operations of each department and allocate the cost into logistics activities. It was found that there were logistics costs in 9 activities as follows: 1. Order Processing 11,143.53 baht 2. Demand forecasting 6,402.32 baht 3. Inventory management 9,173.22 baht 4. Procurement 8,993.61 baht 5. Material Handling 67,219.75 baht 6. Packaging 19,679.26 baht 7. Transportation 9,623.41 baht 8. Logistics Communications 15,386.60 baht 9. Reverse Logistics 1,924.66 baht. Total logistics costs for 9 activities amounting to 149,546.36 baht per month, representing 64% of the Costs related to logistics activities, according to Table 3 as follows

Table 3 Analyze logistics costs with activity based costing system of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province.

Key Logistics Activities	Sub-activities	Personnel costs	Machinery and Equipment costs	Working materials and consumables costs	Activity Based Cost (Baht)	% Logistics costs
1. Order Processing	A01	1,000.00	60.42	243.48	11,143.53	7.45%
	A02	9,562.50		277.13		
		10,562.50	60.42	520.61		
2. Demand Forecasting	B01	500.00	16.10	107.99	6,402.32	4.28%
	B02	500.00		35.68		
	B03	5,094.90		147.65		
		6,094.90	16.10	291.32		
3. Inventory Management	C01	8,000.00		594.40	9,173.22	6.13%
	C02	532.80		46.02		
		8,532.80	0.00	640.42		
4. Procurement	D01	6,000.00		845.86	8,993.61	6.01%
	D02	2,000.00		147.75		
		8,000.00	0.00	993.61		
5. Material Handling	E01	57,357.00	8,199.99	1,662.76	67,219.75	44.95%
6. Packaging	F01	19,125.00	0.00	554.26	19,679.26	13.16%
7. Transportation	G01	2,000.00	5,466.66	65.25	9,623.41	6.44%
	G02	2,000.00		91.50		
		4,000.00	5,466.66	156.75		
8. Logistics Communications	H01	1,000.00	60.42	243.48	15,386.60	10.29%
	H02	500.00	30.20	89.86		
	H03	4,467.60	14.14	129.47		
	H04	2,000.00	60.42	91.50		
	H05	6,000.00	181.25	518.26		
		13,967.60	346.43	1,072.57		
9. Reverse Logistics	I06	500.00	1,366.67	57.99	1,924.66	1.29%
Total Logistics costs		128,139.80	15,456.27	5,950.29	149,546.36	100%

6. Discussion

This research has issues to discuss the results as follows:

6.1 The analyze logistics costs using the activity based costing system, it was revealed that The activity with the highest logistics costs is the Material Handling. Next, in order from greatest to least, are: Packing Logistic Communication Order Processing Transportation Inventory Management Procurement Forecasting and activities with the least logistics costs are Reverse Logistics consistent with the research of Aekachai Khuptawatin et al. (2016) have studied The Study of Logistics Costs with Activity Based Costing System: A Case Study of Pineapples Farmers in Chaiyaphum Province. The research results show that the cost of sourcing inputs is considered to be the highest cost. Followed by the cost of moving local produce transportation costs, Cost of

warehousing and inventory, respectively. It can be seen that the cost of Material Handling and the cost of moving local produce transportation costs. It is an activity with high logistics costs at the top, which should find ways to reduce such costs in accordance with the research of Sedthapoom Thoucharee et al. (2015) have studied Literature Review on an Analysis and Reduction Logistics Cost of SMEs in Thailand The review of research found each industrial SMEs in Thailand have high logistics cost varies by each industry, which approach to reducing these costs is based on information from the analysis of logistics costs. There are factors that affect the cost of logistics is highly valued and management decisions to reduce these costs. The top management of small and medium enterprises are key.

6.2 Reducing logistics costs of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province. From the analysis of logistics costs using the activity-based costing system. It made me realize that the activities with the highest logistics costs were Material Handling accounted for 44.95% of total logistics costs which focuses on personnel costs such as wages accounts for 85.33% of logistics costs in all Material Handling. When considering the working hours spent on Material Handling activities, they account for 60% of the hours worked in manufacturing logistics activities. Therefore, the way to reduce the cost of Material Handling activities is to have join production planning among operational members. Organizing the movement of raw materials in-process products and various finished products to suit. The distance traveled is reduced as much as possible. And try to reduce the number of moving as much as possible to save labor and labor costs. Because every time there is a movement there is a cost incurred from the movement. Also consider what activities can be carried out at the same time or with a combination of labor. Therefore, if the cost of this activity can be reduced, the cost of production will also be reduced. which is consistent with the research of Sasithorn Onsanit (2012) have studied Reduction cost analysis of using Activity Based Costing (ABC) case study: Johnson Control & Summit Interiores LTD. The guideline in cost reduction in this research are proposed 3 approaches: reducing resource cost, reducing cost of plastic packaging, and reducing cost by integrating activities, and all these will enable the company reduce the cost and increase profits. And consistent with the research of Aekachai Khuptawatin et al. (2016) have studied The Study of Logistics Costs with Activity Based Costing System: A Case Study of Pineapples Farmers in Chaiyaphum Province. The research team has proposed a way to reduce logistics costs in the management of the supply chain of farmers in the movement of produce in the field as follows: Planning for production and harvesting together as a group within the members to rely on the labor within the members. To help reduce the cost of relying on external labor. And consistent with the research of Paradee Nukchop et al. (2017) have studied The Analysis of Production and Logistics Cost For Melientha Suavis: Case Study of Good Agriculture Practices Group In Saraburi Province. The research team has proposed a way to reduce the cost of producing Melientha Suavis in pre-shipment activities. In terms of employing workers that are high and not worth it. The researchers applied the ECRS principle by combining the workload of the workers in the productivity activities at a center with one worker who is responsible for driving the car to collect the Melientha Suavis of the members of the group. Overall, the workload of the said employee in order to continue to perform

duties in pre-delivery activities that are continuous activities. As a result, pre-delivery activities that employ 2 workers can reduce the number of workers by 1 person, which can reduce the employment of workers.

7. Suggestion

7.1 Suggestions for applying the research results

The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province should be managed Logistics costs in Material Handling as follows:

(1) Should reduce the number of times to move raw materials from the production source to the weaving factory less. This will reduce working hours and reduce the cost of fuel in another way.

(2) The textile factory layout should be redesigned to reduce the distance and reduce the amount movement of raw material, in-process products and finished products less. Originally, the average working hours of 3 hours per day were reduced to an average of 1.5 hours per day.

(3) The workload should be included in the ongoing activities, namely: 1. Moving raw materials in-process products and finished products. 2. Test the products to be shipped and counting products that are ready to be delivered to customers. 3. The amount of inventory and storage of inputs and products during production finished product. It will reduce the number of workers by 2 persons.

If these three items can be managed, the cost of Material Handling activities will be reduced to 23.52% of the total logistics cost.

7.2 Suggestions for future research

This study focus on the study of The Community Enterprise Woven Fabrics only. Therefore, in the next research should study other industries or large corporations to achieve complete activities and costs.

8. Acknowledgment

This research has been successfully accomplished. Courtesy of Ms. Nutrada Kaewchompoo, the group's chairman, who gave up his time and useful advice. As a result, this research was completed.

In addition, the research team would like to thank member of The Community Enterprise Woven Fabrics of Ban Huai Sai, Chom Thong District, Chiangmai Province, who answered the interview form for this research.

9. References

- Council of Supply Chain Management Professional (CSCMP). (2006). *Logistics and Supply Chain Management*. [Online]. Searched by 30th September 2021, From: <https://pairach.com/supplychaindictionary/logisticsandscm>.
- Kaplan, R. S. & Cooper, R. (1988). *Measure cost right: Make the right decision*. Boston: Harvard Business.
- Khuptawatin et al. (2016). The Study of Logistics Costs with Activity Based Costing System: A Case Study of Pineapples Farmers in Chaiyaphum Province. *Panyapiwat Journal*, 8(3), 89-98.

- Lambert D.M., Stock J.R. & Ellrarm L.M. (1998). *Fundamentals of logistics management*. Boston: McGraw-Hill Irwin.
- Nukchop et al. (2017). The Analysis Of Production and Logistics Cost For Melientha Suavis: Case Study Of Good Agriculture Practices Group In Saraburi Province. *VRU Research and Development Journal Science and Technology*, 12 (3), 249-261.
- Onsanit S. (2012). Reduction cost analysis of using Activity Based Costing (ABC) case study: Johnson Control & Summit Interioros LTD. *Sripatum Journal Chonburi*, 9 (2), 115-122.
- Panomyong R. (2004). *Logistics management in Thailand. Reprint 1*. Bangkok: Good Time Publisher.
- Sukhotu V. (2015). *Logistics Management. Handout*. Faculty of Logistics and Digital Supply Chain, Naresuan University.
- Suthiwatanaruput et al. (2004). *Supply Chain Management and Logistics*. Reprint 1. Bangkok: Top McGraw-Hill.
- Thoucharee et al. (2015). Literature Review on an Analysis and Reduction Logistics Cost of SMEs in Thailand The review of research found each industrial SMEs in Thailand. *UBU Engineering Journal*, 8(2), 124-135.

**BLOCKCHAIN AS A KEY TO THE DEVELOPMENT OF THE EFFICIENCY
OF PUBLIC MANAGEMENT IN POLAND
POSITIVE EXPERIENCES OF THE COVID-19 PERIOD IN
THE OPERATION OF THE POLISH PUBLIC SECTOR**

Pawel Modrzynski, PhD

**Department of Organizational Innovation Management, Faculty of Management,
Bydgoszcz University of Science and Technology, Poland.**

E-mail: pawel.modrzynski@pbs.edu.pl

ABSTRACT

The management of the public sector is a subject to constant evolution and evaluation. The development of modern technologies, especially in the blockchain area, affects the effectiveness and dissemination of solutions implemented from the business sector to the public sector. An example of such tools are Shared Service Centres. Poland belongs to the countries where the commercial shared services sector is currently in a high development process. Legal changes that took place in Poland in 2016 made it possible for the public sector, including the local government, to use such tools to increase the efficiency and safety of the processes that are carried out. The use of blockchain technology in securing these processes proves the use of more and more innovative solutions in public sector management.

Keywords: Public Management, Blockchain, Shared Services Centres

1. Introduction

In the last few decades, there has been a lively discussion among researchers, specialists, and practitioners in the field of public management on the effectiveness of public and local government units. On the one hand, public sector units perform statutory tasks covering significant and sensitive social areas, such as education, health protection, safety, and social welfare. On the other hand, however, we cannot ignore the economic aspects – cost and effectiveness related to the spending of public funds. A public sector unit (including local government) aims to implement its statutory objectives while ensuring high-quality services and minimizing incurred expenses. When reviewing the literature in the field of public management, it is impossible not to mention the need for the public sector to implement good practices from the private sector (Osborne, 2010; Kisner, M., Vigoda-Gadot, E., 2017), or to focus on goals, for example cost reduction, and decentralization – known as New Public Management (Hood, 1991; Młodzik, 2015). The evolution of the public management approach is subject to continuous evaluation, the direction of which is set, among others, by technological

progress (Ulbrich, 2006). The development of modern technologies related to the digitization of document circulation, including financial, accounting, tax and payroll, and HR documents, making it possible to implement modern organizational solutions for the business sector by the public sector – namely the creation of shared service centres (Joha, A., Janssen, M., 2010; Modrzynski et al., 2018, Modrzynski, 2019, 2020). The main subject of this article is the use of blockchain technology¹ in the public sector in Poland, based on the example of shared service centres. First of all, in Poland, there have been significant legislative changes in recent years (Act of March 8, 1990). It enabled local government units or, more broadly, public units to implement the aforementioned organizational solutions successfully operating in the private sector, and to create shared service centres (Minnaar et al., 2013). Secondly, technological progress in computerization and digitization of the joint service processes has made it possible to significantly increase the quality, efficiency and safety of the services provided. Additionally, popularizing blockchain technology and using it to secure virtual transactions should be mentioned (Karaszewski, Modrzynski, Modrzynska, 2021; World Economic Forum, 2021; World Energy Council, 2017; Zikratov et al., 2017).

The first implementation of the blockchain technology by the shared services center took place in 2018 in the city of Torun, and the next one in the city of Elblag the following year. The period of the pandemic caused by the COVID-19 virus significantly impacted the global economy, running a business, and the functioning of economic entities, including public entities. The functioning of offices and public and local government institutions during pandemic resulted in reaching for solutions that were not previously used or were rarely used in the organization of work of both institutions and employees. The need to ensure the continuity of work of local government and public units made them start using tools that were used occasionally in the public sector but commonly used by the private sector – e.g., remote work or broader use of modern IT technologies (Modrzynski, 2020). The result was the development of the organizational and technological culture of the public sector, which had a positive impact on the effectiveness of its management.

2. Objective

The aim of the article is to answer the research questions posed:

(1) Will the pandemic experiences caused by the Covid-19 virus permanently affect the functioning of local government units in Poland?

¹ The history of blockchain technology dates back to 1991, when two cryptologists: Stuart Haber and Scott W. Stornetta published in the Journal of Cryptology an article entitled: "How to Time-Stamp a Digital Document", in which they presented the possibility of recording with a time stamp information sent over the Internet. The signs of time were defined with the help of data that allowed to determine the moment when a given event was made, e.g. a commercial transaction was concluded. In 1992, the so-called Merkle Trees – a type of data structure in the form of a tree containing hashed hashes of information about the data or a larger piece of data, thus increasing its efficiency and enabling the collection of multiple documents in one block. The technology was ultimately not used by anyone, and the patent itself expired in 2004, four years before the Bitcoin cryptocurrency, which used blockchain technology for the very first time on a massive scale. Blockchain technology is a kind of distributed ledger that consists of digitally recorded data organized into packets called blocks that are linked together in chronological order in such a way that once recorded data is later very difficult or impossible to change. Theoretically, a change of data could only be possible if it was made at the same time in all networks where data blocks are stored. Therefore, the decentralization and dispersion of networks is the basic advantage of blockchain technology and a guarantee of the security of the data stored in this way. This is because data blocks are stored on dispersed networks in different locations. Each node in the network contains a complete copy of the entire ledger, from the first created block (start block) to the last one. Additionally, each block includes a hash pointer as a link to the previous block, a timestamp, and transaction data.

(2) Will the use of blockchain technology become a standard secured digitally implemented process, especially those carried out by local government shared service centres?

3. Topic

Shared Service Centres (SSCs) are an excellent example of how to implement effectively modern technologies in Polish local governments and the broadly understood administrative space.

To understand the phenomenon, it is crucial to trace the SSC creation process and identify the elements necessary for its functioning, which allow for the uninterrupted and remote implementation of the joint service process.

In Poland, five years after implementing the relevant legal regulations, the process of establishing SSC is widely known to local governments. The experience shows that shared services usually focus on accounting and payroll services and are addressed to units that perform uniform statutory tasks – in most cases, these are educational units. Most often, SSCs in Poland were created as units that would ensure the security of shared services (mainly accounting, payroll and tax services) and enable savings (Fig. 1).

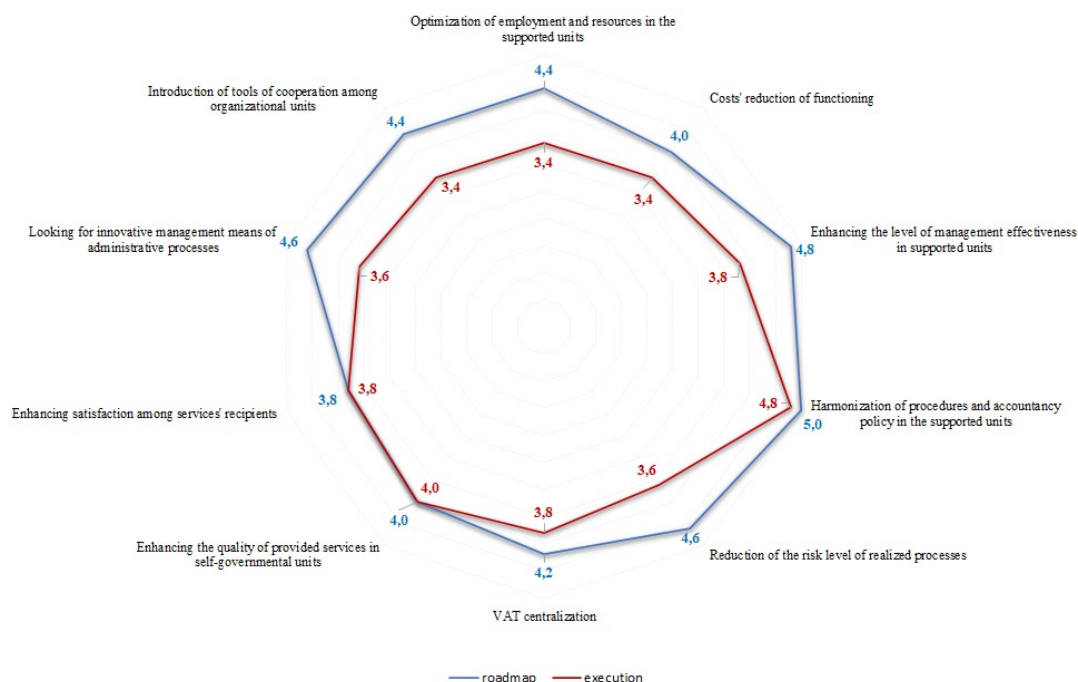


Figure 1. Main objectives in the process of establishing SSCs (supported unit treasurer evaluation – a roadmap and its execution)

Source: Modrzynski, P., Gawlowski, R., Modrzynska, J. (2019). Self-government Shared Service Centres.

Analysis of functioning and evaluation of provided service effectiveness,

<https://www.portalsamorzadowy.pl/pliki-download/134596.html>, access dated on 27.09.2021, p. 14.

Creating SSCs in most cases is also associated with the implementation of uniform software supporting the subject scope of the service provided. The results of research regarding the functioning of the local government shared services market conducted in cooperation with the Union of Polish Metropolises (Modrzynski P., Modrzynska J., Gawlowski R., Local Government Shared Services Centers. Analysis of the functioning and effectiveness of services provided, 2019) or the Association of Polish Poviats (Modrzynski P., Gawlowski R., Powiatowy Centra Usług Wspólnych in Poland, 2018) and audits of local government SSCs in Poland carried out by the author of this article indicate that the key element of an effectively provided joint service is the implementation of IT technologies based on "cloud" solutions, enabling the creation of databases and the implementation of joint service for numerous units. In many Polish local governments, their organizational units had used separate software and their local database. The transition to shared service forced the merging of these single databases containing key financial and accounting information as well as HR and payroll information for the provision of shared service. Many SSCs currently operating in Polish local government structures stopped at this stage. It included, among others, implementing modern cloud technologies in the field of software delivery and securing data copies in the virtual disk space. An organizational problem related to ensuring security, and above all – affecting the efficiency of SSC operation and the joint service it provides, is the physical delivery and proceeding on paper documents. Transport of documents from serviced units to SSC and from SSC to serviced units (e.g., signing documents generated from the payroll system by the head of a particular unit) is a labour-intensive, and cost-consuming activity and is potentially at risk of sensitive data leakage (e.g., gaining access to documents by unauthorized persons, loss of documents).

The number of documents and the high frequency of their delivery constitute a significant organizational challenge for both SSC, and the units served. Conducting joint service on a large scale and for many units is in opposition to the fundamental goals underlying the implementation of this type of solution: increasing the efficiency and safety of processes. The chart below presents the number of invoices generated in shared service by units operated by two exemplary Shared Service Centres, which handle several dozen units. These invoices, combined with other documents related to payroll services, make the annual number of documents exceeding 100,000 (Karaszewski, et al. 2021). Even such a negative situation as the global pandemic has its positive effects – it forced the public and local government sectors to look for solutions enabling the implementation of statutory tasks under the conditions of the sanitary regime – e.g. provision of remote work by public administration employees. So what is the role of SSC in creating opportunities and using remote work? What conditions must be met to enable more efficient solutions that ensure the security of the joint service provided? The answers to these questions should be sought in the third stage of SSC creation. A stage that is, at best, still planned in most Polish local governments. Extending the implementation of cloud solutions with the digitization of documents generated by supported units and the simultaneous use of a qualified digital signature allows eliminating the limitations and risks associated with the traditional paper flow of documents.

Additionally, such a solution offers many other possibilities. Scanning documents and working on their digital equivalent allows to (1) control the document flow (defining authorized persons, setting a precise

document flow path, full control over employees that are currently working on the documents), (2) finding documents that meet specific criteria (e.g., a specific supplier, type of service, date or amount), (3) introduce digital archiving of documents (securing stored documents is a significant organizational and financial challenge), and ultimately (4) perform work remotely. The basis of cloud solutions is that the software does not have to be installed on individual computers – it is enough to log into the particular system. Providing secure logging and digital signature and the use of advanced authentication systems, and preventing access to digital documents by unauthorized persons allows for secure execution of tasks in remote mode. Such solutions are commonly used on a much broader scale by the business sector, where SSCs are served by enterprises and corporations operating globally. The stages of establishing SSC in Poland that take their inspiration from these business solutions are presented in Figure 2.

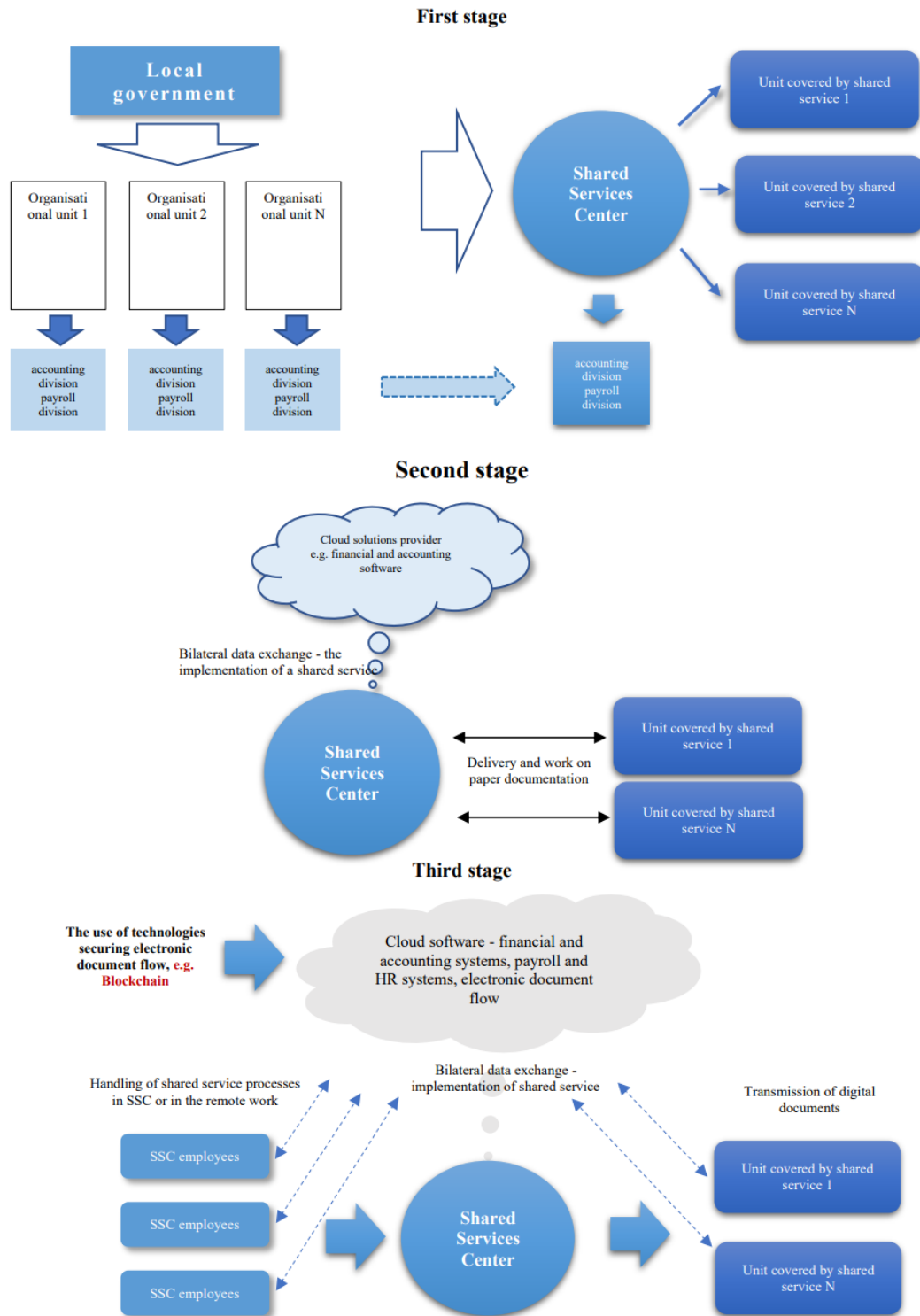


Figure 2. The process of creating local government shared services centres in Poland

Source: Karaszewski, R., Modrzynski, P., Modrzynska J., (2021), The Use of Blockchain Technology in Public Sector Entities Management: An Example of Security and Energy Efficiency in Cloud Computing Data Processing, *Energies* 2021, 14, 1873. <https://doi.org/10.3390/en14071873>.

Implementing the third stage technically enables the implementation of SSC tasks and ensures the continuity of the joint service provided in the form of remote work. In exceptional situations, such as the current pandemic, or other random events, this solution can ensure – through the use of online remote work – maintaining the continuity of this particular part of the tasks carried out by local governments. The precursor of such solutions in Poland was the city of Torun, which received an award for the pioneering implementation of Blockchain technology in the electronic circulation of documents in 2018 at the Smart City Forum (Atende Website, 28/09/2021). Thanks to this implementation, regardless of the pandemic era and the introduction of restrictions on the movement of residents, SSCs can implement their statutory objectives on an ongoing basis without the need to transport documents.

Although blockchain technology was initially used primarily in cryptocurrencies settlements, a scripting language made it possible to spread it also to other areas. The use of blockchain technology in the financial and banking sectors is well known. However, in recent years it has found application in different sectors of the economy, such as medical, pharmaceutical, energy, real estate, transport, logistics, accounting, and finally – public administration. Blockchain technology can be successfully used wherever we deal with complicated transactions, the participation of numerous entities, the flow of sensitive data, and the need to secure them. The spectrum of using data chains is significant: from storing and securing data on patient files, information about the real estate market, concluded transactions, notarial deeds through energy market transactions, vehicle and driver registers, to securing accounting and tax documents. A milestone in the process of implementing blockchain technology by the public administration was the parliamentary elections in Estonia in 2005, during which voters were given the option of remote voting for the very first time (I-Voting technology enables a citizen to vote in elections using digital tools, which has a significant impact on increasing citizen engagement and public participation in the country's governance process). It is worth emphasizing that Estonia is currently the only country where 99% of public services are offered to residents on a continuous basis, i.e., 24 hours a day, 7 days a week. Marriage and divorce are the only public services that are currently provided only in the traditional way. All other public services are implemented in digital form, and their security is supervised by blockchain technology (Zbieranek, 2018). Blockchain technology offers vast possibilities of its use, not only in the business sector, which it originates from but especially lately also in the public sector. Nowadays, the only noticeable barrier is the fear of implementing modern technologies resulting from their misunderstanding rather than the actual substantive or technical premises.

4. Conclusion

The dissemination of good practices in the public sector encourages subsequent local governments to implement modern solutions that enable them to conduct business even in extreme situations – e.g., pandemic. Even though the use of blockchain technology in Poland started in Torun, it has already spread to other SSCs (e.g., Elbląg, Kraków). It is difficult to tell whether it can be already called a nationwide trend of implementing

modern IT and technological solutions in the area of local government administration in Poland. Nevertheless, it is already a noticeable turn that shows how a modern public administration can function in the near future.

5. References

- Atende Website, (2021), *Pionierskie wdrozenie blockchain w sektorze publicznym*,
<https://atende.pl/pl/aktualnosci/pionierskie-wdrozenie-blockchain-w-sektorze-publicznym>, access
 dated on: 28.09.2021. (in Polish)
- Joha, A., Janssen, M., (2010), Public-private partnerships, outsourcing or shared service centres?: *Motives and intents for selecting sourcing configurations*, *Transforming Government: People, Process and Policy*, 4 (3), pp. 232-248, <https://doi.org/10.1108/17506161011065217>.
- Kisner, M., Vigoda-Gadot, E., (2017), The provenance of public management and its future: is public management here to stay?, *International Journal of Public Sector Management*, 30(6-7), pp. 532-546, <https://doi.org/10.1108/IJPSM-05-2017-0143>.
- Minnaar R., A., Vosselman E., G., J., (2013), Shared service centres and management control structure change: Exploring the scope and limitations of a transaction cost economics approach, *Journal of Accounting & Organizational Change*, 9(1), pp. 74-98, <https://doi.org/10.1108/18325911311307212>.
- Młodzik, E. (2015), *Zalozenia koncepcji New Public Management*, *Współczesne Problemy Ekonomiczne*, no. 11(2015), Szczecin, pp. 185-193, doi: 10.18276/wpe.2015.11-17. (in Polish)
- Modrzynski, P., (2018), Zarządzanie ryzykiem w samorządowych centrach usług wspólnych, *Samorząd Terytorialny*, 7-8/2018, pp.98-108. (in Polish)
- Modrzynski, P. (2020). *Local Government Shared Services Centers*. Management and Organization, Emerald Publishing. London.
- Modrzynski, P., Gawłowski, R., (2018), Finance Management in Local Government Shared Services Centres in Poland – Primary Experiences, *Problemy Zarządzania – Management Issues*, 16, 2(74), pp. 143-159.
- Modrzynski, P., Gawłowski, R. and Modrzynska, J., (2018), Samorządowe centra usług wspólnych. Zalozenia i praktyka, C.H. Beck, Warsaw. (in Polish).
- Modrzynski, P., Gawłowski, R., Modrzynska, J. (2019). *Self-government Shared Service Centres*. Analysis of functioning and evaluation of provided service effectiveness, <https://www.portalsamorzadowy.pl/pliki-download/134596.html>, access dated on 28.09.2021. (in Polish).
- Modrzynski, P., Karaszewski, R., Reuben, A., (2018), Process management in local government shared services centres – from an inventory of shared service processes to SLA designing, *Acta Scientiarum Polonorum. Oeconomia*, 3(2018).
- Osborne, S., (2010), *The New Public Governance?: Emerging Perspectives on the Theory and Practice of Public Governance*, Routledge, New York.

Ulbrich, F. (2006), Improving shared service implementation: adopting lessons from the BPR movement, *Business Process Management Journal*, 12(2), pp. 191-205.

Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym (Act of March 8, 1990 on the commune self-government), (Dz. U. z 2019 r., poz. 506, 1309, 1571, 1696, 1815). (in Polish)

World Economic Forum, How will blockchain technology transform financial services?, <https://www.weforum.org/agenda/2015/11/how-will-blockchain-technology-transform-financial-services/>, access dated 19.09.2021.

World Energy Council, The Developing Role of Blockchain White Paper; World Energy Council: London, UK, 2017.

Zbieranek, J. (2018), Głosowanie przez internet (i-voting) w wybranych państwach, *Zeszyty Prawnicze BAS* no. 2018 | 1(57) | pp. 9–45. (in Polish)

Zikratov, I., Kuzmin, A. and Akimenko, V., Ensuring data integrity using blockchain technology, Conference: 2017 20th Conference of Open Innovations Association (FRUCT), DOI: 10.23919/FRUCT.2017.8071359.

CONTEMPORARY CITIES AND CITY NETWORKS – THE KEY TO SUSTAINABLE DEVELOPMENT

Associate Professor Joanna Modrzynska

Faculty of Political Science and Security Studies

e-mail: jmod@umk.pl

ABSTRACT

The environmental challenges and sustainable development are among the most significant problems faced by not only States but cities worldwide. Apart from numerous advantages, the contemporary urbanization processes have multiple side effects that cause enormous environmental degradation. Undoubtedly states and international organizations are considered to be the main actors responsible for undertaking preventive measures. However, cities and city networks are increasingly gaining importance in legislation procedures and activities taken at various levels. More and more often, cities and their networks participate actively in undertaking actions aimed at combating environmental challenges. Nowadays, they are the performers of tasks imposed by States or international organizations and become main actors at the international scene and undertake different initiatives focused on dealing with environmental problems and transforming themselves into sustainable and resilient entities.

Keywords: European Cities, City Networks, Sustainable Development, Environmental Challenges

1. Introduction

According to many researchers, cities have probably been one of humanity's most significant and innovative inventions, one that in turn generates further innovations – political, organizational, social, cultural, and scientific (Szpak, 2016). However, today's environmental challenges often prove that States in many cases lack the power to instigate necessary changes at the international level. On the other hand, they are too large to solve local or subnational problems efficiently. Many cities, among them European ones, are now intensively cooperating at different levels. They create local, regional and international city networks focused on good practices sharing and cooperation. And their efforts are more and more visible and appreciated. The Eurocities Strategic Framework 2020-2029 emphasizes that: "We strive for a Europe where cities are genuine partners with the EU to create a better future [...] where city governments address global challenges [and] city governments are fit for the future".

Although city networks have different targets and cooperate in various fields, the threats resulting from climate change are undoubtedly one of the most significant problems recognized currently by the international community. Among the most pressing problems are air, water, and soil pollution, rapidly growing heaps of

rubbish, and exploitation of natural resources. These are just some examples of human activity, the effects of which are irreversible or extremely difficult to reverse. Unfortunately, changes accompanying the process of urbanization and city development have numerous side effects. On the one hand, cities are the cradle and birthplace of civilization, but on the other – the primary source of unfavorable environmental changes that affect humanity.

2. Objective

This article aims to present cities and their networks as quite new but already effective actors at the international arena that is involved in environmental protection. Even though networks have different ranges and are established in different ways (top-down and bottom-up initiatives), many share a common goal, i.e. combating environmental pollution. Cities and their networks often cooperate to minimize common problems because environmental issues are often problems for which national borders do not exist.

3. Cities and States in fighting environmental challenges

Mark Amen and others (2011) emphasized that the “emerging evidence about the global role of cities confirms that there are limits on the formal institutions of the state and inter-state systems and that now more than ever there is an urgent need for innovative accounts of international relations”. It must be admitted that States and international organizations are often better prepared and have more considerable resources than the individual city can afford. On the other hand – they have other issues that require their attention at the national and international level. This is where cities have a huge role to play, especially in the area of problem-solving, even global problem-solving, especially when they form robust city networks, multiplying their potentials and strengths in this way. The activities undertaken by cities within the networks have been widely recognized. Cities are currently part of the global multi-level governance and they take part in managing global problems, especially climate change and sustainable development.

As it was already mentioned, environmental challenges are among the most significant problems humanity and it cannot be addressed by States and international organization alone. Harriet Bulkeley and Michele M. Betsill (2003) point to the fact that „climate change is not only a global issue, it is also a profoundly local issue” and „cities are central to the politics of climate change”. Bulkeley and Betsill note four main reasons for such a situation:

1. cities are sites of high consumption and waste production,
2. local authorities are responsible for translating global rhetoric into local practice in regards to sustainable development,
3. local leaders can lobby national governments and develop practical projects at the same time,
4. local authorities have considerable experience addressing environmental issues and undertaking innovative measures to reduce their impact on climate change.

Cities and cities networks vary all over the world. Although scientists and experts agree that cities need to change and redefine their approach to environmental issues, there is no one-size-fits-all solution. Transformation processes and reaching the status of “green or smart city” requires the solution of numerous problems, among which are issues related to (1) transport and movement, (2) water and food supply, (3) consumer products supply, (4) growing green business and industry, (5) provision of sustainable city infrastructure, (6) and natural disaster prevention. Many cities struggle with not only one or two above mentioned issues, therefore in most cases holistic approach to environmental challenges is essential.

According to Hilda Blanco and Daniel A. Mazmanian sustainable cities approach „must ultimately be spread globally, although not through the dictates of a central authority or even binding global policy agreement, but the cumulative action of path-breaking lead cities and their leaders around the world. (2014). They completely understand and support the global approach. Still, at the same time they are convinced that cities' efforts and initiatives are critical in the global transformation to sustainability perceived in social, economic, and environmental terms (2014).

It is difficult to imagine that the fight against environmental pollution will be the domain of only states or only cities. Cities have more funds and more significant opportunities on the forum of international organizations. In turn, cities are closer to problems and are able to solve them on the spot, using the experience and good practices gained through cooperation in – among others – city networks.

4. City cooperation

The beginning of the 90s of the twentieth century brought a rapid development of all kinds of cities' initiatives dedicated to environment protection and sustainable development. In 1992, during the Earth Summit held in Rio de Janeiro, the international community noticed that States' cooperation on the international level is not effective enough in many areas. Therefore, Agenda 21 agreement, among others, focused on promoting local environment initiatives independent of ongoing national negotiations, already binding international treaties, and often weak actions undertaken by individual States at the central and international level.

Cities all over the world are eager to undertake all kinds of cooperation initiatives or join existing ones. International initiatives regarding environmental protection can be divided, among others, due to the place where an initiative appears. City networks are created due to intergovernmental initiatives or ideas emerging in international organizations, that is, as a result of top-down initiatives. On the other hand, city networks are often born as bottom-up initiatives and individual cities' activities. There is also a third way that can be called a hybrid solution. This solution creates new or uses existing initiatives for collaboration that are limited to cities and combines additional parties: towns, city networks, international organizations (local, regional and international), urban architects and city planners, representatives of urban cultural life etc.

Looking at the top-down initiatives that are being developed for cities or addressed directly to cities, a few international organizations lead the way in terms of the number of initiatives. Initiatives initiated by the United Nations have undoubtedly marked the last decades. In 2000 UN marked the beginning of the new

millennium with Millennium Development Goals (MDG). Among them goal No 7: ensure environmental sustainability emphasized the importance of environmental issues (Millennium Development Goals and Beyond 2015). Although implementing MDGs was successful in many ways, the UN decided to follow the blow and initiated work on the post-2015 agenda for the next 15 years. Currently, the United Nations implements 17 Sustainable Development Goals (SDGs) most of which (as was the case with MDGs) are at least partially affected by the problems that cities face daily (e.g., No. 1 – No poverty, No. 2 – Zero hunger, No. 6 – Clean water and sanitation, No. 7 – Affordable and clean energy, No. 13 – Climate action). It should be emphasized, however, that it is completely new to dedicate one of the goals entirely to cities. Goal No. 11 – „Sustainable cities and communities” – is exclusively focused on making cities and human settlements inclusive, safe, resilient, and sustainable (Millennium Development Goals and Beyond 2015). Including cities in the goals is tangible proof of their growing strength and importance in international relations. Therefore, the so-far leading players – States and international organizations – can no longer ignore this increasing role in the international arena. Moreover, they should take immediate steps to include cities in the decision-making processes at the international level.

Another vital initiative was UN Climate Change Conference (Conference of Parties – COP 21) held in Paris in 2015. It allowed parties to the UN Framework Convention on Climate Change (UNFCCC) to reach a critical agreement that marked an entirely new direction for the efforts aimed at fighting climate change. Even though – contrary to MDGs – Paris Agreement does not refer directly to cities, many of them (e.g. municipalities, urban areas or local governments, urban initiatives) refer directly to the provisions of the Agreement. Currently, cities worldwide play a much more active and central role in implementing provisions of the Paris Agreement than in many other international processes. They do not just encourage countries or put pressure on States to adopt a global climate deal, but they also make commitments of their own and make their voices audible (Tubiana and Guérin, 2020). At this point, the “We Are Still In” Declaration deserves special attention. After US exited the Paris Agreement US mayors, governors, heads of education and cultural institutions, businesses, faith groups, and cultural institutions declared „to help the United States fulfill its international obligations under the agreement”. Their Declaration was immediately supported by C40, ICLEI, Climate Mayors, the National League of Cities, many NGOs, and charities (Grandi, 2020).

An initiative with a much longer history is the UN-Habitat New Urban Agenda that supports all kinds of human settlements. The first United Nations Conference on Human Settlements (Habitat I) took place in 1976 in Vancouver, Canada, and is considered to be the first international conference to recognize the growing impact of urbanization and the need to ensure sustainable urban development. Subsequent Habitat conferences took place in Istanbul, Turkey in 1991 (Habitat II), and the third conference in Quito, Ecuador in 2016 (Habitat III). In contrast to many other points of view UN-Habitat New Urban Agenda does not perceive cities as the leading cause of the world's environmental problems today, but on the contrary, it takes the position that „we have reached a critical point in understanding that cities can be the source of solutions to, rather than the cause of, the challenges that our world is facing today” (the UN-Habitat New Urban Agenda, p. iv). It also emphasizes the correlation

between good urbanization and development and encourages cities to create sustainable, resilient, and caring for the natural environment places (The New Urban Agenda, p. 7).

Environmental issues are also of key importance from the European Union point of view. In 2019, the EU adopted the European Green Deal (EGD) that is often perceived as a response to the Sustainable Development Goals set by the United Nations. The EGD aims to tackle climate and environmental-related challenges and to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use (European Green Deal, 2.1.1. – Increasing the EU's climate ambition for 2030 and 2050).

States' and international organizations' initiatives are not the only activities undertaken for the benefit of cities. Additionally, the grassroots actions taken by the cities themselves are worth paying attention to. One of the very first initiatives was the European Urban Charter I – a document that was inspired by the European Campaign for Urban Renaissance conducted by the Council of Europe from 1980 to 1982 and adopted by the Congress of Local and Regional Authorities of the Council of Europe in 1992. This initiative was the cornerstone for starting processes focused on improving the quality of living in European towns and cities by promoting urban development and management at the local level and protecting fundamental freedoms and human rights functioning alongside collaboration and solidarity (European Urban Charter 1992). Quite similar in some aspects, but on the other hand, utterly innovative in others was the 2008 European Urban Charter II – Manifesto for a new urbanity, which updated the original Charter I and proposed a new approach to building modern and sustainable towns and cities. It focuses on contemporary issues like globalization and offers new solutions to new challenges (European Urban Charter II – Manifesto for a new urbanity, 2008).

In 1994 the Charter of European Cities and Towns Towards Sustainability was approved. This is another document that perceives cities, towns, and local governments as key players in the process of achieving sustainable development and at the same time recognizes natural differences among cities. The Charter emphasizes that „sustainability is neither a vision nor an unchanging state, but a creative, local, balance-seeking process extending into all areas of local decision-making (Charter of European Cities and Towns Towards Sustainability, para. I.5).

There are also a whole lot of city networks that focus their efforts on environmental issues. Although the C40 network is a relatively new initiative, it has already taken many actions and grows rapidly. Currently, it comprises almost 100 cities that generate about 25% of world GDP and work together to achieve the Paris Agreement goals and fight against climate change.

The International Council for Local Environmental Initiatives, known as ICLEI – Local Governments for Sustainability is also very interesting. Currently, it is a home for a global network of more than 2500 local and regional governments in over 125 countries committed to sustainable urban development. With global experts in 24 offices, ICLEI is one of the largest city networks devoted to building a sustainable urban world by providing cities with training activities, the framework for peer exchange and joint projects, and ensuring cities representatives' participation in international law-making.

Among the numerous organizations and networks of cities that aim to undertake environmental countermeasures are Asian Network of Major Cities 21, Association International Villes et Ports, Association of Cities and Regions for Recycling and Sustainable Resource Management, CityNet, Climate Alliance, European Association of Cities in Energy Transition - Energie-Cités, Covenant of Mayors for Climate and Energy, Fab City Global Initiative, Worldwide Network of Port Cities, and many others. They serve as the hub and platform for metropolises to connect and share experiences on many local and global issues. They are the focal point of worldwide experience and expertise on metropolitan governance. Additionally, they facilitate programs, networks, and partnerships to build the capacities of local governments.

5. Conclusion

The initiatives aimed at fighting problems and challenges faced by cities' have grown in numbers and have grown tremendously in recent decades. Although degradation of the natural environment is progressing rapidly and measures taken to prevent environmental destruction are far from sufficient, cities' activities allow us to hope to overcome the adverse effects. As humanity, we have already seen that actions undertaken at the intergovernmental level in many cases turn out to be insufficient. Hence, probably, the turn of the great international players towards cities and their networks. A few decades ago, cities' active and noticeable participation in international relations or international law-making processes was difficult to imagine. Now the trends have reversed and cities are more and more commonly perceived as rightful actors at the global scene. In 2014 the UN Secretary-General appointed the first Special Envoy for Cities and Climate Change in 2014 it was clear proof that cities and mayors play the crucial role in tackling the global problem of climate change. The words of the first Special Envoy – Mike Bloomberg – are extremely often quoted to this day as the best evidence of the growing role of cities: „We're the level of government closest to the majority of the world's people. We're directly responsible for their well-being and their futures. So while nations talk, but too often drag their heels – cities act" (Nijman, 2016).

7. References

- Amen, M. et al. (eds). (2011). *Cities and Global Governance*. Farnham: Ashgate. New Sites for International Relations.
- Blanco, H., Mazmanian D. A. (2014). 'The sustainable city: introduction and overview' in eds. D. A. Mazmanian, H. Bianco (eds), *Elgar Companion to Sustainable Cities. Strategies, Methods and Outlook*. Cheltenham UK and Northampton USA: Edward Elgar Publishing.
- Bulkeley H. and Betsill M. M. (2003). *Cities and Climate Change. Urban sustainability and global environmental governance*. New York: Routledge.
- Grandi L. K. (2020). *City Diplomacy*, Palgrave Macmillan (https://doi.org/10.1007/978-3-030-60717-3_7)
- Nijman J. E. (2016). *Renaissance of the City as Global Actor. The role of foreign policy and international law practices in the construction of cities as global actors*. ASSER research paper.

- Szpak A. (2016). The Growing Role of Cities and Their Networks in the International Relations and International Security. *Athenaeum. Polskie Studia Politologiczne*, 52, 54-77.
- Tubiana L. and Guérin E. (2020). The Paris Agreement on climate change: what legacy?' in C. Henry, J. Rockström and N. Stern. *Standing up for Sustainable World*. Cheltenham UK and Northampton USA: Edward Elgar Publishing.



Room 3

Science, Technology,
Engineering

GROWTH RATES AND YIELD OF SPRING ONION (*ALLIUM FISTULOSUM* L.) GROWN IN SOIL SUPPLEMENTED WITH BAMBOO BIOCHAR

Saifon Sinsamudthai¹, Yupa Pootang-on²,

Nualpen Puangpunsi³, Pantipa Na Chiangmai⁴

**Faculty of Animal Sciences and Agricultural Technology, Silpakorn University, IT Campus,
Phetchaburi, Thailand**

¹ E-mail address: saifonsinsamutthai@gmail.com

² E-mail address: pootangon_y@silpakorn.edu

³ E-mail address: puangpunsi_n@silpakorn.edu

⁴ E-mail address: nachiangmai_p@silpakorn.edu

ABSTRACT

The current study investigated influence of with- and without bamboo biochar supplementation into the soil (9:1 w/w) received three different watering frequencies (watering at every day, every two days, and every three days) in two cropping of spring onion (*Allium fistulosum* L.)- Variety: *Uttaradit*. In the first cropping, treatments of soil amended with biochar caused a significant reduction in all characteristics, that is to say, it found on rate of plant height increase and fresh weight yield per plant, but no results in the rate of bulbs formation. However, there were significant differences noted on rate of plant height increase and rate of bulbs formation positively affected by the supplementation of biochar into the soil in the second cropping. There was a significant difference in plant height growth rate and fresh weight yield affected by the different watering frequencies that lower value was observed in watering every three days. Whereas, it found no significant difference between different watering frequencies on rate of bulbs formations and less effect on plant height growth rate among treatments of soil amended by biochar. Therefore, biochar could have the ability to retain water and release the nutrients into soil which enable the support to plant growth in the second cropping.

Keywords: Water Deficiency, Soil Amendment, Moisture Retention, Biochar, Biomass

1. Introduction

Since suitable soil for plantation should contain sufficient growth factors, both physical and chemical properties, such as water, air and nutrient to support the plant growth. Sandy loam, and underground with solid soils have been recorded as non-fertility soil due to the leaching of soil. This type of soil is mostly found in the slop areas of the country. Meanwhile, it is well-known that Phetchaburi province is one of the important vegetable plantations in the country because of its abundance in water and moist in the soil. However, those non-fertility

soil types also found in Cha-Am district where the cultivation and marketing of spring onion (*Allium fistulosum* L.) are widely practices among local farmers. Despite, spring onion can be grown in the sandy loam soil, moisture is still important for the plant growth.

Organic fertilizers and natural materials are used as the alternative solution of water deficiency in sandy loam soil by improving both physical and chemical properties of soil. Introduction of biochar into this problem of soil is one of interesting options among farmers and researchers today. Biochar is easy to find in the agricultural activities and low cost. It also has beneficial characteristics like high porosity, high surface area, high carbon component, and nutrient rich; however, those properties depended on its original material and the production process of the biochar (Hossain et al., 2020). Therefore, biochar could improve soil properties, increase plant yield, and sequesters carbon from the atmosphere into the soil (Kalus et al., 2019). Moreover, the use of biochar encourages the reduction of improper management of agricultural waste in agriculture production that can cause the environmental problem. Consequently, using organic biochar will contribute to sustainable agricultural development and increase farmer's self-reliance. However, soil amendment with biochar is one method of using organic materials, this may take long period of time in the achievement of both benefit to the soil regeneration and effect to crop yields.

2. Research Objectives

This research study aimed to evaluate the rate of plant height increase, rate of bulbs formation, and fresh yield per plant of spring onion (var. *Uttaradit*), which is planted twice in the soil supplemented with bamboo biochar and received different watering frequencies.

3. Literature Review

3.1 Theory, Concept and Related Research

The characteristics of biochar like the high porosity, high surface area and surface changes make it has the property for water retention. These properties of biochar, both in case of nutrient and water retention, are available in soil with the ability to reduce the leaching process in soil (Hossain et al, 2020). Biochar also can be a direct nutrient source for plant and soil microorganism because its including macronutrients (nitrogen; N, phosphorus; P, and potassium; K) and micronutrients. However, the nutrient contents depend on type of biochar and the pyrolysis temperature in biochar production process (Li et al., 2017; Hossain et al, 2020). Upon the benefit of using biochar supplemented in soil, the immediate benefit may be the ability to increase water-holding capacity in the soil and nutrients are released to soil later. Low fertility soils could be sometimes caused by a lack of organic matter or the quality of soil types in easy releasing nutrients from soil matter. Actually, soils with low water holding capacity and low nutrient properties are sandy soils (Tahir and Marschner, 2017). Soil enrichment by introducing charcoal is one technique to increase the soil moisture retention ability and increase soil nutrients that is important for the improvement of sandy soil or soils with mostly sand.

The effect of charcoal can therefore be assessed on sandy loam soils for growing crops that require large amounts of water, especially vegetable cultivation. In Thailand, spring onion (*Allium fistulosum*) is known as a fundamental ingredient in Thai cuisine. It has the medicinal properties, including antioxidant, anticancer, and antimicrobial properties (Aslam et al., 2017). In the spring onion plantation, it requires optimum water throughout the growing season in order to increase plant growth and yield. As the reasons mentioned above, it can be inferred that biochar supplementing to the soil is an alternative option to maintain adequate moisture through the spring onion growing season.

3.2 Research Framework

The research framework is shown in Figure 1.

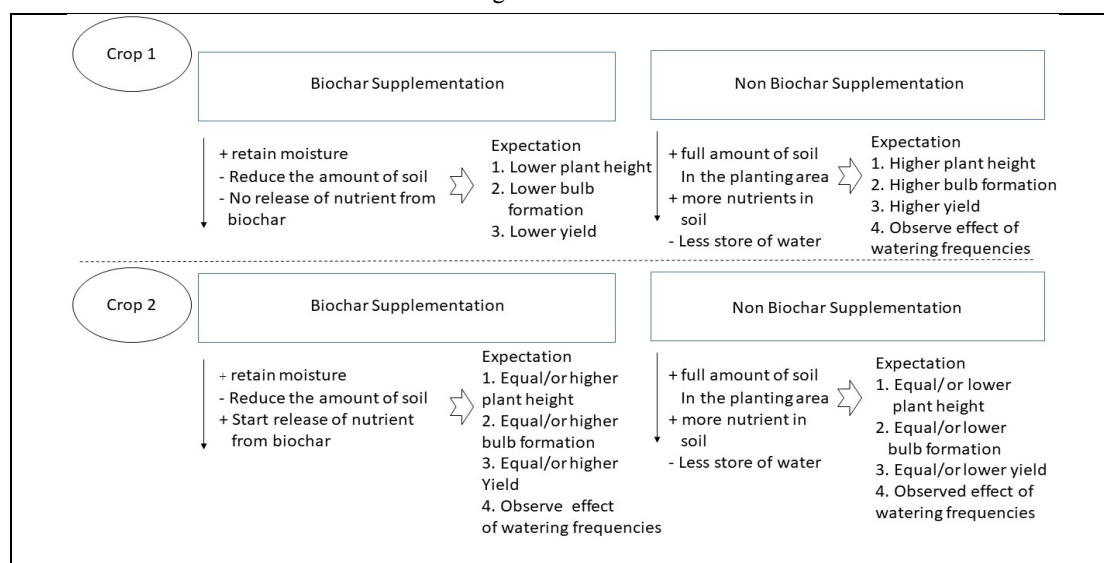


Figure 1 Research Framework

3.3 Research Hypothesis

The supplementation of biochar in the soil has the ability to reduce the frequency of irrigation in spring onion planting.

4. Research Methodology

4.1 Materials and Methods

Spring onion (var. *Uttaradit*) harvested from the last growing season was used in this study. Same size of onion bulbs with 0.2 cm for shoot length and 2 cm bulb diameter size was used for planting. Bamboo biochar was prepared by chopped the bamboo into small size of 2x2 cm or lower and dried under sunlight, burned or pyrolyzed at 450 °C for three hours. Sandy loam soil was used for planting in this study. Determination the water retention capacity in sandy loam soil by calculation as followed: $(A - B) / B \times 100\%$, when A = wet soil weight after water adsorption at fill capacity, B = dry soil weight at 105 °C for 24 hours. This result was used to determine the frequency of watering for spring onions.

4.2 Treatments, planting practices, experimental design and data analysis

Six treatments with two factors (2 bamboo biochar applications; with- and without biochar, and 3 watering frequencies; every day, every two days and every three days) in combinations were conducted in this study. Approximately 10 kilograms of the sandy loam soil was prepared in each pot (pot size as 30 cm diameter). For the treatment with bamboo biochar, biochar was mixed into soil in ratio as 1:9 (w/w). Spring onion bulbs were soaked with nil water for 48 hours. Three spring onion bulbs were planted in each pot (one per hill) about 2 cm depths into the ground. Two experiments (two cropping) of a plant were conducted in this study. The same pots and soil according to each treatment from the first cropping was used to plant the spring onions in the second cropping. The plots were placed outside and inside the greenhouse for the first and second cropping, respectively. Watering was conducted according to each treatment by using 2.5 liters for pouring in the morning and evening in first cropping, and only in the morning in second cropping. Applied fertilizer as 15-15-15 as 5 g/pot and 46-0-0 as 5 g/pot (N-P-K) at 15 and 30 days after planting, respectively. The experiment period was between March – July 2021.

Experimental design was 2x3 factorial in completely randomized design (CRD) with ten replications. The factors including two biochar applications and three watering frequencies. Analysis of variance (ANOVA) was analyzed in all characteristics using R program: the statistic software version 4.0.2 (R Core Team, 2020).

4.3 Data determination, experimental design and data analysis

Data were collected from three spring onion plants (three hills) in each pot. The rate of plant height increase and rate of bulbs formation were investigated from the calculation of growth rate at one, three, five, seven weeks after planting, according to the following formula: growth rate (at n weeks) = $(C - D)/D$ when C = data at n weeks, D = data at planting. Fresh weight per plant was recorded at a harvest period in week 7.

5. Results

The increasing of plant height growth rate in week 1, 3, 5, and 7 was presented in first cropping in Table 1. Rate of plant height increase at week 3, week 5, and week 7 were higher values with the significant differences in plants grown in soil with biochar supplementation more than plants grown in soil without biochar adding in first cropping (Table 1). This characteristic was determined as a non-significant difference affected by the frequency of watering in all weeks (week 1, 3, 5, and 7) after planting. However, a significant interaction between biochar supplement with watering frequencies in week 3 and week 5 after planting found in first cropping. There was higher rate of plant height increase on a plant grown in soil with no supplementation of biochar, highest in water every three days, every two days, and every day, respectively. However, in soil contained biochar mixing, non-significant differences in rate of plant height increase found among plants in treatments that received the watering in different frequencies.

Table 1 Analysis of variance and mean \pm standard deviation in rate of plant height increase at week numbers after planting of spring onion (var. *Uttaradit*) in supplemented soil with bamboo biochar (ratio 9:1 w/w) under different watering frequencies in first cropping

Treatments	PHR_W1 ¹	PHR-W3	PHR-W5	PHR-W7
P-value (Biochar)	4.12x10 ⁻⁶ **	6.24x10 ⁻⁶ ** ³	2.43x10 ⁻⁴ **	9.71x10 ⁻⁴ **
biochar	6.04 \pm 5.42	75.42 \pm 11.62Y ⁴	100.37 \pm 11.53Y	104.16 \pm 10.43Y
Without biochar	15.08 \pm 8.20	93.22 \pm 17.17X	112.03 \pm 12.52X	114.06 \pm 11.07X
P-value (Watering)	0.429NS ²	0.206NS	0.971NS	0.507NS
Every day	9.12 \pm 6.51	80.22 \pm 12.11	106.15 \pm 9.16	107.00 \pm 12.80
Every 2 day	12.11 \pm 6.15	84.70 \pm 19.21	105.79 \pm 12.89	111.07 \pm 10.19
Every 3 days	10.15 \pm 11.16	88.05 \pm 18.93	106.66 \pm 17.29	109.24 \pm 12.43
P-value (Biocharxwatering)	0.091NS	0.019*	0.013*	0.867NS
biochar, Every day	6.07 \pm 6.37	77.93 \pm 10.31c	105.68 \pm 9.18bc	102.33 \pm 10.67
biochar, Every 2 days	9.14 \pm 4.92	75.23 \pm 12.69c	100.40 \pm 9.83bc	105.08 \pm 7.23
biochar, Every 3 days	2.90 \pm 2.87	73.10 \pm 12.43c	95.02 \pm 13.56c	105.05 \pm 13.39
Without biochar, Every day	12.50 \pm 5.03	82.50 \pm 13.85bc	106.62 \pm 9.60b	111.67 \pm 13.53
Without biochar, Every 2 days	15.08 \pm 6.00	94.17 \pm 20.46ab	111.18 \pm 13.76ab	117.05 \pm 9.36
Without biochar, Every 3 days	17.41 \pm 11.74	103.00 \pm 10.25a	118.30 \pm 12.09a	113.43 \pm 10.38
Overall mean (CV; %)	10.48 (64.50)	84.32 (16.35)	106.20 (10.82)	109.10 (10.67)

^{1/} PHR_Wn = rate of plant height increase at week 1,...,n ^{2/} NS means non-significant difference at 0.05 level of probability. ^{3/}

*,** means significant different at 0.05 and 0.01 levels of probability, respectively. ^{4/} Different upper case letters (X, Y or a, b, c,...) in the same column means significant difference at 0.05 level of probability.

There were no statistically significant differences in rate of bulbs formation for both individual factors and interaction between factors (biochar and watering frequency) in almost weeks after planting in first cropping (Table 2). However, a highly significant difference in fresh weight yield per plant was found with higher yield recorded in plants grown in soil supplemented without biochar (Table 2).

Table 2 Analysis of variance and mean \pm standard deviation in rate of bulbs formation at week numbers, and fresh weight yield per plant (g) after planting of spring onion (var. *Uttaradit*) in supplemented soil with bamboo biochar (ratio 9:1 w/w) under different watering frequencies in first cropping

Treatments	BFR-W1 ¹	BFR-W3	BFR-W5	BFR-W7	Yield-W7
P-value (Biochar)	0.204NS ²	0.972NS	0.738NS	0.610NS	4.16x10 ⁻⁵ **
biochar	0.93 \pm 0.51	3.92 \pm 1.04	4.42 \pm 1.09	4.28 \pm 1.05	3.40 \pm 0.94Y
Without biochar	1.18 \pm 0.77	3.93 \pm 1.13	4.31 \pm 1.40	4.13 \pm 1.10	4.67 \pm 1.22X
P-value (Watering)	0.793NS	0.641NS	0.771NS	0.596NS	0.374NS
Every day	0.98 \pm 0.87	3.87 \pm 1.26	4.20 \pm 1.43	4.17 \pm 1.25	4.15 \pm 1.43
Every 2 day	1.07 \pm 0.60	4.12 \pm 0.94	4.48 \pm 1.06	4.40 \pm 1.05	3.75 \pm 1.20
Every 3 days	1.19 \pm 0.49	3.80 \pm 1.03	4.42 \pm 1.27	4.05 \pm 0.91	4.20 \pm 1.12
P-value (Biocharxwatering)	0.150NS	0.895NS	0.960NS	0.775NS	0.752NS
biochar, Every day	0.85 \pm 0.25	3.90 \pm 1.09	4.20 \pm 1.12	4.24 \pm 1.09	3.37 \pm 1.01
biochar, Every 2 days	0.67 \pm 0.52	4.17 \pm 1.03	4.60 \pm 1.15	4.60 \pm 1.06	3.17 \pm 0.84
biochar, Every 3 days	1.42 \pm 0.62	3.70 \pm 1.06	4.47 \pm 1.07	4.00 \pm 1.02	3.67 \pm 0.98
Without biochar, Every day	1.14 \pm 1.31	3.83 \pm 1.47	4.20 \pm 1.75	4.10 \pm 1.46	4.93 \pm 1.40
Without biochar, Every 2 days	1.32 \pm 0.52	4.07 \pm 0.90	4.37 \pm 1.00	4.20 \pm 1.04	4.33 \pm 1.26
Without biochar, Every 3 days	1.08 \pm 0.39	3.90 \pm 1.05	4.37 \pm 1.51	4.10 \pm 0.83	4.73 \pm 1.02
Overall mean (CV; %)	1.08 (62.15)	3.93 (28.36)	4.37 (29.65)	4.21 (26.16)	4.03 (27.27)

^{1/} BFR_Wn = rate of bulbs formation at week 1,...,n ^{2/} NS means non-significant difference at 0.05 level of probability. ^{3/} *, ** means significant different at 0.05 and 0.01 levels of probability, respectively. ^{4/} Different upper case letters (X, Y) in the same column means significant difference at 0.05 level of probability.

For the second cropping, a statistical difference was found for the rate of plant height increase affected by either individual factors and the interaction between factors (biochar and watering frequency) in different weeks after planting (Table 3). Overall means of treatments that was supplemented with biochar had a higher rate of plant height increase than the treatment that had not supplement with biochar in week 1, 3, and 5. The frequency of watering affected the rate of plant height increase from the first week onwards. From the third week of planting onwards, it was found that watering at every three days showed a lower rate of plant height increase than other treatments. However, a significant interaction among factors (biochar and watering frequency) was observed only one week; the fifth week after planting. Although the watering every three days had the lowest rate of plant height increase in both with- and without biochar adding, the reduction in the rate of plant height increase was greater in the treatment without biochar supplementation.

Table 3 Analysis of variance and mean \pm standard deviation in rate of plant height increase at week numbers after planting of spring onion (var. *Uttaradit*) in supplemented soil with bamboo biochar (ratio 9:1 w/w) under different watering frequencies in second cropping

Treatments	PHR_W1 ¹	PHR-W3	PHR-W5	PHR-W7
P-value (Biochar)	2.07x10 ⁻⁶ ** ³	9.73x10 ⁻⁴ **	5.97x10 ⁻³ **	0.609NS
biochar	93.54 \pm 8.45X ⁴	146.15 \pm 12.45X	166.69 \pm 13.56X	172.09 \pm 15.04
Without biochar	79.71 \pm 12.49Y	136.11 \pm 13.29Y	158.51 \pm 15.58Y	170.29 \pm 16.36
P-value (Watering)	0.019*	1.78x10 ⁻⁴ **	3.48x10 ⁻⁷ **	3.72x10 ⁻⁴ **
Every day	83.36 \pm 9.69B	144.41 \pm 11.67A	169.57 \pm 11.73A	179.52 \pm 12.80A
Every 2 day	91.95 \pm 13.20A	146.92 \pm 11.02A	168.35 \pm 11.36A	172.74 \pm 15.11A
Every 3 days	84.56 \pm 13.58B	132.06 \pm 13.97B	149.89 \pm 13.47B	161.32 \pm 13.64B
P-value (Biocharxwatering)	0.291NS ²	0.238NS	0.033*	0.081NS
biochar, Every day	88.52 \pm 6.05	146.56 \pm 12.92	168.80 \pm 13.38ab	175.90 \pm 13.88
biochar, Every 2 days	97.72 \pm 10.09	151.65 \pm 9.44	172.72 \pm 12.18a	172.92 \pm 18.06
biochar, Every 3 days	94.38 \pm 6.60	140.25 \pm 13.09	158.57 \pm 12.11b	167.47 \pm 13.01
Without biochar, Every day	78.21 \pm 10.14	142.25 \pm 10.50	170.33 \pm 10.49a	183.13 \pm 11.13
Without biochar, Every 2 days	86.17 \pm 13.85	142.20 \pm 10.85	163.98 \pm 9.05ab	172.57 \pm 12.47
Without biochar, Every 3 days	74.75 \pm 11.49	123.87 \pm 9.57	141.22 \pm 8.33c	155.17 \pm 11.81
Overall mean (CV; %)	86.62 (11.62)	141.13 (7.90)	162.60 (6.81)	171.19 (7.93)

^{1/} PHR_Wn = rate of plant height increase at week 1,...,n ^{2/} NS means non-significant difference at 0.05 level of probability. ^{3/}

*,** means significant different at 0.05 and 0.01 levels of probability, respectively. ^{4/} Different upper case letters (X, Y or A, B, C or a, b, c,...) in the same column means significant difference at 0.05 level of probability.

There was a difference in the bulbs formation rate due to influence of biochar supplementation and the interaction between biochar adding and watering frequency (Table 4). Only first and third weeks after plants had significant difference on rate of bulbs formation affected by biochar adding. The higher values were observed in plants grown in soil supplemented with biochar. Interaction effect resulted on rate of bulbs formation was found only at first week after planting. Additionally, similar values of rate of bulbs formation were recorded between different frequencies of watering in plants grown in soil added with biochar. However, in without biochar treatments, watering at every three days had a lower rate of bulbs formation than every day watering and watering every two days. No difference in fresh weight yield per plant was influenced by biochar adding and interaction between biochar and watering frequency in the second planting. Nevertheless, effect of the frequency of watering was clearly which lower rate of bulbs formation on plants received watering in every three days.

Table 4 Analysis of variance and mean \pm standard deviation in rate of bulbs formation at week numbers, and fresh weight yield per plant (g) after planting of spring onion (var. *Uttaradit*) in supplemented soil with bamboo biochar (ratio 9:1 w/w) under different watering frequencies in second cropping

Treatments	BFR-W1 ¹	BFR-W3	BFR-W5	BFR-W7	Yield-W7
P-value (Biochar)	6.74x10 ⁻³ ** ³	6.34x10 ⁻³ **	0.209NS	0.270NS	0.089NS
biochar	4.82 \pm 1.04X ⁴	5.59 \pm 1.11X	5.96 \pm 1.40	6.25 \pm 1.57	3.09 \pm 0.81
Without biochar	4.04 \pm 1.20Y	4.73 \pm 1.22Y	5.50 \pm 1.42	5.80 \pm 1.59	2.78 \pm 0.76
P-value (Watering)	0.562NS ²	0.796NS	0.901NS	0.687NS	2.82x10 ⁻⁴ **
Every day	4.64 \pm 1.05	5.28 \pm 1.29	5.83 \pm 1.32	6.25 \pm 1.69	3.33 \pm 0.69a
Every 2 day	4.36 \pm 1.05	5.03 \pm 0.94	5.72 \pm 1.46	5.82 \pm 1.47	3.07 \pm 0.77a
Every 3 days	4.30 \pm 1.43	5.17 \pm 1.47	5.63 \pm 1.53	6.02 \pm 1.62	2.40 \pm 0.64b
P-value (Biocharxwatering)	0.018*	0.174NS	0.069NS	0.220NS	0.477NS
biochar, Every day	5.00 \pm 0.75a	5.73 \pm 0.91	5.93 \pm 1.13	6.56 \pm 1.71	3.63 \pm 0.58
biochar, Every 2 days	4.27 \pm 1.09ab	5.10 \pm 1.08	5.50 \pm 1.64	5.56 \pm 1.56	3.20 \pm 0.74
biochar, Every 3 days	5.20 \pm 1.09a	5.93 \pm 1.26	6.44 \pm 1.36	6.63 \pm 1.34	2.43 \pm 0.65
Without biochar, Every day	4.28 \pm 1.21ab	4.83 \pm 1.49	5.73 \pm 1.54	5.93 \pm 1.70	3.03 \pm 0.69
Without biochar, Every 2 days	4.45 \pm 1.07a	4.97 \pm 0.84	5.93 \pm 1.31	6.07 \pm 1.42	2.93 \pm 0.81
Without biochar, Every 3 days	3.40 \pm 1.15b	4.40 \pm 1.29	4.83 \pm 1.27	5.40 \pm 1.71	2.37 \pm 0.67
Overall mean (CV; %)	4.43 (24.13)	5.16 (22.61)	5.73 (24.26)	6.03 (26.20)	2.93 (23.69)

^{1/} BFR_Wn = rate of bulbs formation at week 1,...,n ^{2/} NS means non-significant difference at 0.05 level of probability. ^{3/} *, ** means significant different at 0.05 and 0.01 levels of probability, respectively. ^{4/} Different upper case letters (X, Y or A, B, C or a, b, c,...) in the same column means significant difference at 0.05 level of probability.

6. Discussion

Plant height is one of the important characteristics that indicate the plant growth because it is related to the leaf area and photosynthesis ability. Consideration on the interaction between no adding biochar in soil and difference frequencies of watering in first cropping (Table 1), it showed the increasing of high rate of plant height increase in every three days watering. This can be referred that different frequency of watering did not reflect the water deficiency in plant, despite the two days without watering in the study. Although the first cropping was conducted in the summer of Thailand (March – April 2021), the plants were watered two times a day, in morning and evening. Doing this could result in over-irrigation of the soil. Since water requirement in onion plant depended on agroclimate and stage of growth, water excess in the late stage of growth was reported affected to crop production (Ortolá and Knox, 2015). On the contrary, in the treatments added biochar into soil, there was no difference in the rate of plant height increase among different watering frequencies (Table 1). That may be caused by the porous properties of biochar making the aid in water retention. In addition, the soil is not too wet and affects the growth of the spring onion (Hossain et al., 2020). However, a lower rate of plant height increase was observed in the plants with no biochar supplementation in soil (Table 1). Lower fresh weight yields were found in the soil supplemented with biochar that could be explained in terms of biochar benefits to plant growing. Although the study of biochar reported many benefits to plant production such as increase soil nutrients, positive effects on soil microbes, water retention, and so on, slowly releasing nutrients into soil was reported as well (Liao et al., 2020). Based on the current study, the first cropping of spring onion planting hasn't had a clear positive

impact from bamboo biochar application. In treatments with biochar supplemented, the decreasing of soil content may result to lower soil nutrients compared to treatments without biochar in soil.

There was no significant negative impact on rate of bulbs formation, but resulted to fresh weight yield reduction in first cropping (Table 2). More than multi-bulbs formation, bulb sizes are also characterized to determine the yield quality of onions.

The result of high humidity of the soil in the first cropping was affected from the twice watering a day in each treatment, while, in the second cropping, there was only one irrigation, in the morning, of each treatment. In addition, the experimental pots were moved to the greenhouse in order to protect the uncontrolled rainfall because this cropping was conducted in June – July 2021 that is the rainy season in Thailand. Thus, watering at every three days showed a lower rate of plant height increase than others, both water at every day and every two days (Table 3). In the second cropping, the treatments that were supplemented with biochar showed a higher rate of plant height increase than the treatments non-supplemented with biochar that recorded in many weeks. It can be said that the benefits of biochar began to affect plant growth which is determined from the rate of plant height increase in the second planting. This might be the result of using the same pots and soils in both first and second plantings. The continuation of water intake for each treatment in two plantings may therefore affect the nutrients release and availability of biochar in the soil. This resulted in a higher growth rate on plant height in soil supplemented with biochar more than without biochar (Table 3). However, in biochar-amended pots, no significant difference was found in the growth rate of plant height between watering at every day and at every three days. Contrary, it showed the significant differences between those treatments in soil amended with biochar (10% by weight biochar) (Table 3). Biochar has been reported as the potential to increase the capacity of water-holding, resulted to slower nutrients leaching and reduce water requirement for planting (Jahromi et al., 2018). The properties of biochar began to notice a profound positive impact on both yield increasing and reduction of water use in the second plantings in this study. Likewise, the influence of biochar on the increase in rate of bulbs formation was observed in this second cropping (Table 4). Further, the formation of the bulb did not differ among the watering frequencies when the soil was supplemented with biochar (Table 4). For bamboo biochar that pyrolyzed at 450 °C, only 1% mixed in soil showed a beneficial effect on tomato fruit quality (Suthar et al., 2018). At this temperature of pyrolysis (450 °C), bamboo biochar had more surface functional groups, oxygen-containing groups than other temperatures. Moreover, for these properties, biochar can use in long-term in soil with containing stability (Suthar et al., 2018). Nevertheless, fresh weigh yield production showed a significant difference only affected by watering frequencies - higher values were observed at watering every day and every two days, and lower in watering every three days. For these results, it needs to confirm the influence of bamboo biochar supplementation from subsequent cycles of planting.

7. Suggestion

1. Since bamboo biochar has the water retention capacity, it can be used for planting in water deficit stress areas or water excess areas; such as in the rainy season. However, the benefits of soil amendment with biochar may not be effective adequately in the first cropping. The second and third cropping are suggested for the optimum benefits.

2. Further research is needed to study about the cycles of planting in order to create better and obvious assessment which is practical for the biochar implementation and knowledge transfer to farmers.

3. Assessment of the effects on chemical quality of spring onions influenced by planting in biochar amended soils would be beneficial to increase the value of yield.

8. Acknowledgement

We are most grateful to Huai Sai Development Study Center (Huai Sai RDSC) in Phetchaburi province for the financial support to the materials and planting areas in this research.

9. References

- Aslam, Z., Akhtar, S., Imran, M., Nadeem, M., Gilani, S., Elnashar, M. & Ahmed. (2017). Antioxidant activity, anti-inflammatory activities, anti-cancer and chemical composition of spring onion (*Allium Fistulosum*) extracts. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 8(2), 1880-1890.
- Hossain, Md Z., Bahar, Md M., Sarkar, B., Donne, S. W., Ok, Y. S., Palansooriya, K. N., Kirkham, M. B., Chowdhury, S., & Bolan, N. (2020). Biochar and its importance on nutrient dynamics in soil and plant. *Biochar*, 2, 379-420.
- Jahromi, N. B., Walker, F., Fulcher, A., Altland, J., & Wright, W. C. (2018). Growth response, mineral nutrition, and water utilization of container-grown woody ornamentals grown in biochar-amended pine bark. *HortScience*, 53(3), 347-353.
- Kalus, K., Koziel, J. A., & Opalinski, S. (2019). A review of biochar properties and their utilization in crop agriculture and livestock production. *Applied Sciences*, 3494. doi:10.3390/app9173494
- Li, H., Dong, X., da Silva, E. B., de Oliveira, L. M., Chen, Y., & Ma, L. Q. (2017). Mechanisms of metal sorption by biochars: biochar characteristics and modification. *Chemosphere*, 178, 466-478.
- Liao, J., Liu, X., Hu, A., Song, H., Chen, X., & Zhang, Z. (2020). Effect of biochar-based controlled release nitrogen fertilizer on nitrogen-use efficiency of oilseed rape (*Brassica napus* L.). *Scientific Reports*, 10, 11063. doi.org/10.1038/s41598-020-67528-y.
- Ortolá, M. P. & Knox, J. W. (2015). Water relations and irrigation requirements of onion (*Allium cepa* L.): a review of yield and quality impacts. *Experimental Agriculture*, 51(2), 210-231.
- R Core Team. (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- Tahir, S., & Marschner, P. (2017). Clay addition to sandy soil reduces nutrient leaching—effect to clay concentration and ped size. *Communications in Soil Science and Plant Analysis*, 48(15), 1815-182.
- Suthar, R. G., Wang, C., Nunes, M. C. N., Chen, J., Sargent, S. A., Bucklin, R. A., & Gao, B. (2018). Bamboo biochar pyrolyzed at low temperature improves tomato plant growth and fruit quality. *Agriculture*, 8, 153. doi:10.3390/agriculture8100153.

LANDSCAPE AND AVAILABILITY OF AI IN VARIOUS INDUSTRY PLATFORMS

Saw Than Htike Zin

Information and Communication Technology Program

International College, Rangsit University

E-mail: sawthanhtike.z62@rsu.ac.th

Tapu Ranjan Biswas

Information and Communication Technology Program

International College, Rangsit University

E-mail: tapuranjan.b62@rsu.ac.th

Tongleng Leang

Information and Communication Technology Program

International College, Rangsit University

E-mail: Leangtongleng6@gmail.com

Suttisak Jantavongso

Information and Communication Technology Program

International College, Rangsit University

E-mail: suttisak.j@rsu.ac.th

ABSTRACT

Artificial Intelligence (AI) has been improving different industries in diverse ways. Some improvements where AI can be found are managing rapid productivity, great reduction of errors at decision-making, and the growth of AI in different industries. This academic paper contains a brief discussion of Artificial Intelligence (AI) and how it helps improve Industry 4.0. The overall objective of this academic paper is to explore how helpful Industry 4.0 is, which is based on AI. As it advances to the next level, AI gradually assumes the lead as the single most important driving force for technological transformation. The findings indicated that AI is playing a key role in increasing productivity, and it also gives great benefits to human workers. It benefits the workers by working for humans, which reduces work hours that are risky for health. Instead, AI increases productivity working faster and longer than average human work hours. AI's decision-making is also a critical factor that is more accurate because of the lack of emotions and feelings. Because of its abilities, AI is bringing significant revenue growth to different industries in diverse ways. The paper suggested that more use cases of AI should be implemented to bring the world entire automated industries led by AI, which will allow humans to work smarter,

not harder. Finally, the authors suggest that future studies include more sources and practical research to prove that AI improves industries. This will bring a more valid result with less biased opinion so that the article is more reliable. Thus, the article indicates that AI is improving industries.

Keywords: Artificial Intelligence, Industry 4.0, Manufacturing, Productivity.

1. Introduction

The development of technology played a critical role in many parts of the world. Manufacturing has also evolved in many ways. Implementation of Artificial Intelligence (AI) in the manufacturing industry is a significant component of technology's contributions to the world. According to Ribeiro (2021), "*Artificial Intelligence is the combination of several technologies, which allow software and machines to sense, understand, act and learn on their own or augment human activities.*" This quote shows that AI is not the only technology being implemented to improve efficiency. However, it combines several technologies that unite software and machines to output efficient computing power. Ribeiro continued that, "*Also, AI can enable robots to perform tasks that a person would not be able to do, for example, handling dangerous raw materials or microscopic components.*" This assertion points out that humans have limitations in doing specific tasks, and AI can handle such tasks. AI can be implemented into robots to take extremely dangerous jobs or microscopic functions that are too small for humans to see or complete. By launching these types of AI into industries, manufacturing companies can improve their manufacturing to become industry 4.0. This is where technology will play a hand in facilitating the development of the industry in various areas. Innovative techniques, such as AI and robot systems, have been applied in manufacturing in the twenty-first century.

The motivation of this study is to raise awareness about the use of AI systems and examine the management perspective in the industrial environment. This paper encourages the implementation of AI in different industries. It is also not only about defining what is acceptable and what weaknesses in AI usage. Because digitalization encompasses a wide range of technologies and features, AI can be considered one of them, one that will impact not only corporations but also humanity.

2. Objective

The main objectives of the study are as follows:

- (1) to investigate how AI improve industries;
- (2) to identify the impacts of AI in productivity, error reduction, and revenue growth;
- (3) to denote the challenges and limitations of AI in industrial; and
- (4) to suggest the future development of AI in industry 4.0.

3. AI can improve the industries

AI can be implemented in industries in many ways. Some implementations of AI in industries are in manufacturing, analyzing, decision-making, and monitoring every process in industries. For example, BMW uses AI to analyze its components and check product quality (Wilson, 2020). Wilson (2020) continued that Nissan is also developing AI to implement it to modify its existing car while also considering the effects and impact of modifications. This proves that different companies are already implementing AI for various purposes to meet their requirements. Other types of AI are deployed in different areas of workspaces to improve productivity. AI is disrupted in industry areas such as health care, retail and e-commerce, food tech, banking and financial services, logistics and transportation, travel, real estate, entertainment and gaming, and manufacturing (Takyar, 2021). This clearly shows that AI is becoming a significant improvement in the manufacturing industry and other industries. As a result, AIs are assigned to complete jobs that need to be done repeatedly in sequences, works that use a large amount of data to analyze, or jobs that require accurate decision-making. Therefore, it is clear that AI is significantly improving different industries in different aspects.

3.1 AI in different Industrial platforms

Artificial consciousness platforms include the utilization of machines to play out the assignments that individuals perform. The stage recreates the intellectual capacity that human personalities perform, for example, critical thinking, getting the hang of, thinking, social knowledge just as broad insight. AI application likewise includes the utilization of master frameworks like discourse acknowledgment and machine vision. The simulated intelligence stage can be delegated either powerless AI/restricted AI, which is largely implied for a specific assignment, or solid AI, otherwise called counterfeit general insight, which can discover answers for new undertakings. At present, AI is implemented in a variety of different industrial platforms. According to Daley (2021), AI has been used in many other platforms such as manufacturing robots, self-driving cars, smart assistants, proactive healthcare management, disease mapping, automated financial investing, virtual travel booking agent, social media monitoring, inter-team chat tool, conversational marketing robot, and Natural Language Processing (NLP) tools. This indicates that there are already many industry platforms implementing AI in different ways.

3.2 AI and business's value

In the commercial world, AI is radically improving. As a result, business needs an Information Technology (IT) department. As AI evolves from science fiction to the center of firm advances, there is a strong need for structured AI development and application to see its true impact in the next generation of industrial systems. Davenport and Ronanki (2018) stated how useful is AI and why businesses should use AI in the following:

“It is useful for companies to look at AI through the lens of business capabilities rather than technologies. AI can support three important business needs: automating business processes, gaining insight through data analysis, and engaging with customers and employees.”

This shows that businesses use AI in three ways: automating business processes, analyzing a large number of data, and communicating with customers. This also proves that AI is a valuable tool to implement at different businesses in different methods.

3.3 Current AI technologies and tools

There are a few fundamental elements that AI technologies are used as tools in the industry. Lee et al. (2018) described AI technologies in different analytics technology, big data technology, cloud or cyber technology, and domain know-how. These technologies are evidence to support AI as an important component in the AI industry. Analytics is at the heart position of AI. AI is useful if all the other factors are combined. Likewise, big data technology and the cloud are critical components that provide a source of data and a platform for industrial AI.

4. Impacts of AI in productivity, error reduction, and revenue growth

AI can be implemented in many ways in industries. Some implementations of AI in manufacturing industries are analyzing, decision making, and automation which results in productivity, error reduction, and revenue growth.

4.1 AI increases productivity

In comparison to previous eras of industry, manufacturing was not as efficient as nowadays. This inefficiency is because of human labor in manufacturing operations, and humans are not as efficient as robots. Since factories rely on humans to complete the work at the early age of manufacturing, there is a limit upon the procedure and effort each worker can contribute to the industry. The healthiness of workers also has an important impact on productivity. World Health Organization (2021) stated the following:

“In a first global analysis of the loss of life and health associated with working long hours, WHO and ILO estimate that, in 2016, 398 000 people died from a stroke and 347 000 from heart disease as a result of having worked at least 55 hours a week. Between 2000 and 2016, the number of deaths from heart disease due to working long hours increased by 42%, and from stroke by 19%”.

Therefore, it is risky to have humans work longer than they should. The reason is that longer work hours can negatively impact health, such as developing diseases. On the other hand, the power of machines and AI combined can help solve this problem. This will help human labor to work smarter, not harder. King (2020) said the following:

“Robots don’t get tired or hungry and are capable of working on the production line 24/7. This allows the expansion of production capabilities, which is increasingly necessary to meet the demands of worldwide customers. Furthermore, robots are more efficient in many areas, such as the assembly line and picking and packing departments. As a result, they can greatly reduce turn-round times in many areas of the business operation”.

This indicates that robotic manufacturing can boost productivity because machines do not get tired or need time to stop working and eat. In addition, implementing robots and AI to work helps reduce workload for humans, minimizing the health impacts that can be caused by longer work hours. Robots are also more efficient at specific areas such as assembly lines, picking up things, or moving them from one place to another. In summary, AI is improving productivity by reducing health risks to human workers and other factors such as automation.

4.2 AI reduces errors

Humans sometimes make decisions based on the situation, environment, emotion, and beliefs, while AI makes decisions based on the data being given. According to Ribeiro (2021), *“Error reduction — after being trained, intelligent algorithms can perform very well tasks that are susceptible to errors in processes executed by humans. Since algorithms are not susceptible to external factors, they should be unlikely to suffer these factors’ consequences”*. This supports that AI, once appropriately trained, can minimize errors being made at their assigned job. Because AI uses algorithms and has no emotions, it is more likely to make fewer mistakes than human beings. Colson (2019) stated that *“AI can be trained to find segments in the population that best explain variance at fine-grain levels even if they are unintuitive to our human perceptions.”* It points out that AI can find connections between data and provides the best decision to choose. Colson (2019) also continued that, *“AI has no problem dealing with thousands or even millions of groupings. And AI is more than comfortable working with nonlinear relationships, be their exponential, power laws, geometric series, binomial distributions, or otherwise”*. It proved that AI makes decisions based on data being provided, and they have no issues dealing with the data to get a reliable result. Humans, however, might make assumptions in certain situations when making decisions. Sometimes, the environment, feeling, anxiety or stress, relationship, or healthiness might affect a person’s decision-making. Because AI is clear from mentioned factors, their decision-making is advantageous. The following images from Colson’s article illustrate the process of AI making decisions and how it can be put together to work with humans (Figure 1).

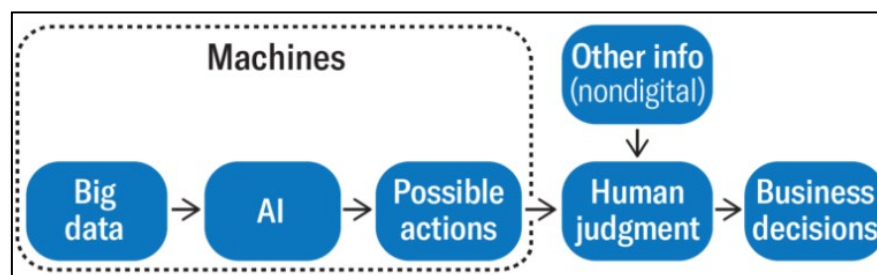


Figure 1. A Decision-Making Model That Combines the Power of AI and Human Judgement (Colson, 2019)

4.3 Revenue growth

In comparison to traditional industries, AI has the power to boost revenue growth in the industrial field. With minimal errors, which grants staff to focus on more vital operations, decision-makers will have much more time to focus on the core business strategy and leave other AI responsibilities to the robots. Companies like Tesla

and Johnson & Johnson, which rely on a globally integrated network, turn to AI start-ups. To improve the efficiency of their supply chains to provide real-time supply chain visibility, Core materials monitors one-off events, follows transportation, and records industrial products. Parts and components can provide early warning of possible problems and propose alternative solutions by evaluating more than 10 million occurrences every day and US\$25 trillion in products in real-time. According to Purdy and Daugherty (2017), by 2035, AI can boost economic growth rates by 1.7 percentage points on average across 16 industries. The following graph from Statista illustrates the revenue difference among different industries before and after AI implementation (Figure 2).

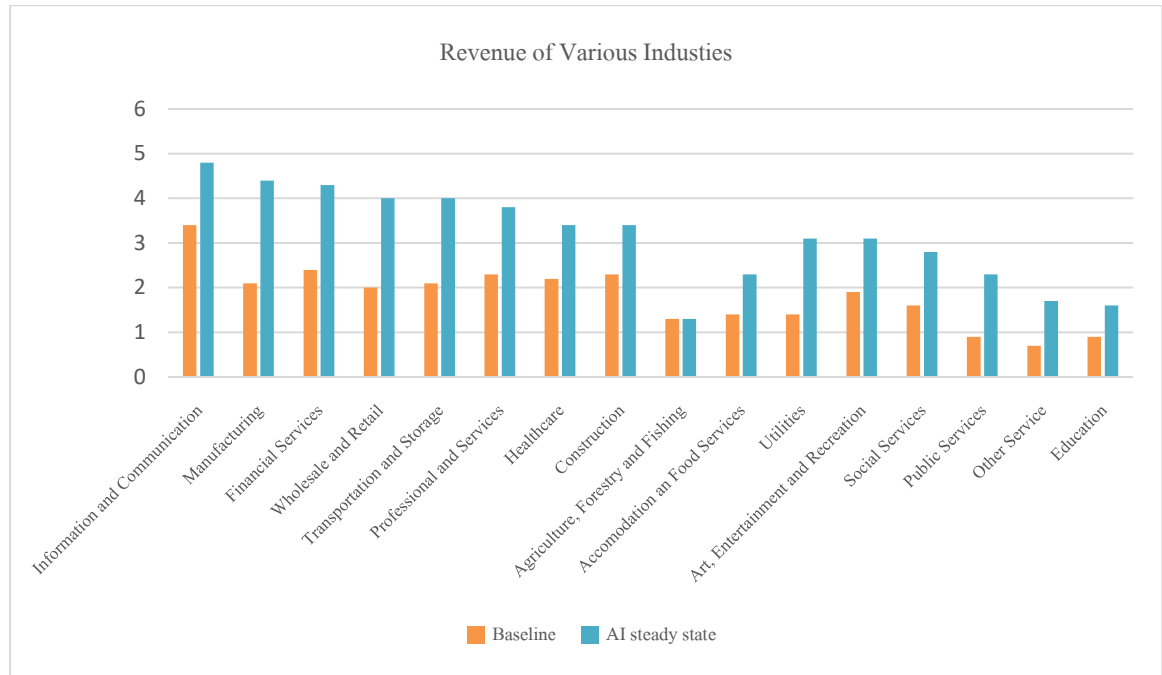


Figure 2: The impact of AI on industry growth (Statista, 2021)

5. Challenges and limitations of AI in industries

AI, like any new technology, has its own set of difficulties and disadvantages. These limitations involve a regulatory environment for disruptive new technologies like the healthcare industry with AI to keep humans from being harmed. Furthermore, the ethics of employing AI and the obligation of firms to recruit and retain their IT technicians for the AI revolution are hurdles the industry must overcome before becoming famous. Based on Anirudh's article, "*Artificial intelligence (AI) is an area of computer science that emphasizes the creation of intelligent machines that work and react like humans.*" AI's transformation was impacting many industries, from a standard factory to an industry. These factories have been altered as a result of the entry of AI-enabled industries into the digital market. Finance, healthcare, autonomous driving, retail, manufacturing, digital government, media, legal, agriculture, logistics, oil, and gas are just a few of the industries contributing to the growth. These firms have been transformed into AI-based industries, allowing the entrepreneurs to run their operations more efficiently, Deloitte (2019) stated in their article under the "*New Trends of AI Innovation and Integration*" session (Figure 3).

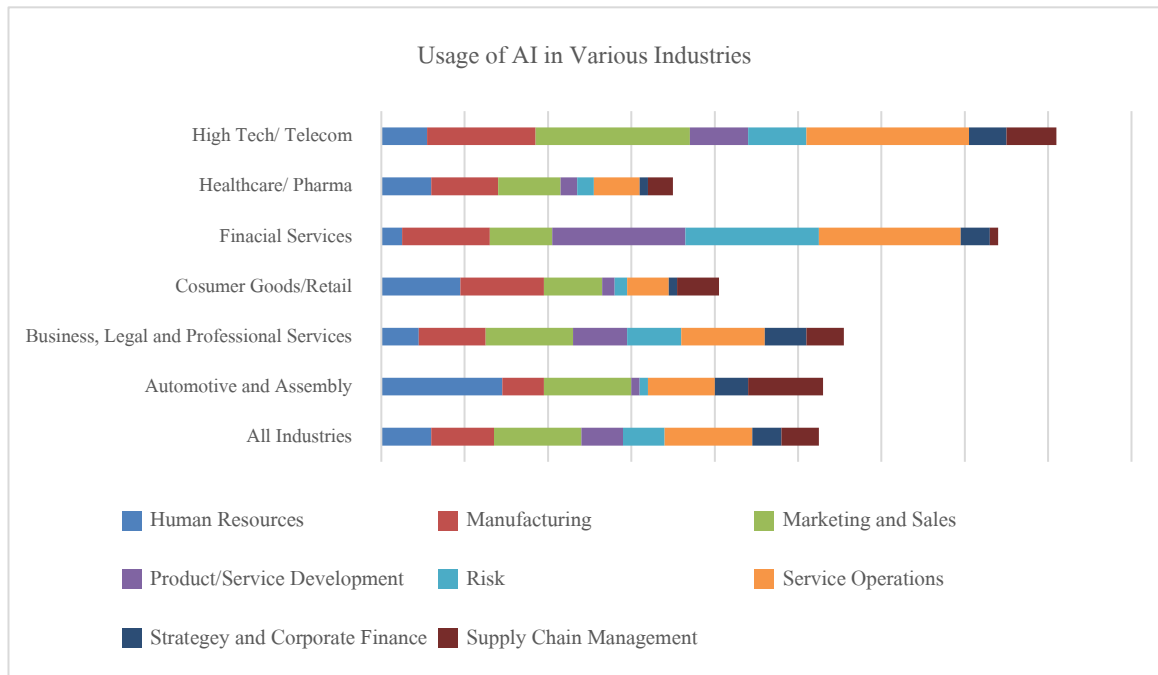


Figure 3: Usage of AI in various industries 2020 (Statista, 2020)

6. Future development of AI in Industry 4.0

AI implementation processes are becoming more and more digitally networked, resulting in extensive data collections. New technologies will allow these data collections to be analyzed and exploited, for example, by improving computing power and algorithms. Factory hall equipment also operates better compared to back to the days.

Furthermore, data communication has significantly become faster. As a result, the growing amount of available data was obtained and analyzed considerably quicker and more thoroughly than it used to be, and data analysis has grown much more intelligent. Because of the above reasons, AI will be implemented in different fields more extensively than it covers nowadays. One possible implementation could be a full hundred percent AI-only controlled factory or industry which requires no humans. For example, a car manufacturing company will have no human workers. Instead, AI will have access to all the cameras, machines, resources data, vehicle designs, budget, deadline, amount of product or customer order details. AI will analyze images and footage of a vehicle part and give commands to the machines whether to continue or cancel the following manufacturing process. Thus, AI gradually assumes the lead as the single most important driving force for technological transformation as it advances to the next level. Humans live in an era where machines can comprehend and predict what people desire or are likely to do in the future. It has opened up many possibilities, and what people have seen so far or may imagine in the future is a significant part of AI's real possibilities. Takyar (2018) illustrated in his article "*AI Applications Across Major Industries.*"

7. Conclusion

To sum up, the paper shows that AI in Industry 4.0 is improving various parts of various industries. Firstly, the article focuses on a discussion about how AI can strengthen industries. Secondly, AI is implemented in manufacturing to enhance areas such as speeding up productivity, reducing decision-making mistakes, and revenue growth. Thirdly, the challenges and limitations of AI are pointed out, showing the difficulties and problems faced while taking the AI-based industry path. Finally, the paper identifies the motivation factors and recommendations for the future development of AI in industry 4.0.

The authors suggested that AI has already changed many manufacturing industries and made life easier for manufacturing companies from the above discussion. AI technologies can be implemented in other areas, improving various aspects of the site applied. AI can enhance manufacturing by speeding up production, making accurate and vital decisions depending on the data acquired, or analyzing or simulating impacts before the events happen to see outcomes or problems. There are still some challenges in the implementation of AI at various levels. However, a decent number of companies are already using AI to ensure their product quality. Despite the cost of performance, the effectiveness of AI encourages companies to integrate them to be more accurate and effective in industries. AI technology's role is also incredibly significant for growth and implementation.

As a result, the paper investigated how AI has played a big role in industries, how it has improved productivity, how it helped reduce errors in decision-making, and how it is used in different platforms. The findings of this paper clarify that AI is becoming more reliable in various aspects and is improving in every aspect. So, from the above article, we can easily say that maintenance of factors, handling of limitations, and with the help of technicians, AI can play a significant role in the 21st century, and AI will be the leader with popularity and prosperity in the industry sector.

8. Suggestion

Some suggestions for improvements will include practical surveys or data about AI from host resources in the future article. For example, they are reaching out to the AI-based industry and studying the impacts of AI to show whether AI is effective or not. Another improvement will be interviewing owners of AI-based companies to obtain their idea and know the profits they earned from implementing AI in their industries. Finally, one possible improvement will be more academic articles to prove that AI is better. Therefore, more articles or research should be referred to in future research to minimize the biased outcome.

9. Acknowledgement

The authors would like to thank the honorable advisors, Associate Professor Dr. Todsanai Chumwatana and Associate Professor Dr. Krishna Chimmanee, Rangsit University International College's professors, who guided and supported composing this academic paper.

10. References

- Anirudh V. K. (2019). What is Artificial Intelligence: History, Types, Applications, Benefits, Challenges, and Future of AI. *TOOLBOX: TECH*. Retrieved from https://www.toolbox.com/tech/artificial-intelligence/tech-101/what-is-artificial-intelligence-history-types-applications-benefits-challenges-and-future-of-ai/#_015
- Colson, E. (2019). What AI-Driven Decision Making Looks Like. *Harvard Business Review*. Retrieved from <https://hbr.org/2019/07/what-ai-driven-decision-making-looks-like>
- Daley, S. (2021). *28 Examples of Artificial Intelligence Shaking Up Business as Usual*. BuiltIn. Retrieved from <https://builtin.com/artificial-intelligence/examples-ai-in-industry>
- Deloitte. (2019). *Global artificial intelligence industry whitepaper*, 105, p. 5). New trends of AI innovation and integration. Retrieved from <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/technology-media-telecommunications/deloitte-cn-tmt-ai-report-en-190927.pdf>
- King, R. (16, March 2020). 7 Benefits of AI in Manufacturing. *WEVOLVER*. Retrieved from <https://www.wevolver.com/article/7.benefits.of.ai.in.manufacturing>
- Lee, J., Davari, H., Singh, J., Pandhare, V. (2018). Industrial Artificial Intelligence for industry 4.0-based manufacturing systems. *ELSEVIER*. Retrieved from <https://www.sciencedirect.com/science/article/pii/S2213846318301081>
- Liu, S. (2021, April 6). AI Adoption in Organizations Worldwide 2020, by industry and function. *Statista*. Retrieved September 18, 2021, from <https://www.statista.com/statistics/1112982/ai-adoption-worldwide-industry-function>
- Purdy, M., & Daugherty, P. (2017). How AI Boosts Industry Profits and Innovation. *Accenture*, 25. Retrieved from https://www.accenture.com/fr-fr/_acnmedia/36dc7f76eab444cab6a7f44017cc3997.pdf
- Ribeiro, J. (2021, February 2). A (very) Brief Introduction to AI in the Industry 4.0. *Medium*. Retrieved from <https://towardsdatascience.com/a-very-brief-introduction-to-ai-in-the-industry-4-0-14e6f4b46cd1>
- Shahroom, A. A., & Hussin, N. (2018, September 9). *Industrial Revolution 4.0 and Education*, 8, 314-319. <https://pdfs.semanticscholar.org/12fb/a84f89c7d3bc9faf1a7402e1f6f741680354.pdf>
- Takyar, A. (2021). AI Applications Across Major Industries. *LeewaysHertz*. Retrieved from <https://www.leewayhertz.com/ai-applications-across-major-industries/>
- Wilson, G. (2020). *Top 10 companies using AI to enhance its manufacturing*. Medium: Manufacturing. Retrieved from <https://medium.com/manufacturing-global/top-10-companies-using-ai-to-enhance-its-manufacturing-92b3b13d61dd>
- World Health Organization. (17, May 2021). Long working hours increasing deaths from heart disease and stroke: WHO, ILO [Joint News Release]. (2021, May 17). Retrieved from <https://www.who.int/news/item/17-05-2021-long-working-hours-increasing-deaths-from-heart-disease-and-stroke-who-ilo>

YIELD AND NITROGEN CONCENTRATION IN CORN GROWN UNDER CONSERVATION AGRICULTURE CROPPING SYSTEM

Pengly Koun

**Master's Student, Department of Agriculture and Resources,
Faculty of Natural Resources and Agro-Industry, Kasetsart University, Chalermphrakiat
Sakon Nakhon Province Campus, Sakon Nakhon Province**

E-mail: kounpengly@gmail.com

Porntip Srimongkol

**Lecturer, Department of Agriculture and Resources,
Faculty of Natural Resources and Agro-Industry, Kasetsart University, Chalermphrakiat
Sakon Nakhon Province Campus, Sakon Nakhon Province**

E-mail: csnpstsk@ku.ac.th

ABSTRACT

The concerns on food security and environmental sustainability have increased interests in the last two decades. Conservation agriculture (CA) is an agricultural paradigm developed to increase agricultural sustainability, concomitant with conserving the environment. CA has three crucial principles, viz., minimum soil disturbance or no-tillage, maintain adequate amount of organic soil cover, and diversify crop species or rotations. The study aimed to quantify corn nitrogen concentration in conventional tillage cropping system versus conservation agriculture cropping system after one cropping season. This study comprised of three treatments viz., (i) conventional tillage (CT) of corn cropping system, (ii) conservation agriculture (CA1) corn cropping system that sunn hemp (*Crotalaria juncea* L.) is a cover crop and (iii) CA2 corn cropping system that sunn hemp, cowpea (*Vigna unguiculata* L.) and pearl millet (*Pennisetum glaucum* L.) is a mixture of cover crops. Results illustrated that total nitrogen content in corn grain under CA1 and CA2 were 3.9% and 0.9% respectively higher than CT, while total nitrogen in corn leaf was 2.8% lower under CA. CA1 and CA2 showed 7.1% and 3.1% greater grain yield than CT, respectively. Overall, this study suggested that CA system has better capacity for nitrogen uptake in grain leading to provide a better grain quality.

Keywords: Corn, Cover Crop, Conventional Tillage, Environmental Sustainability.

1. Introduction

The capacity to capture nitrogen resource plays a crucial role in achieving maximum crop growth. In corn (*Zea mays* L.) cropping system, nitrogen is the most limiting nutrient and has a great impact on crop productivity. The concerns on the sustainability of agricultural systems have increased recently. Conventional agriculture depends on intensive tillage management in combination with crop residue removal or burning have encountered adverse soil fertility declined (Dube et al., 2013). An appropriate tillage system associate with good nitrogen management might be an important approach to sustain soil fertility and crop productivity (Jug et al., 2019).

Conservation agriculture (CA) is a system of agronomic practices that improve biodiversity and biological processes above-and-belowground, which lead to enhance nutrient use efficiency and sustain crop productivity (FAO, 2017). CA practices include three important principles, such as non or minimum soil mechanical disturbance, maintenance biomass soil cover, and diversified crop species or cover crop rotation (Kassam et al., 2018). Cover crops are subjected as a crucial ecological tool for field crop production and soil fertility management (Chapagain et al., 2020). Application of leguminous cover crops in rotation with cash crop under CA system can contribute to in-situ availability of nitrogen in the soil (Derpsch et al., 2010). These cover crops can also enhance nitrogen content in the subsequent economic crop (Thorup-Kristensen et al., 2003). Graham et al. (2001) stated that CA can increase concentration of crop nutrition. Study on nutrient concentration in grain could understand the relation of soil nutrient replenishment via fertilization chemically or biologically (Heckman et al., 2003). However, only a few studies have conducted on the uptake of nitrogen by commercial crop like corn in different cropping system.

2. Research Objective

This study aimed to evaluate the influence of cover cropping on nitrogen concentration in corn leaf, stalk, and grain under both conventional agriculture and conservation agriculture cropping system after one cropping season.

3. Research Methodology

3.1. Study Location

The field experiment was conducted in upland area of Rathanak Mondul district, Battambang province, Cambodia (Fig. 1). The soil type in the study site is classified as Vertosols, which are black self-mulching clays (Belfield et al., 2013). The climate is tropical savanna, also identified as “Aw” by the Köppen-Geiger system. The mean annual temperature is 27.7°C, with a mean annual minimum and maximum temperatures of 22.2°C and 32.8°C, respectively (Climate.data.org., 2020).

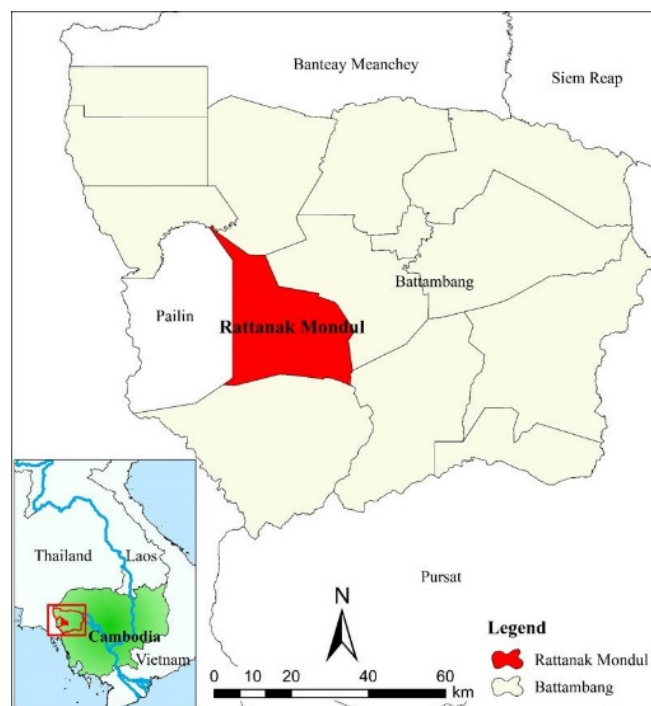


Fig. 1: Location of the study site

3.2. Treatments and experimental design

The experimental design of this study was in completely randomized design that had seven fields and each field is one hectare in size. Each field was equally slipped into three treatments: (1) conventional tillage (CT) corn-based cropping system that soil is fallow in off-season; (2) conservation agriculture (CA1) corn-based cropping system that sunn hemp (*Crotalaria juncea* L.) is a cover crop; (3) conservation agriculture (CA2) corn-based cropping system that sunn hemp, cowpea (*Vigna unguiculata* L.) and pearl millet (*Pennisetum glaucum* L.) are a mixture of cover crops. During off-season, cover crops were grown under both CA treatments two months before terminating and sowing corn. Fertilizer treatments were used uniformly across cropping systems at each trial field based on local fertilizer recommendations during corn growing season.

3.3. Corn sampling and plant analysis

Corn leaf sample was collected at the vegetative stage (ear leaf at early silking). The leaf collar method was followed the procedure of Abendroth et al. (2010). This growth period was crucial because it represents the high uptake of nutrients that have already happened in crop tissues, and uptake has started to plateau (Bender et al., 2013). There were three replicates per treatment. Twelve leaves were sampled and consolidated into one sample for each replicate. Each leaf collected below and opposite the ear node. Leaf sample was collected from plants, which are not damaged or free of diseases. Corn stalk and grain was collected during harvest period. Corn grain yield was assessed by collecting plants in quadrat of 0.6*4 meters. Six repetitions per treatment were assessed. All samples were put in paper bags and transferred to laboratory for drying at 50 °C until constant dry weight obtained. The grounded sample was then transported to the soil laboratory of Kasetsart University Chalermphrakiat Sakon Nakhon Province Campus for analysis. The total nitrogen of leaf, stalk and grain was

determined by the dry combustion method using elemental CN analyzer (CN 628, LECO Corporation; Saint Joseph, Michigan USA).

3.4. Statistical analysis

All statistical calculations of this study were performed with the SAS University Edition (SAS/STAT®, SAS Institute Inc, Cary, NC, USA). The graphs were generated with GraphPad Prism (8.0.1, GraphPad Software Inc., La Jolla, CA). The analysis of variance (ANOVA) was using Duncan's multiple range test to compare the mean differences at 95% confidence level. Correlation between nitrogen concentration in corn grain and corn yield were analyzed using the Pearson's correlation.

4. Results And Discussion

4.1. Impacts of cropping system on N concentration in corn leaf and stalk

Corn growth and N uptake are quick at the mid-vegetative growth stages, especially with enough soil moisture (Abendroth et al., 2010). The result of this study demonstrated that leaf N content under CT was observed 2.8% greater than CA, but there was no significant effect of cropping system (Fig. 2). Similarly, Habbib et al. (2016) recorded higher leaf N content in CT than in CA. This would be related to rapid redistribution of N from leaf to ears under CA. Stalk N content had illustrated no significant effect by cropping system even though there was 3% N higher under CT compared to CA2 (Fig. 2). Higher concentration would be linked to least favorable condition in CT that remobilized N to grain slower than CA (Ferreira et al., 2012).

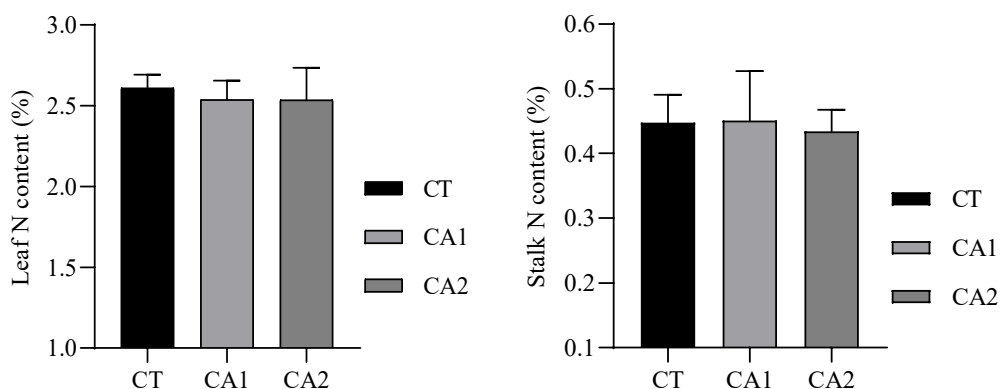


Fig. 2. Total N content in corn leaf and stalk under different cropping systems

4.2. Impacts of cropping system on N concentration in corn grain and corn yield

Cover cropping can improve N concentration in corn grain (Dube et al., 2013). In this study, we observed that N concentration in corn grain under CA1 and CA2 was 3.8% and 0.9% respectively greater than CT but not significantly different (Fig. 3). In line with the study of Habbib et al. (2016) who exhibited no significant difference of grain N content in both CT and CA. Wittwer et al. (2017) reported legume cover crops and a mixture of cover crop treatments exhibited greater N concentration in corn grain compared to nil-cover crop treatment. Kumar et al. (2015) investigated the impact of legume green manure under CA on wheat nutrient use

efficiency at the research farm of Rajendra Agricultural University recorded a high percentage of total N uptake in CA. They suggested this would be associated with favorable soil environment, good condition of root growth and better soil temperature that leads to improve translocation of nutrient absorption and as a result to increase nutrient uptake. Under less favorable environment in CT, there is commonly less nitrogen translocated to grain and N tends to have higher accumulation in stalk (Ferreira et al., 2012). Mosse (2002) described that percent N concentration of grains is a good indicator of the protein concentration of grains. This reflects that application of cover crops in CA treatment would increase protein content of corn grain, as a result it can provide better nutritional benefits to animal or grain quality.

A proper nitrogen management practice associate with suitable tillage regime is considered to enhance soil quality and at the same time to increase crop yield (Jug et al., 2019). It was observed that growing legume cover crops prior main crop provides positive effect on corn yield (Coombs et al., 2017; Franke et al., 2018). Our study demonstrated that corn yield under CA1 (7.1%) and CA2 (3.1%) had higher yield than CT even though it was not significantly different (Fig. 3). This is in conformity with the results of Blanco-Canqui et al. (2012) who found that sunn hemp can increase subsequent crop yield. This result is congruous with the meta-analysis study on the influence of cover crops and its subsequent crops by Alvarez et al. (2017) who found legume cover crops generally increased 7% or accounted for 0.65 t ha⁻¹ of corn yield. Wittwer et al. (2017) indicated that a significant increase of corn yield was primarily linked to the inclusion of nitrogen fixing cover crops. Another study in Malawi reported CA had higher corn yield than CT at early stage of the practice (Thierfelder et al., 2015). They mentioned that a favorable climate condition was an attribute to favor the yield gained. Crop yield increases or decreases is mainly based on environmental condition (Heckman et al., 2003; Ogle et al., 2012).

Pearson correlation analysis exhibited significant correlation between corn yield and corn N content (Fig. 4). Corn yield illustrated a significant correlation with corn N content at $P < 0.006$ (two-tailed) ($n = 21$, $R^2 = 0.58$). This finding is in agreement with the study of Ferreira et al. (2012) who observed that N concentration in corn grain and corn had a significant relationship.

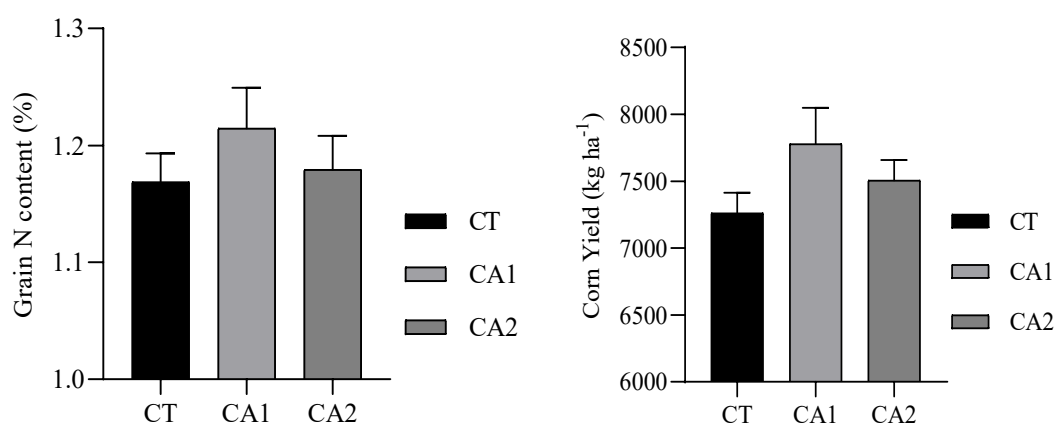


Fig. 3. Total N in grain and grain yield under different cropping system

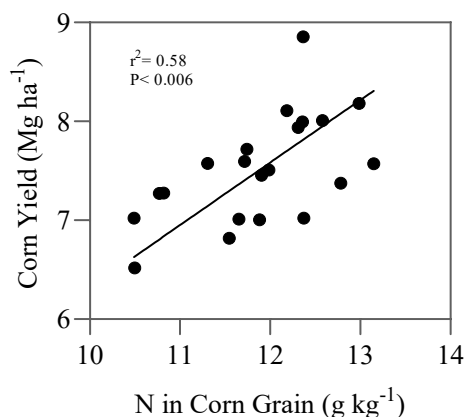


Fig. 4. Relationship between corn yield and N in Corn Grain

5. Conclusions

Inclusion of cover crops in cropping system is crucial for efficiency of nitrogen uptake in corn grain. In this study, conservation agriculture appeared to increase nitrogen concentration in grain and crop productivity. However, it is important to study the effect of long-term application of cover crop on grain nutrient concentration and its quality.

6. Acknowledgements

The study was partially supported by the Royal Scholarship under Her Royal Highness Princess Maha Chakri Sirindhorn Education Project to the Kingdom of Cambodia and by the Faculty of Natural Resources and Agro-Industry, Kasetsart University, Thailand.

7. References

- Abendroth, L. J., Elmore, R. W., Boyer, M. J., & Marlay, S. K. (2010). *Understanding corn development: A key for successful crop management*. Integrated Crop Management Conference, Iowa State University Cooperative Extension Service, Ames, Iowa, USA.
- Alvarez, R., Steinbach, H. S., & De Paepe, J. L. (2017). Cover crop effects on soils and subsequent crops in the pampas: A meta-analysis. *Soil & Tillage Research*, 170, 53-65.
- Belfield, S. C., Martin, R. J., & Scott, F. J. (2013). Alternative Cropping Systems for North-West Cambodia. *International Journal of Environmental and Rural Development*, 4, 209-214.
- Bender, R. R., Haegerle, J. W., Ruffo, M. L., & Below, F. E. (2013). Nutrient Uptake, Partitioning, and Remobilization in Modern, Transgenic Insect-Protected Maize Hybrids. *Agronomy Journal*, 105, 161-170.

- Blanco-Canqui, H., Claassen, M. M., & Presley, D. R. (2012). Summer Cover Crops Fix Nitrogen, Increase Crop Yield, and Improve Soil-Crop Relationships. *Agronomy Journal*, 104, 137-147.
- Chapagain, T., Lee, E. A., & Raizada, M. N. (2020). The Potential of Multi-Species Mixtures to Diversify Cover Crop Benefits. *Sustainability*, 12, 2058.
- Climate.data.org. (2020). *Climate Battambang*. Retrieved 29 August, 2021, <https://en.climate-data.org/asia/cambodia/battambang-1771/>.
- Coombs, C., Lauzon, J. D., Deen, B., & Van Eerd, L. L. (2017). Legume cover crop management on nitrogen dynamics and yield in grain corn systems. *Field Crops Research*, 201, 75-85.
- Derpsch, R., Friedrich, T., Kassam, A., & Hongwen, L. (2010). Current status of adoption of no-till farming in the world and some of its main benefits. *International Journal of Agriculture & Biological Engineering*, 3, 1-25.
- Dube, E., Chiduza, C., & Muchaonyerwa, P. (2013). Conservation agriculture effects on plant nutrients and maize grain yield after four years of maize–winter cover crop rotations. *South African Journal of Plant and Soil*, 30, 227-232.
- FAO. (2017). *Conservation Agriculture*. Retrived 29 August, 2021, from <http://www.fao.org/conservation-agriculture/en/>.
- Ferreira, C. F., Motta, A. C. V., Prior, S. A., Reissman, C. B., Santos, N. Z. d., & Gabardo, J. (2012). Influence of Corn (*Zea mays* L.) Cultivar Development on Grain Nutrient Concentration. *International Journal of Agronomy*, 2012, 1-7.
- Franke, A. C., van den Brand, G. J., Vanlauwe, B., & Giller, K. E. (2018). Sustainable intensification through rotations with grain legumes in Sub-Saharan Africa: A review. *Agriculture Ecosystems and Environment*, 261, 172-185.
- Graham, R. D., Welch, R. M., & Bouis, H. E. (2001). Addressing micronutrient malnutrition through enhancing the nutritional quality of staple foods: principles, perspectives and knowledge gaps. *Advance in Agronomy*, 70, 77-142.
- Habbib, H., Verzeaux, J., Nivelles, E., Roger, D., Lacoux, J., Catterou, M., Hirel, B., Dubois, F., & Tetu, T. (2016). Conversion to No-Till Improves Maize Nitrogen Use Efficiency in a Continuous Cover Cropping System. *PLoS One*, 11, 1-16.
- Heckman, J. R., Sims, J. T., Beegle, D. B., Coale, F. J., Herbert, S. J., Bruulsema, T. W., & Bamka, W. J. (2003). Nutrient Removal by Corn Grain Harvest. *Agronomy Journal*, 95, 587-591.
- Jug, D., Durdevic, B., Birkas, M., Brozovic, B., Lipiec, J., Vukadinovic, V., & Jug, I. (2019). Effect of conservation tillage on crop productivity and nitrogen use efficiency. *Soil & Tillage Research*, 194, 104327.
- Kassam, A., Friedrich, T., & Derpsch, R. (2018). Global spread of Conservation Agriculture. *International Journal of Environmental Studies*, 76, 29-51.

- Kumar, V., Kumar, M., Singh, S. K., & Chandra, S. K. (2015). Impact of Conservation Agriculture on Yield, Nutrient Uptake and Quality of Wheat Crop in Calciorthent. *Plant Archives*, 15, 371-376.
- Mosse, J. (2002). Nitrogen to Protein Conversion Factor for Ten Cereals and Six legumes or Oilseeds. A Reappraisal of Its Definition and Determination. Variation According to Apecies and to Seed Protein Content. *Journal of Agricultural and Food Chemistry*, 38, 18-24.
- Ogle, S. M., Swan, A., & Paustian, K. (2012). No-till management impacts on crop productivity, carbon input and soil carbon sequestration. *Agriculture, Ecosystems & Environment*, 149, 37-49.
- Thierfelder, C., Matemba-Mutasa, R., & Rusinamhodzi, L. (2015). Yield response of maize (*Zea mays* L.) to conservation agriculture cropping system in Southern Africa. *Soil & Tillage Research*, 146, 230-242.
- Thorup-Kristensen, K., Magid, J., & Jensen, L. S. (2003). Catch crops and green manures as biological tools in nitrogen management in temperate zones. In *Advances in Agronomy*, 79, pp. 227-302).
- Wittwer, R. A., Dorn, B., Jossi, W., & van der Heijden, M. G. (2017). Cover crops support ecological intensification of arable cropping systems. *Sciencfic Report*, 7, 41911.

AUGMENTED REALITY IN EDUCATION: USING AUGMENTED REALITY TECHNOLOGY TO ADVANCE HIGH SCHOOL EDUCATION IN BURMA

Mr. Aung Khong

**Information and Communication Technology Program, International College,
Rangsit University**

E-mail: aung.k62@rsu.ac.th

Mr. Thouk Dyna

**Information and Communication Technology Program, International College,
Rangsit University**

E-mail: thouk.62@rsu.ac.th

Mr. Hout Sakvongrith

**Information and Communication Technology Program, International College,
Rangsit University**

E-mail: hout.s62@rsu.ac.th

Assoc. Prof. Dr. Suttisak Jantavongso

**Information and Communication Technology Program, International College,
Rangsit University**

E-mail: suttisak.j@rsu.ac.th

ABSTRACT

There were fewer used educational technologies and education systems in Burma during the Covid-19 pandemic. In addition, an unstable political situation also affects the education and the future of high school students in Burma. This has resulted in the outdated development of the country and destroyed the future of students. This study aims to enhance the education system in Burma, help the students uplift their active participation in the classroom, and promote the United Nations Sustainable Development Goal (UNSDG) number 4. Quality education needs the utilization of Augmented Reality (AR), an upcoming technology running by superimposing computer-generated images onto physical objects that can be seen via smartphone applications. As a result, high school students, teachers, and outside learners acquire their education in fun and creative ways. This study also investigates the educational challenges the students have been confronting during this Covid-19 pandemic and analyzes them and needs to utilize an AR to handle their learning problems. The findings reveal that the AR technology can draw the attention of the students and teachers to study, whether outside or inside of the classroom, and help them improve their Intelligence Quotient (IQ).

Keywords: Education Reform, Educational Technology, Augmented Reality, Burma, Covid 19, Political Crisis

1. Introduction

In the 21st century, technology has become the primary tool in every sector, such as business, education, security, and it makes the world better. Also, advances in technology can drive globalization and digital transformation. In this Covid-19 pandemic, technology is becoming more important because people have to stay inside and work from home with technologies to protect themselves from the Covid-19. Augmented Reality (AR) technology is an upcoming technology. AR is running by superimposing computer-generated images onto physical objects that can be seen via smartphone applications, has also become a vital part of teaching and learning at home, and is a very supportive technology for reform to promote quality education. But the education system of Burma is a rote learning system that mainly focuses on memorizing so that students are weak at critical thinking skills. Li (2021) shows that *“the education system of Burma is mostly teacher-centric, leaving students to obey the orders of the teachers, with little emphasis on independent thought. Students don’t have the confidence to pick up anything, and this is what we want to tackle.”* In addition, using technologies in the classroom as the teaching and learning materials are very fewer. The students have memorized all the lessons that were taught, which they forget after the examinations. As the Covid-19 came to Burma, the students and teachers, especially from high schools, started experiencing difficulties using technology to overcome educational challenges during the pandemic. As a result, the students are under pressure to adapt to the new normal. Most schools in Burma have stopped online and offline operations entirely, adding stress to a weak education system characterized by high drop-out rates and low enrollment. There are other systematic issues, such as outdated curricula and ineffective government assistance. This paper argues that the outdated education system for the high school of Burma must be changed and integrated with technologies, especially AR, which can enhance quality education and draw the students’ attention in the classroom and at home. The paper first discusses the high education system in Burma, the United Nations Sustainable Development Goal (UNSDG) with AR, the challenges that the students face, and finally, it addresses how to examine an AR for education.

2. Objective

There are two main research objectives as follows:

1. to investigate the educational challenges that the students have been confronting during the Covid 19 pandemic; and
2. to analyze these (the above) challenges and utilize an AR to handle their learning problems.

3. The country context and high school system in Burma

Burma is one of the developing countries and is trying to reform its education system into a better one after a new government was elected in 2015. Fifty years ago, Burma was in a dictatorial regime and was cut off from the rest of the world. Its current educational system cannot prepare the young generation to tackle new difficulties, and its teachers are not provided to educate 21st-century learning skills. Rote learning, a

memorization technique based on repetition, is the solution to its current educational problem, but it keeps students from being creative thinkers and motivated and proactive learners.

Proof of victorious educational reform from other developing countries suggests that a teacher's professional development is one of the crucial levers for enhancing education's quality. In developing countries like Burma, Laos, and so on, there is a lack of skills, expertise, and knowledge for developing teachers. Experiential one-on-one mentoring and acquiring expert teachers are treasures the country cannot afford. Burma confronts skilled and financial human resources restrictions though these practices are the most impactful (Taungani, 2018).

Moreover, its old education system, mainly focused on the by-heart system, made the students' futures and development outdated. In the high schools of Burma, educational technologies such as computers, online platforms, projectors, projector screens, and so on are not provided very much for teaching and learning. Just some schools can use educational technologies for teaching and learning. Since the Covid-19 came to Burma, the situation was getting worse. Most of the schools and public places have been closed until now. With the Covid-19, education systems were needed to adopt online learning. But the students are under pressure when it is time to adapt to the new normal. Most of the schools in Burma have stopped operations offline entirely, and some have ended online as well, adding stress to a weak education system that is characterized by high drop-out rates and low enrollment. Other systematic issues include outdated curricula and ineffective government aid (Li, 2021).

Unfortunately, the situation in Burma was getting worse starting February 1st, 2021 because of the military coup. Almost all students in Burma did not attend the schools by participating in Civil Disobedience Movement (CDM), including the teachers. Therefore, online teaching and learning at home have become the safest way to pursue education with educational technologies from the pandemic and political crisis. And also, it is time to reform and enhance the education system that was trapped for a long time with technology even though the learning and teaching system is online. Hence, some international and domestic organizations related to the education sector of Burma, such as 360ed and the United Nations International Children's Emergency Fund (UNICEF), are still contributing educational technologies and materials for the students. This is challenging because of a prolonged political crisis. So, the students also cannot stop learning (Dee, 2020).

In Burma, grades 10 and 11 are regarded as high school. And grade 11 (standard 10) is a bridge to step to the university or college so that almost every parent and the student takes matriculation examination very seriously to achieve a high school diploma (Dee, 2020). Only if the students pass with distinctions or highest grades in high school can they attend medical, engineering, and maritime universities. But right now, all of the students, including high school students, are confronting educational challenges and worrying if they could continue their education on campus or not.

3.1 What is AR technology?

AR is what it sounds like: reality, enhanced with interactive digital components. The most commonly used AR applications rely on smartphones to show the digitally augmented world. Users can activate a smartphone's camera to see the real-world around them on the screen and rely on an AR application to improve

that world in many ways through digital overlays: add real-time directions, superimpose images, digital information or 3D model, change colors, insert labels, alter the users' appearance through "filters" on Snapchat, Instagram and other apps (Houston, 2020), see Figure 1.

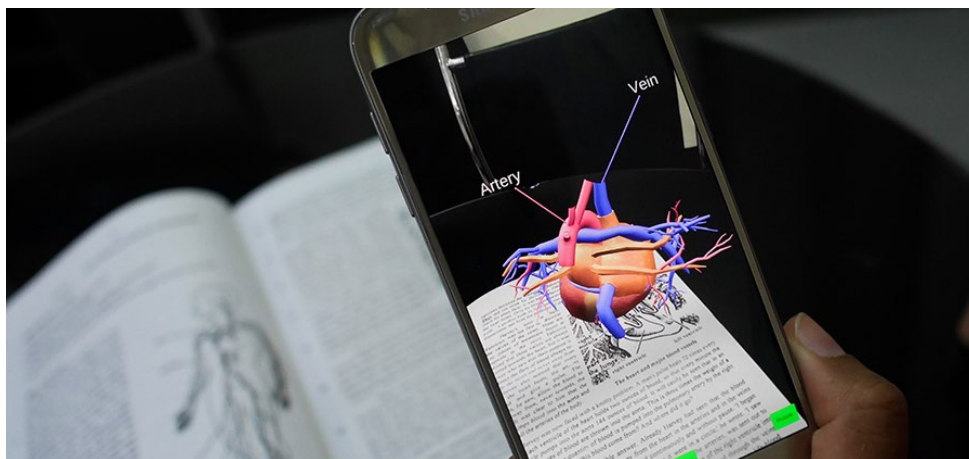


Figure 1. Viewing the blood circulation system chapter from grade 10 English textbook via a smartphone (Paing, 2017)

3.2 AR in the classroom

AR is completely changing the way users see the world and has found its way into many aspects of life. One of the crucial aspects of these is education. AR in education lets students and teachers obtain knowledge through immersion and rich visuals into the subject object (Sinha, 2021). Thus, it expands students' ability to acquire curricular subjects while lessening the time spent learning to utilize the new technology. In addition, it offers two-dimensional methods of presenting information versus the traditional one-dimension. This integration of interactivity and engagement with emotion, in turn, could improve the students' ability to remember what they have acquired and led to faster acquisition of skills and information. However, a minimal setup for an AR for almost any classroom may include mobile devices, internet connection, AR application, and triggers or makers, i.e., objects, objects, locations, or actions that trigger a step on the device screen through the AR application (Rajawat, 2020; and Kesim & Ozarslan, 2012).

4. UNSDG number 4 with AR

Among 17 UNSDG goals, the UNSDG number 4 is a goal that aims to “*ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030*” (The United Nations, 2021). The educational materials or technologies, which are parts of quality education, are also crucial to promote quality education. Nowadays, some high schools have started utilizing AR technology for studying and teaching, whether in the classroom or online. AR technology can help to enhance memory, sensory development, content understanding, collaboration, student engagement, learning environment, and cost-effectiveness, especially during the Covid-19.

Therefore, the Burmese government and other non-governmental organizations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) and Cotton on Foundation should invest budgets for AR technology in the high school. Because high school students in Burma currently need technology such as AR to tackle the challenges such as being less concentrated on the lessons and unclear lessons during this pandemic and political situation. Thus, utilizing AR supports promoting the education system in Burma and the UNSDG number 4, which is running for the long term.

5. Educational challenges in Burma

Since the Covid-19 pandemic came to Burma in 2020, all schools and institutions have been closed. The learning and teaching system was changed from on-campus to online. But the students faced the educational technology challenges such as how to use the online platform, difficulty catching up with the lessons, and sometimes unstable internet connection while learning in the online classes. According to Dee (2020), *“It is of utmost urgency that we continue our collaboration with the Ministry of Education in support of the COVID-19 Response and Recovery Plan, to find innovative hi-tech, low-tech, and no-tech solutions to ensure the continuity of education for all learners in Myanmar, especially for the most vulnerable children and youth.”* After the unexpected military coup on February 1st, 2021, the schools closed, and students from some regions of the whole of Burma, including over 300,000 teachers, did not attend the school as protesting against the military coup. Currently, most students are learning with volunteer teachers from outside, such as university students and Civil Disobedience Movement (CMD) teachers. But for those who do not have volunteer teachers, it is still hopeless for their education.

When teaching online via Zoom, Google Meet, Microsoft Team, and WebEx to the students, the internet connection problem sometimes happens so that most of the students are struggling to catch up with the school lessons. Moreover, some students still struggle to use the online platform for their studies because of a lack of technical knowledge. Li (2021) states, *“in a country where a large number of the population still lacks a foundation in digital literacy, online platforms like Zoom and Google Classroom are not yet the panacea of learning. 46% of university students opposed online classes due to lack of reliable access to the internet or computers, according to a survey conducted by the All Burma Federation of Student Unions in May.”* However, lack of technology is not a big problem because it is easy to learn from teachers, friends, and parents in the Information Technology (IT) sector. Currently, because of not enough teachers, most high school students cannot follow their lessons effectively, especially Biology, Chemistry, and Physics subjects taught in high school. All of these three are practical subjects, and some of them, such as Biology and Chemistry, have to be done in the laboratory room to see and understand the lessons.

However, the best and safest way to study and teach for the teachers and students in Burma is online. Therefore, as mentioned above, the students and teachers need technology to help research, teach and tackle the challenges during this challenging time.

6. Solution for the Challenges

Educational reform has been carried out concerning combining technology in daily class practices at the higher education level in Burma. Digital classrooms and digital technologies have become the most significant and active challenges in the education sector (Khin, 2021). To handle the students' challenges in Burma, it needs to use technology to draw the students' attention to lessons. Thus, for this problem, AR can assist in studying and enhancing the teaching skills of the teachers. AR is a technology that allows people to superimpose digital content over a real-world environment. Unlike Virtual Reality (VR), it won't be immersed in an artificial environment. Therefore, AR technology is very supportive of education.

In high schools, there are six subjects that the students must take. But depending on the interests (Arts and Science streams), the three subjects among the seven subjects have been different. Burmese, English, and Mathematics are the compulsory subjects, and for the Arts and Science, the students can choose either. Biology, Chemistry, and Physics subjects are for the Science stream, and Geography, History, and Economics are for the Arts stream.

According to the research, mainly the three subjects of the science stream are the practical subjects. For these three subjects, AR technology can tackle the challenges the students face during an online class. Moreover, most high school students in Burma can afford to have at least a smartphone, so it is easy to use for AR. AR can advance interactive experiences with coursework, inspire collaboration between students, enhance motivation, and increase acquiring gains, sensory development, and concept over rote learning (Mack, 2021). These benefits all rely on effectively executing AR into the classroom. When combined poorly, AR confronts many limits, including too much focus on the intrusion of the technology and virtual information onto actual learning gains (Wu, Lee, Chang, & Liang, 2013).

Also, Burmese schools mostly run with a rote memorization education system so that the students memorize all of the lessons that were taught in the classroom and forget after the exams. Thus, it is not the most effective to teach and learn, and students are getting weak in critical thinking skills. To reform this kind of education system, AR can help an education system where students can think with their brains. There are lots of lessons, games, and activities in AR technology that enhance IQ and critical thinking skills.

For instance, biology AR technology is beneficial for the students when studying the blood circulation system, human skeleton, human eye optical system, nervous system, etc. These give the users an insight into the 3D-AR representation of systems, body parts, and animals. Moreover, students and teachers can realistically experience biology subjects and improve at their own pace by labeling: self-test sections, drawing, chapter summaries, and multimedia narrated by Burmese and English. Even though the school textbooks are not brought in the classrooms or online classes, the students can look at their lessons on the AR flashcards while teaching at the same time. The biology textbooks of high school in Burma do not have color in any pictures, but the AR flashcards are full of colors that can concentrate on the lessons (Figure 2).



Figure 2. The human eye optical system (EdTech Social Enterprise, 2021)

There are many benefits that both the students and teachers can gain by utilizing AR as an educational technology:

- can be accessed by students and learners anywhere, using their own devices;
- can swiftly recruit to resuscitate existing materials;
- assists teachers and training providers to carry complex subjects;
- does not need learners to buy sophisticated materials;
- helps to draw concentration on a particular item for longer; and
- improves it by giving an alternative visual learning chance

The most exciting benefit is students' enthusiasm about utilizing AR when acquiring. A high eagerness to engage with AR experiences is noted in many research studies where users report feeling having more fun, higher satisfaction, and being more willing to repeat the AR experience. Curiously, user motivation remains remarkably high for the AR systems (vs. the non-AR alternative) even when the AR experience is more difficult to utilize than the non-AR alternative.

Moreover, it also needs to teach 21st-century knowledge and skills to students and empower students with new chances, dreams, and goals, assisted by digital tools and 21st-century acquiring environments to receive a world-class education from world-class teachers. When teaching in the classroom, teachers only have to give the books, and students can scan the book pages, bringing them to life on their smartphones. This means fewer preparation times for teachers. According to resources, the availability means teachers only have to print out enhanced worksheets if they want their students to take the augmented experience at home. The teacher can print pre-made AR sheets, making it more convenient for teachers to create AR into their preparations.

Thus, not only can AR help the students' necessities, but it also gives teachers chances to assist students in grasping abstract concepts. In addition, by using AR technologies' experimentation and interaction, teachers can improve classroom experiences, educate new skills, inspire student minds, and get students excited about exploring new academic interests (Maryville University, 2021). There is an EduTech venture producing and inventing technologies such as AR, VR, and so on for education in Burma. It is called 360ed. This organization is also trying to contribute to the technologies for students across Burma. Also, to reform the education system

of Burma and tackle the challenges that the students and teachers have been confronting, AR is a stepping stone for the young generation to step forward to the future. Not only it is for during this pandemic and unstable political crisis in Burma, but it will also be a very supportive and helpful educational technology for any learners and educators who are trying to reform the education system even though the pandemic is gone, and freedom is finally in the hands of people in Burma.

7. Conclusion

Educational technology and old education systems in Burma, the Covid-19 pandemic, and the unstable political situation affect the education of high school students and their future. This has resulted in the outdated development of the country as well. Therefore, the solution is clear: to focus on teaching and learning. Learning both online and offline classes can promote the education system of Burma and UNSDG number 4. High school teachers and students have to use AR technology for their subjects during this period.

“Should we stop learning during this struggling time?” This is a common question that every person has in their mind right now in Burma. Even though Burma faces the Covid-19 and political crisis, learning must not stop because education cannot wait. People in Burma must go on. Hence, a technology called AR is needed to tackle the challenges of teachers and students in the online classroom or at home.

AR could bring massive advantages to high school students in Burma from all different grades. AR in education lets students and teachers obtain knowledge through immersion and rich visuals into the subject-object. Thus, it expands students’ ability to acquire curricular subjects while lessening the time spent learning to utilize the new technology. Still, the main objectives to AR technology in education are cost and tech, as a minimal setup for any classroom may include: the Internet connection for AR, mobile devices to use for AR, and AR applications.

AR is becoming more accessible, cost-friendly, essential, and practical, including grounding schoolchildren with the knowledge and competencies required to cooperate with others and succeed in future careers. Therefore, AR technology can lead to the country’s development and change the students’ futures, and the Burmese government and ministry of education must consider utilizing AR technology in reforming the education system of Burma. Furthermore, in an unfortunate case like Covid-19 Pandemic or similar circumstances, technologies such as AR could prove to be the game-changer as it provides a unique but more than a capable way of replacing practical teaching or learning skills. This expands a broader range of possibilities to exploit to gain and improve knowledge of one; thus, it is beneficial for the present and future of the educational sector as a whole. Therefore, the authors believe that AR technology is a very supportive educational technology that can advance the high school education of Burma, enhance the education system and tackle the challenges for learning and teaching of the high school students and teachers at home during this struggling time.

8. Suggestion

High Schools of Burma can utilize digital resources in different ways to help teaching and learning. Ranging from grading, online sessions, learning games, and teacher and student performance analysis are a few ways technology can power learning. In this sense, technologies like AR should be considered and adopted into all levels of education with time and resources. To have a chance of success, government or private organizations must be heavily involved in the process, thus giving the technology a huge opportunity. AR technology provides students with access to accelerated learning by providing a window to the world and access to thousands of learning resources.

As mentioned above, there are a lot of benefits of using AR during this pandemic time. AR is the best technology for high school students because there are a lot of practical subjects, and it gives an insight into the 3D-AR of the lessons. For these reasons, students should use AR for their studies and preparation for the matriculation examination. Furthermore, with AR technology in education, students can reach a higher capability to increase content understanding, hold structure and functionality, and improve collaboration and motivation (Prochazka & Koubek 2011). Even though the schools have been closed, and there are not enough teachers, the students cannot stop learning so that

To implement this AR in school, students, teachers, parents, governments, policymakers, and the media must share the same belief and willingness to reinforce leapfrog Burma's education system. They should get involved to succeed goals, and they need strategic industrial partners, talented individuals, and visionary leaders who can foresee and paint the education's future with them.

9. Acknowledgment

The authors would like to thank the honorable advisors, Associate Professor Dr. Todsanai Chumwatana and Associate Professor Dr. Krishna Chimmanee, who guided and supported throughout the composing of this academic paper.

10. References

- Dee, N. R. M. (2020). *Learning lessons Covid-19 in Myanmar*. [Online]. Retrieved August 5th, 2021, from:
<https://news.un.org/en/story/2020/10/1074602>
- EdTech Social Enterprise (2021). *High School Biology AR*. [Online]. Retrieved October 5th, 2021, from:
<https://www.360ed.org/high-school-biology>
- Houston, B. (2020). *What is Augmented Reality?* [Online]. Retrieved August 28th, 2021, from:
<https://www.threekit.com/blog/what-is-augmented-reality>
- Kesim, M., & Ozarslan, Y. (2012). Augmented reality in education: current technologies and the potential for education. *Procedia-social and behavioral sciences*, 47, 297-302.
- Khin, N. C. (2021). Integration of Technology in Higher Education in Myanmar: A Review of University Teachers' Perceptions of Barriers and Supports. *Technium Social Sciences Journal*, 15(1), 89-98.

- Li, S. P. (2021). *EdTech startups want to reform education in Myanmar, but systemic challenges hinder mass adoption*. [Online]. Retrieved January 6th, 2021, from: <https://kr-asia.com/edtech-startups-want-to-reform-education-in-myanmar-but-systemic-challenges-hinder-mass-adoption>
- Mack, S. (2021). *Augmented Reality in Education: Looking Forward*. [Online]. Retrieved April 30th, 2021, from: <https://www.emergingedtech.com/2021/04/augmented-reality-in-education-looking-forward/>
- Maryville University. (2021). *Augmented Reality in Education: Interactive Classroom*. [Online]. Retrieved September 15th, 2021, from: <https://online.maryville.edu/blog/augmented-reality-in-education/>
- Paing, T. H. (2017). *The Entrepreneur Bringing Virtual Reality to Burma's Classrooms*. [Online]. Retrieved September 5th, 2021, from: <https://www.irrawaddy.com/in-person/the-entrepreneur-bringing-virtual-reality-to-burmas-classrooms.html>
- Prochazka, D., & Koubek, T. (2011). Augmented reality implementation methods in mainstream applications. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 59(4), 257-266.
- Rajawat, N. S. (2020). *Importance Of AR Adoption in Education*. [Online]. Retrieved September 1st, 2020, from: <https://inc42.com/resources/importance-of-ar-adoption-in-education/>
- Sinha, S. (2021). *Augmented Reality in Education: A Staggering Insight into The Future*. [Online]. Retrieved January 2nd, 2021, from: <https://elearningindustry.com/augmented-reality-in-education-staggering-insight-into-future>
- Taungani, P. S. (2018). *360ed Myanmar: Using Technology to Advance the Country's Educational System*. [Online]. Retrieved September 30, 2021, from: <http://www.changemag-diinsider.com/blog/360ed-myanmar-using-technology- to-advance-the-country-s-educational-system>
- The United Nations. (2021). *No. 4 Equality Education*. [Online]. Retrieved September 2nd, 2021, from: <https://www.un.org/sustainabledevelopment/education/>
- Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). Current status, opportunities and challenges of augmented reality in education. *Computers & Education*, 62, 41-49.

DETERMINATION OF β -CAROTENE IN *MUSA SURIER* L. AND *MUSA SAPIENTUM* L. PULP AT DIFFERENT RIPENING STAGES BY HPLC

Akharapong Krueajan

Master of Science (Pharmaceutical chemistry and natural product)

Graduate School, Naresuan university

E-mail: akharapongK@gmail.com

Kongaphisith Tongpoolsomjit. Ph.D.¹

Jurupa Viyoch. Ph.D.²

¹Department of Industrial Chemistry, Faculty of Applied Science,

King Mongkut's University of Technology North Bangkok, Bangkok, Thailand

²Department of Pharmaceutical Technology, Faculty of Pharmaceutical Science,

Naresuan University, Phitsanulok, Thailand

ABSTRACT

Musa surier L. (Musa AA (var.), Kluai Khai) and *Musa sapientum* L. (Musa ABB (var.), Kluai Nam Wa) are banana cultivars that have been valued as crops for either the local or the export market in Thailand. They were evaluated according to their total soluble solids (TSS) and β -carotene content in fruit pulp according to their 4-ripening stage (green, greenish, yellow, and yellow, flecked with brown). TSS was found to be correlated with the ripening stages. Carotenoids were extracted from banana fruit pulp by using 500 μ L of 0.25% butylated hydroxytoluene in tetrahydrofuran: methanol (1:1, v/v). β -Carotene from the banana pulp was separated and analyzed by using RP-HPLC (C18, 96 250x4.6 mm, 5 μ m) at room temperature. The 10% ethyl acetate: methanol (1:1, v/v) in acetonitrile was used as mobile phase. The HPLC chromatogram displayed the highest β -carotene content in *M.surier* L. and *M.sapientum* L. at stage 4 (yellow, flecked with brown) as 4148.35 ± 155.10 and 611.5 ± 42.27 μ g/ 100 g of fresh weight, respectively. The increased TSS according to the changed of banana peel from state 1 to state 4 was associated with an increase of β -carotene content in *M.surier* L. On the other hand, β -carotene content in *M.sapientum* L. was hardly increased when compared to *M.surier* L. This study might be useful to selecting banana cultivars for further development, such as in nutraceutical formulation or dietary supplements.

Keywords: β -Carotene; *Musa surier* L.; *Musa sapientum* L.; Kluai Khai; Kluai Nam Wa

1. Introduction

Consumption of healthy food helps to prevent various chronic noncommunicable diseases, such as cardiovascular disease, diabetes, cancer, and human skin disorder (WHO., 2020). However, ultraviolet radiation exposure can stimulate the production of free radicals leading to skin disorder. To protect skin from this occurrence, free radicals must be controlled and balanced by antioxidants which can be obtained from various natural sources. Fruits are one of important sources of natural antioxidants (Petruck et al., 2018)

Carotenoids, a group of pigments found in fruits and vegetables, are one of the most effective natural antioxidants (Yabuzaki, 2017). β -carotene, a member of the carotenoid group, is C₄₀ hydrocarbons with a molecular weight of 536.9 g/mol and a molecular formula of C₄₀H₅₆ (Yabuzaki, 2017). It was previously reported to have protective effects against UV radiation (Grether-Beck et al., 2017).

There are many beneficial fruits today. One of the most popular fruits with good health benefits is bananas. Bananas (*Musa* species) fruit pulp has been found to contain a lot of β -carotene, in addition, they are also classified based on the genome groups. Genomic combinations are formed from basic chromosome numbers that can present genome, resulting in different varieties of bananas. Thai bananas such as *Musa surier* L. (Kluai Khai) or *Musa sapientum* L. (Kluai Nam Wa) is an example of AA or ABB group, respectively (Rodriguez-Concepcion et al., 2018). The previous studies have revealed a significant level of phenolics as 304.8 ± 5.4 mg GAE per 100 g of fresh fruit in *M. surier* L. and 144.1 ± 5.0 mg GAE per 100 g in *M. sapientum* L. and found β -carotene as 79.20 ± 4.76 μ g per 100 g of fresh fruit in *M. surier* L. (Leerach et al., 2017; Viyoch et al., 2012). They also addressed effects of *Musa* AA pulp in UVB-induced mouse skin damage by increasing γ -GCS expression and reducing the accumulation of oxidation in end products.

In order to pay more attention to the Thai local banana, we selected *M. surier* L. (*Musa* AA (var.), Kluai Khai) and *M. sapientum* L. (*Musa* ABB (var.), Kluai Nam Wa) which are local banana in Phitsanulok and Kamphaeng Phet provinces. These bananas can also be an ingredient for nutraceutical or dietary supplements products requiring a specific content of β -carotene which depends on their ripening stage defined by peel color and TSS. Therefore, we were interested to determine the fruit pulp β -carotene content in *M. surier* L. and *M. sapientum* L. at various ripening stages to be a profile of bananas using a standard RP-HPLC method.

2. Research Objective

(1) To determine the fruit pulp β -carotene in different peel color stage of *Musa surier* L. (AA Group) and *Musa sapientum* L. (ABB Group) by using High Performance Liquid Chromatography (HPLC)

3. Research Methodology

Collection of banana fruit pulps

Bunches of fresh mature unripe banana [*Musa surier* L. (*Musa* AA (var.), Kluai Khai)] and [*Musa sapientum* L. (*Musa* ABB (var.), Kluai Nam Wa)] are purchased from Kamphaeng Phet and Phitsanulok province, Thailand. All bananas were left to be ripening at room temperature. Bananas were collected for each ripening

stage using peel color in 4 stages (s1 = green, s2 = greenish, s3 = yellow, and s4 = yellow, flecked with brown). Three bananas were randomly selected in the same bunch to test for total soluble solids (TSS) content. After that, the fruit pulp was prepared for lyophilization. The four ripening stages of the banana were determined for TSS at the middle of the fruit. TSS measurements were carried out in this experiment by using a portable refractometer (Trans Instrument, RBX0080).

Lyophilized banana fruit pulp powder preparation

The pulp was lyophilized by using a freeze dryer for 72 hrs. (Heto Model Lyolab 3000, Thermo Electron Corporation, Mukarov, Czech). The lyophilized pulp was kept in a moisture-proof, vacuum and light protect sealed package in a cool and dry place until used. The source information, ripening stage, collection, and lyophilization date was addressed on the label of the package. The lyophilized fruit pulp was pooled and homogenized to a fine powder by a blender and kept in a light-protected package at -20° C and dry condition for further studies.

Extraction of carotenoids

The extraction method was modified from the previous studies (Davey et al., 2006; Drapal & Fraser, 2019; Tongpoolsomjit et al., 2020). 500 µL of 0.25% butylated hydroxytoluene in tetrahydrofuran: methanol (1:1, v/v) was used to extract 50 mg of powdered banana pulp in 2 mL microtube. Then, the suspensions were homogenized by a vortex mixer for 30 sec and centrifuged for 15 min at 14,000 rpm. After that, the supernatant was collected. The extraction methods were repeated twice more. The extractions were filtered through disposable 0.45 µm filters before RP-HPLC analysis.

RP-HPLC analysis of β -carotene

The β -carotene extraction was analyzed by RP-HPLC using a Shimadzu LC-20AT system on Hyper Clone (Phenomenex) (C18, 96 250x4.6 mm, 5µm) at room temperature. The 10% ethyl acetate: methanol (1:1, v/v) in acetonitrile was used as mobile phase, isocratic run, at a flow rate of 1 mL/min and using the injection volume were 25 µL. A photodiode array detector was used to monitor the signal at 450 nm. The results of the experiment were compared between the β -carotene standard curves to determine β -carotene content in the powdered banana pulp. The conditions used in this method were modified from the previous study (Tongpoolsomjit et al., 2020).

4. Research Findings

Preparation of Lyophilized banana fruit pulp

After Lyophilization, the yellow of *Musa surier* L. powder was more intense than that of *Musa sapientum* L. In Table 1, an average yield of *M. surier* L. and *M. sapientum* L. were 79.25% and 80.25%, respectively, and showed an increase of total soluble solids (° Brix) of different peel color in s1 to s4 of *M. surier* L. and *M. sapientum* L.

Determination of β -carotene content in banana fruit pulp

Revers- phase high- performance liquid chromatography (RP- HPLC) coupled with diode array detection (DAD) were used to quantify β -carotene in *M.surier* L. and *M.sapientum* L. extract and *standard* β -carotene. The HPLC separation chromatogram displayed standard β -carotene peak at approximately 20.0 min. The standard peak was compared with the peak of *M.surier* L. and *M.sapientum* L. peak which had similar retention time (Figure 1). The linear regression line of the standard curve β -carotene is $y = 107.31x - 11618$ ($R^2 = 0.9994$) for determined β -Carotene content in *M.surier* L. and $y = 128.14x - 1610.7$ ($R^2 = 0.9995$) for determined β -Carotene content in *M.sapientum* L. The calculated amount of β -carotene content in *M. surier* L. and *M. sapientum* L of each ripening stage ($\mu\text{g}/100\text{ g}$ of fresh weight) shown in table 2.

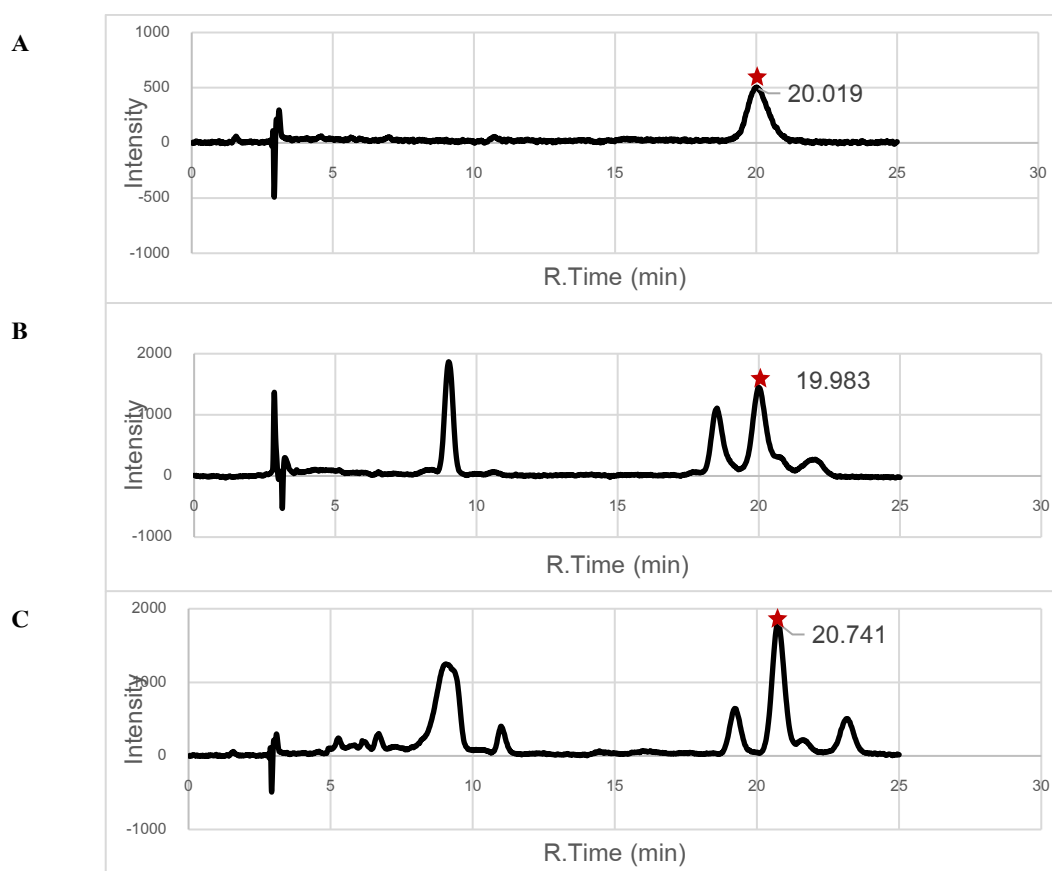


Figure 1. The HPLC chromatograms of (A) Standard β - carotene, (B) *Musa surier* L. and (C) *Musa sapientum* L.

Table 1. Total soluble solids (°Brix) and %yield form 4-ripening stages in each bunch.

<i>Musa surier</i> L.			<i>Musa sapientum</i> L.		
ripening stages	total soluble solids (°Brix)	%yield	ripening stages	total soluble solids (°Brix)	%yield
N1	s1	3	N1	s1	2
	s2	18		s2	17
	s3	25		s3	24
	s4	28		s4	27
N2	s1	5	N2	s1	3
	s2	21		s2	19
	s3	25.5		s3	24.5
	s4	28		s4	28
N3	s1	3	N3	s1	2.5
	s2	22		s2	18
	s3	26		s3	25
	s4	29		s4	27
N4	s1	3	N4	s1	4
	s2	18		s2	20
	s3	24		s3	24
	s4	28.5		s4	26

(s1 = green, s2 = Greenish, s3 = Yellow, and s4 = yellow, flecked with brown, n: fruit pulp of each bunch)

Table 2. β -Carotene content (ug) in *Musa surier* L. and *Musa sapientum* L of each stage

ripening stage	<i>Musa surier</i> L.		<i>Musa sapientum</i> L.	
s1	1582.43	±120.096	348.12	±71.64
s2	2469.38	±257.241	460.33	±61.67
s3	3246.60	±526.04	516.84	±26.66
s4	4148.35	±155.10	611.52	±42.27

s1 = green, s2 = Greenish, s3 = Yellow, and s4 = yellow, flecked with brown

5. Discussion

The β -carotene content was correlated to ripening stages according to TSS which increased along with the ripening stages. Our results showed that the increased TSS according to the changed of banana peel from s1 to s4 was also associated with an increase of β -carotene content in *M. surier* L. On the other hand, β -carotene content in *M. sapientum* L. was hardly increased when compared to *M. surier* L. Therefore, the relationship between banana ripening phase and β -carotene content might depend on banana cultivars. When comparing from stage 4 (yellow with brown fleck) of both types of bananas, it was found that β -carotene content of *M. surier* L.

(4148.35 µg/ 100 g of fresh weight) was more than *M.sapientum* L. (611.52 µg/ 100 g of fresh weight). This might be useful for selecting banana cultivars for further development, such as in nutraceutical formulations or dietary supplements.

6. Acknowledgement

This work was supported by the Center of Excellence for Innovation in Chemistry (PERCH-CIC) and Cosmetics and Natural Products Research Center (COS-NAT). The authors gratefully acknowledge the Faculty of Pharmaceutical Sciences, Naresuan University for providing the necessary facilities.

7. References

- Davey, M. W., Keulemans, J., & Swennen, R. (2006). Methods for the efficient quantification of fruit provitamin A contents. *Journal of Chromatography A*, 1136(2), 176-184.
<https://doi.org/https://doi.org/10.1016/j.chroma.2006.09.077>
- Drapal, M., & Fraser, P. D. (2019). Determination of carotenoids in sweet potato (*Ipomoea batatas* L., Lam) tubers: Implications for accurate provitamin A determination in staple starchy tuber crops. *Phytochemistry*, 167, 112102. <https://doi.org/https://doi.org/10.1016/j.phytochem.2019.112102>
- Grether-Beck, S., Marini, A., Jaenicke, T., Stahl, W., & Krutmann, J. (2017). Molecular evidence that oral supplementation with lycopene or lutein protects human skin against ultraviolet radiation: results from a double-blinded, placebo-controlled, crossover study. *Br J Dermatol*, 176(5), 1231-1240.
<https://doi.org/10.1111/bjd.15080>
- Leerach, N., Yakaew, S., Phimnuan, P., Soimee, W., Nakyai, W., Luangbudnark, W., & Viyoch, J. (2017). Effect of Thai banana (*Musa* AA group) in reducing accumulation of oxidation end products in UVB-irradiated mouse skin. *Journal of Photochemistry and Photobiology B: Biology*, 168, 50-58.
<https://doi.org/https://doi.org/10.1016/j.jphotobiol.2017.01.025>
- Petruck, G., Del Giudice, R., Rigano, M. M., & Monti, D. M. (2018). Antioxidants from Plants Protect against Skin Photoaging. *Oxid Med Cell Longev*, 2018, 1454936. <https://doi.org/10.1155/2018/1454936>
- Rodriguez-Concepcion, M., Avalos, J., Bonet, M. L., Boronat, A., Gomez-Gomez, L., Hornero-Mendez, D., Limon, M. C., Meléndez-Martínez, A. J., Olmedilla-Alonso, B., Palou, A., Ribot, J., Rodrigo, M. J., Zacarias, L., & Zhu, C. (2018). A global perspective on carotenoids: Metabolism, biotechnology, and benefits for nutrition and health. *Prog Lipid Res*, 70, 62-93.
<https://doi.org/10.1016/j.plipres.2018.04.004>
- Shete, V., & Quadro, L. (2013). Mammalian metabolism of β -carotene: gaps in knowledge. *Nutrients*, 5(12), 4849-4868. <https://doi.org/10.3390/nu5124849>
- Tongpoolsomjit, K., Grandmottet, F., Boonruangrod, R., Krueajan, A., & Viyoch, J. (2020). Determination of [beta]-carotene content in *Musa* AA pulp (Kluai Khai) at different ripening stage and harvest period in Thailand [Report]. *Emirates Journal of Food and Agriculture*, 32, 443+.

- Viyoch, J., Mahingsa, K., & Ingkaninan, K. (2012). Effects of Thai Musa species on prevention of UVB-induced skin damage in mice. *Food Chem Toxicol*, 50(12), 4292-4301.
<https://doi.org/10.1016/j.fct.2012.08.060>
- WHO., W. H. O. (2020). *Healthy diet*. Retrieved November 11, 2020 from <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>
- Yabuzaki, J. (2017). *Carotenoids Database: structures, chemical fingerprints and distribution among organisms*. Database, 2017. <https://doi.org/10.1093/database/bax004>

USING INPUT SHAPING ALGORITHM TO THE CONTROL OF ROBOT ARM WITH A SWING PENDULUM

Puttiphong Jaroonsiriphan Ph.D.*

Todsapond Sukyot

Phadungsilp Phitak

Faculty of Engineering and Technology, Pathumthani University

***Corresponding Email: puttiphong.j@ptu.ac.th**

ABSTRACT:

This work focuses on the control of worldwide used robot arm, an Adept Cobra 600 4-axis SCARA robot, through input shaping command. Once the load dynamics and robot inverse kinematics have been calculated, a command shaper is designed and implemented. In particular, command shaping is applied to move a cable suspended load at the end point with the objective of eliminating residual vibration, thus minimizing swing angle of the pendulum. This paper discusses inverse kinematics, pendulum dynamics calculations, the corresponding shaping control algorithm, and the effects of transmission delay to the control output respectively. The significantly improved performances of the robot after the shaping command is applied are presented by resulting in dramatically eliminating the residual oscillations causing swing angle runs to lowest as purposed. Also, the robustness and tolerance to the time delay of the ZV and ZVD shapers are assessed and compared. This paper obviously expresses that the ZVD has more robustness and tolerance than the other since more sequences of impulse shaper are applied.

Keywords: Cobra 600 robot, swing angle, input shaping command, inverse kinematics, ZV and the ZVD shapers, residual vibration.

1. Introduction

This work addresses the design of command shaping for controlling a swing load angle where the designed command sequences are transmitted in different time. Effects of time delay are also assessed in terms of residual oscillation of the load. The less oscillation or minimum swing load angle which presents the efficient and desired performance is discussed. With remarkable idea of self-canceling oscillations, the command shaping algorithm is chosen for controlling so as to lowest residual oscillations in the system responses. Therefore, system performance in terms of minimum swing angle is remedied and significantly improved.

With the broad availability of high-speed lines, bandwidth is becoming less inhibiting provided the control interfaces are appropriately designed. Connection reliability challenges both the network infrastructure as well as robustness of the control design [1]. Time delay remains a significant problem as the web traffic is at

times unpredictable. Controller not designed to handle time delay will introduce significant performance deterioration and even instability into the system [2].

2. Research Objective

(2.1) Apply input shaper algorithm by using ZV and ZVD shaper to robot arm with a swing pendulum so as to minimize and lowest the swing angle. Also, both results will be realistically compared.

(2.2) Numerical calculation of shaper input is applied to the system, thus resulting in system performance significant improvement by expectation of residual oscillation cancellation being purposed.

(2.3) System characteristic represented by robot joint angle is determined.

(2.4) Like the swing angle being minimized, load tip position versus time is finally expressed, which expresses the improvement of system performance.

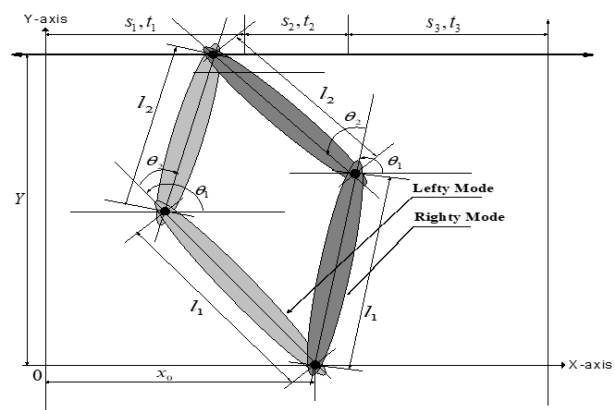
3. Research Methodology

3.1 Hardware Description and Robot Kinematics

The Adept Cobra 600 4-axis SCARA robot is shown in Figure 1(a). The Cobra 600 has a reach of 600 mm in the horizontal (x-y) plane and a reach of 210 mm in the vertical (z) direction with a maximum payload of 5.5 kg. The ranges of motion for the joints are as follows: joint 1: $\pm 105^\circ$, joint 2: $\pm 150^\circ$, joint 3: ± 210 mm, joint 4: $\pm 360^\circ$. Joint 1 is the joint connected directly to the base of the robot. Its motion is in the x-y plane. Joint 2 is the next link out attached to the end of joint 1. Its motion is also in the x-y plane. Joint 3 is located at the end of joint 2 and oriented perpendicular to joint 2. As indicated by the joint range of motion, the motion of joint 3 is purely up and down along the z-axis. Joint 4 is the rotation of the end effector to which a pendulum is attached.



(a)



(b)

Figure 1: (a) Hardware set up showing the Cobra 600 with a swing pendulum.

(b) Model of Adept Cobra 600 robot with pendulum suspended vertical to the x-y plane.

The experimental set up shown in Figure 1(a) can be expressed in the model as shown in Figure 1(b). The load is vertically suspended from the plane at a distance of $l = 0.98$ m so that the natural frequency of the pendulum is about $\sqrt{10}$ rad/s. The equation governing the motion of the pendulum is given by:

$$\ddot{q} + \frac{g}{l} \sin q = \frac{f}{m} \quad (1)$$

where θ, l, g, m , and f are respectively, the swing angle of the pendulum, the cable length of the pendulum, gravitational constant, a mass of the load, and an applied force. To execute a linear motion at the end point of the robot, only two degrees of freedom using joint 1 and joint 2 of the robot, are required.

The robot is powered and operated through the Adept MV-1060 controller. This controller consists of two separate towers, a PA-4 power amplifier chassis and a MV-10 Adept Windows controller chassis. The PA-4 power amplifier runs on 220 volt 3-phase power. The MV-10 controller runs on 110 or 220 volts single phase power. The MV-10 controller has internal memory with V+ programming environment loaded on it as well as free space for storing program codes. A PC is connected to the MV-1060 via a high speed LAN. The PC standardizes the web interface requirements for modular connection to the main server. Refer to Figure 1(b), Table 1 shows the notations are used to describe the characteristics robot:

Table 1: Notations

g	$9.81 \frac{\text{m}}{\text{s}^2}$	Gravity Acceleration.
l	0.98 m	Length of Pendulum.
v	$0.50 \frac{\text{m}}{\text{s}^2}$	Maximum End-effector Speed.
T	$\frac{2\pi}{\sqrt{\frac{g}{l}}} = 1.986\text{s}$	Oscillation Period of Pendulum.
x_0	0.335 m	Initial Position of End-effector.
l_1	0.325 m	Length of Robot Arm Link#1 (Joint 1).
l_2	0.275 m	Length of Robot Arm Link#2 (Joint 2).
X	0.625 m	Total Distance in X-Direction.
Y	0.495 m	Total Distance in Y-Direction.
t_1	$\frac{T}{2} = 0.993\text{s}$	Time for which robot is running with half of max speed after acceleration.
t_2	$\frac{X - \frac{vT}{2}}{v} = 0.257\text{s}$	Time for which robot is running with maximum speed.
t_3	$\frac{T}{2} = 0.993\text{s}$	Time for which robot is running with half of max speed after deceleration.
s_1	$\frac{vT}{4} = 0.248 \text{ m}$	Distance for which robot is running with half speed after acceleration.
s_2	$X - \frac{vT}{2} = 0.129 \text{ m}$	Distance for which robot is running with maximum speed.
s_3	$\frac{vT}{4} = 0.248 \text{ m}$	Distance for which robot is running with half speed after deceleration.

3.2 Command Shaping Algorithm and Design

To clarify the control loop structure, the control for the swing pendulum angle comprises of a local feedback control which regulates the basic joint motions and a control which enhances the performance of the system. In this work, the attention is focused on feedforward control which provided point-to-point direction of the pendulum position. To suppress load swing, the method of input shaping is applied [3], [4] to eliminate or reduce the residual oscillations in the system responses by self-canceling oscillations, thereby improving dramatically the performance. By sending an impulse to the system as an input, the system response will oscillate with its damped natural frequency. Another carefully timed and weighted impulse will generate an out-of-phase oscillation so that total oscillation is cancelled.

A brief mathematical overview of the input shaping scheme [4] [5] is presented. For simplicity, a second order system (2) subject to an m-impulse excitation is considered:

$$G(s) = \frac{\omega_n^2}{s^2 + 2\zeta\omega_n s + \omega_n^2} \quad (2)$$

The unit impulse response of

$$y(t) = \frac{\omega_n}{\sqrt{1-\zeta^2}} e^{-\zeta\omega_n(t-t_0)} \sin\left(\left(\omega_n\sqrt{1-\zeta^2}\right)(t-t_0)\right) u(t-t_0) \quad (3)$$

where t_0 is the impulse time and $u(\square)$ is the unit step function. Let y_i be the response to impulse $A_i\delta(t-t_i)$.

Then the total response is

$$y(t) = \sum_{i=1}^m y_i(t) \quad (4)$$

where

$$y_i(t) = \frac{A_i\omega_n}{\sqrt{1-\zeta^2}} e^{-\zeta\omega_n(t-t_i)} \sin\left(\left(\omega_n\sqrt{1-\zeta^2}\right)(t-t_i)\right) u(t-t_i) \quad (5)$$

Let

$$B_i = \frac{A_i\omega_n}{\sqrt{1-\zeta^2}} \quad (6)$$

and

$$\omega_d = \omega_n\sqrt{1-\zeta^2} \quad (7)$$

The total response at settling time $t = t_N$ can be written as:

$$y(t_N) = \sum_{i=1}^m B_i e^{-\zeta\omega_n t_N} e^{\zeta\omega_n t_i} \sin(\omega_d(t_N - t_i)) \quad (8)$$

Alternatively,

$$y(t_N) = e^{-\zeta\omega_n t_N} \sum_{i=1}^m B_i e^{\zeta\omega_n t_i} [\sin(\omega_d t_N) \cos(\omega_d t_i) - \sin(\omega_d t_i) \cos(\omega_d t_N)] \quad (9)$$

or

$$y(t_N) = e^{-\zeta\omega_n t_N} \left\{ \left[\sum_{i=1}^m B_i e^{\zeta\omega_n t_i} \cos(\omega_d t_i) \right] \sin(\omega_d t_N) - \left[\sum_{i=1}^m B_i e^{\zeta\omega_n t_i} \sin(\omega_d t_i) \right] \cos(\omega_d t_N) \right\} \quad (10)$$

By eliminating the $\sin(\omega_d t_N)$ and $\cos(\omega_d t_N)$ terms, the residual vibration V can, therefore, be expressed as:

$$V(\omega_n, \zeta, t_N) = |y(t_N)| = e^{-\zeta \omega_n t_N} \sqrt{\left[\sum_{i=1}^m B_i e^{\zeta \omega_n t_i} \cos(\omega_d t_i) \right]^2 + \left[\sum_{i=1}^m B_i e^{\zeta \omega_n t_i} \sin(\omega_d t_i) \right]^2}$$

(for $t_N > t_1, t_2, \dots, t_m$) (11)

Now since V also depends upon A_i and $t_i, i = 1, 2, \dots, m$. It is possible to solve for A_i and t_i to zero out the residual vibration.

In the case that $m = 2$, the Zero Vibration (ZV) shaper is derived [4].

$$A_1 = \frac{1}{1+K}, A_2 = 1 - A_1 = \frac{K}{1+K} \quad (12)$$

$$\text{where } K = e^{\frac{-\pi \zeta}{\sqrt{1-\zeta^2}}} \text{ and } \Delta T = \frac{\pi}{\omega_n \sqrt{1-\zeta^2}}$$

For $m = 3$, the ZVD shaper is derived as [4]:

$$A_1 = \frac{1}{(1+2K+K^2)}, A_2 = \frac{2K}{(1+2K+K^2)}, A_3 = \frac{K^2}{(1+2K+K^2)} \quad (13)$$

where $t_1=0, t_2=\Delta T, t_3=2\Delta T$

For an input shaping control sequence, the amplitudes A_i can be transmitted accurately whereas the switch time t_i is subject to propagation delay. It is therefore recommended that the design incorporates the nominal transmission delay time into the switch time and then assess the effects of delay variations using the residual vibration $V(\omega_n, \zeta, t_N)$. For ZV and ZVD, the effects of delay variations on residual vibration are summarized in Figure 2 below:

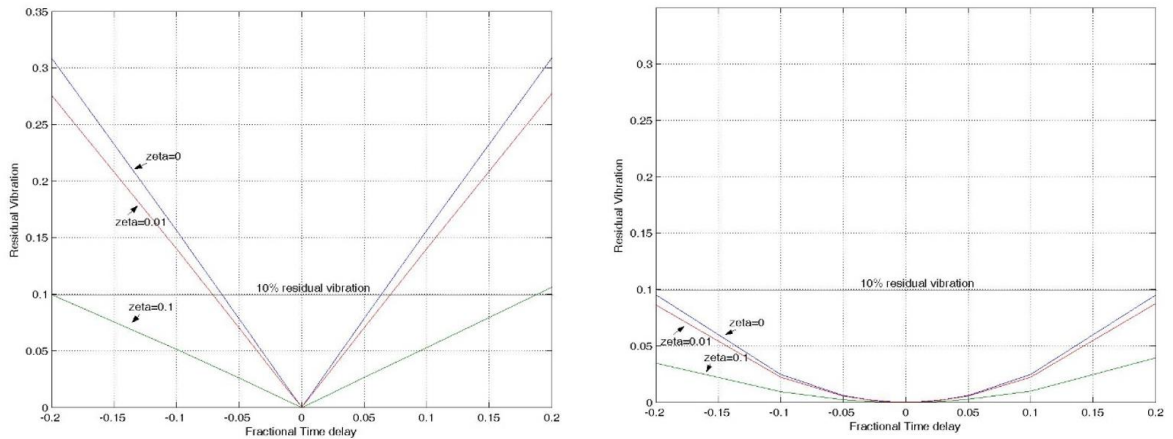


Figure 2: Effects of transmission delay variations on residual vibration for ZV(left) and ZVD(right).

As shown in Figure 2, the ZV design has a higher sensitivity to transmission delay particularly when the system damping is low (ζ “zeta” = 0). For 10% residual vibration, the time delay variation is $\pm 6\%$ about the nominal delay. The ZVD design, on the other hand, is more robust and can tolerate $\pm 20\%$ delay time variations.

This is, however, at the expense of a slower command cycle. Furthermore, in certain cases, the statistical nature of delay time variation may be known and can be modeled with a probability distribution. The pattern of variations can be incorporated into the shaper design to minimize the expected level of residual vibration [5].

Consider swing angle (θ) of the pendulum as the oscillatory response which is to be kept close to zero as the end of joint 2 follows a linear trajectory shown in Figure 1(b). A total of 4 switches are needed to execute a ZV shaper to complete the start and stop operations as shown in Figure 3 where

A_1 = Impulse shaper input caused by the acceleration of the robot to half of maximum speed $\left(\frac{v}{2}\right)$.

A_2 = Impulse shaper input caused by the acceleration of the robot to the maximum speed (v).

A_3 = Impulse shaper input caused by the deceleration of the robot to half of maximum speed $\left(\frac{v}{2}\right)$.

A_4 = Impulse shaper input caused by the deceleration of the robot to zero speed.

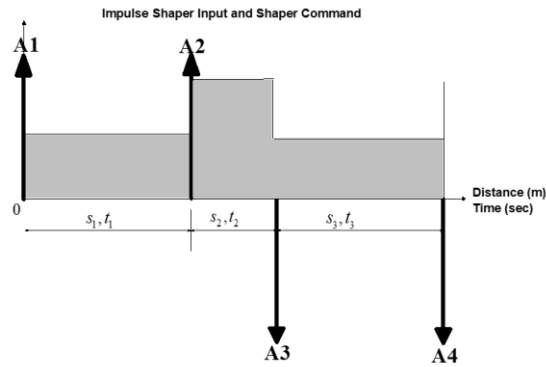


Figure 3: Impulse shaper input applied to the system.

The concept of input shaping applied to the robot experiment is shown in Figure 4.

- Starting at $t=0$, the robot accelerates from speed $0 \rightarrow \frac{v}{2} \left(0.25 \frac{m}{s}\right)$ when impulse shaped command (A_1) is applied to the system. Then the swing angle of the pendulum will oscillate by $\omega = \frac{2\pi}{T} = 3.16 \text{ rad/s}$
- At $t=t_1=0.993s$, the robot accelerates from speed $\frac{v}{2} \rightarrow v \left(0.50 \frac{m}{s}\right)$ when the impulse shaped command (A_2) is applied to the system. Then the swing angle of the pendulum will oscillate by $\omega = \frac{2\pi}{T} = 3.16 \text{ rad/s}$ as well. The oscillations from both the impulse inputs are totally out-of-phase and thereby canceling each other. Therefore, the swing angle of the pendulum equals zero from the time that the second impulse is applied.
- At $t=t_1+t_2=1.25s$, the robot accelerates from speed $v \rightarrow \frac{v}{2}$ during the impulse shaped command (A_3) application. Then the swing angle of the pendulum will oscillate by $\omega = \frac{2\pi}{T} = 3.16 \text{ rad/s}$ in the opposite direction.

- At $t = t_1 + t_2 + t_3 = 2.243\text{s}$, the robot accelerates from speed $\frac{v}{2} \rightarrow 0$. This means that the impulse shaped command (A_4) is applied to the system. Then the swing angle of the pendulum will oscillate by $\omega = \frac{2\pi}{T} = 3.16 \text{ rad/s}$ in the same direction of that of previous step. The oscillation from the both the impulse inputs cancel each other; therefore, the swing angle of the pendulum equals to zero from the time being that the fourth impulse is applied.
- At $t \geq 2.243\text{s}$, the swing angle of the pendulum equals to zero at all time.

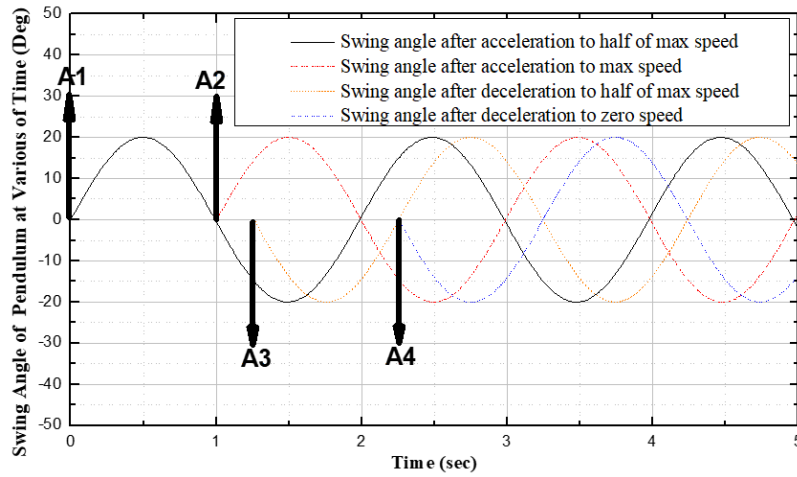


Figure 4: Swing angle (θ) of pendulum at each period of time.

4. Result

Due to cancellation of the oscillation waveform resulting from the input shaped commands, Figure 5 shows that the system response, which is the swing angle of the pendulum, has zero vibration.

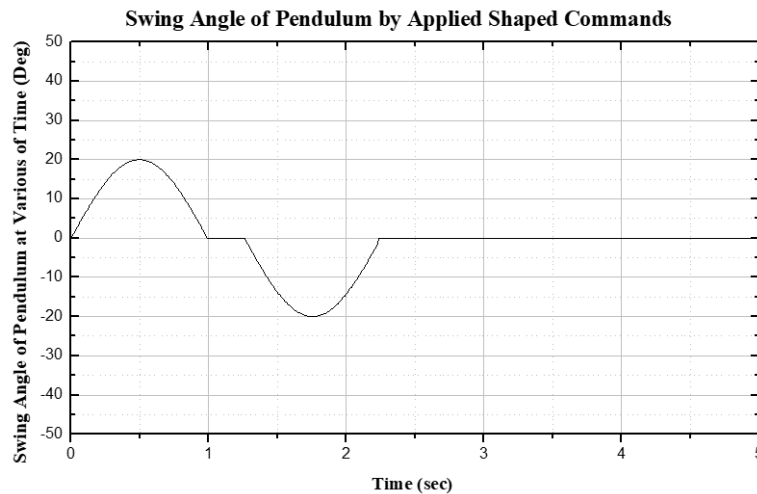


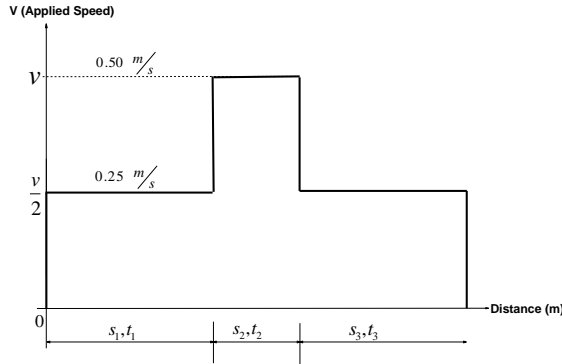
Figure 5: Swing angle (θ) of pendulum under input shaping command.

Assuming zero damping for the pendulum and an oscillation period of the pendulum of $T = 1.986\text{s}$, the ZV shaper velocity and position profile can be readily determined with time durations over the range of the

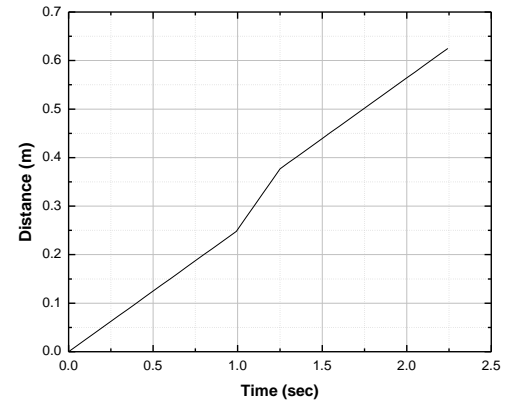
total distance on the X-axis, of $t_1 = \frac{T}{2} = 0.993s$ (duration of time for half of maximum speed after acceleration),

$$t_2 = \frac{X - \frac{vT}{2}}{v} = 0.257s \text{ (duration of time for maximum speed), and } t_3 = \frac{T}{2} = 0.993s \text{ (duration of time for half}$$

speed after deceleration) as shown in Figure 6(a). Figure 6(b) shows distance where the robot linearly moves corresponds to time t .



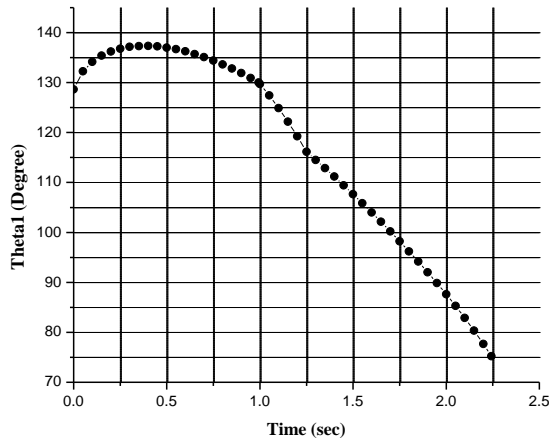
(a)



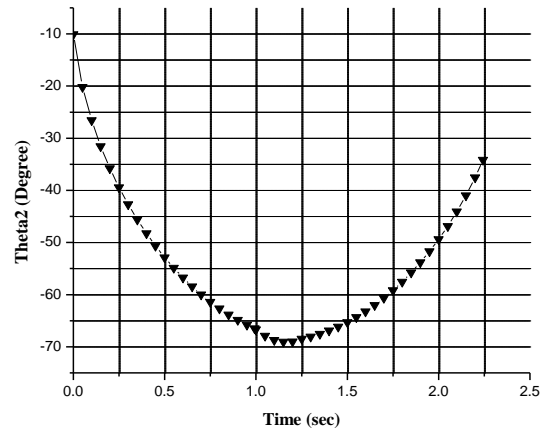
(b)

Figure 6: (a) Robot end point speed. (b) Position profile under command shaping control.

Finally, the relationship between θ_1, θ_2 and time t can be obtained and has shown in Figure 7(a)-(b).



(a)



(b)

Figure 7: (a) Joint angle θ_1 vs t . (b) Joint angle θ_2 vs t .

A graph of an input shaped command for the pendulum shown in Figure 4 is applied to the system, the resulting in the load position in the x-direction, which is measured by a camera and is graphed in Figure 8. It is noted that the experimental trajectory agrees well with the theoretical prediction except for a small amount of residual vibration due to mismatches on the damping coefficients. It should be mentioned that the residual

vibration manifests itself as a 2 dimensional oscillation in the x-y plane. Improve parameter matching or the use of an additional switch in the shaper will alleviate this problem.

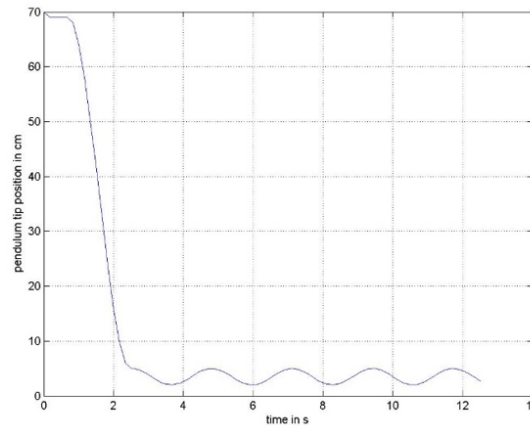


Figure 8: Experimental load position

Finally, comparing the ZV to ZVD design, on the other hand, The ZVD design is more robust, has less sensitivity to transmission delay particularly when the system damping is low (ζ “zeta” = 0), and improves tolerance to delay time variations. Those make the ZVD has higher stability and improve system performance expected to minimize the level of residual vibration [5].

5. Discussion and suggestion

The most important factor for controlling whatever system is system stability, robustness, and reliable. In fact, there are varieties of methods to improve systems such as PID controller, feedback, feed forward, observer etc. The input shaper is one of the most efficient and powerful algorithms applied for enhancing system performance and increasing system robustness. This paper has applied input shaper algorithm to robot experiment. As seen from Figure 3 and 4, such algorithm is processed by system mathematic model and numerical calculation to receive the shaped input shown in Figure 6. Consequently, the experiment result indicates that the system performance significantly improves. The vibration on the swing angle is reduced to almost zero, thus producing in dramatically robustness as shown in Figure 5 and 8. Also it obviously expresses that the ZVD has more robustness and tolerance than ZV because a number of impulses is greater as shown in Figure 2. Finally, the angles of joint θ_1 and θ_2 vs t is shown in Figure 7 expressed in uniform figure, which corresponds to pendulum tip position.

This shaper algorithm absolutely can be applied to the realistic project such as crane project or the one related to uniformly oscillating movement. This can eliminate all vibration down to zero. The choice of ZV or ZVD depending upon application and other concerns. In the future, the vibration control can be possessed by the input shaping algorithm implicitly.

Acknowledgement: The authors wish to express their gratitude to Adept Technologies, Inc. for the donation of an Adept Cobra 600 robot and technical support. Also the authors would like to thank both Faculty of Engineering and Technology, Pathumthani University and all colleagues cooperating for this research data support to make this research possibility and reality.

6. References:

- [1] Veillette, R.J, Medanic, J.V., and Perkins, W.R., (1992). "Design of Reliable Control Systems," *IEEE Transactions on Automatic Control*, 37, pp. 290-304.
- [2] Chang, T.N. and Davison, E.J. (2001). "The Decentralized Robust Stabilization and Regulation Problem Subject to Gain and Phase Perturbation," *Proceedings of the American Control Conference*, 5, pp. 4052-4057.
- [3] Singhose, W., Porter, L., Kenison, M., and Krikkku, E., "Effect of Hoisting on the Input Shaping Control of Gantry Cranes," *Control Engineering Practice*, 8, 1159-1165.
- [4] Singer, N., and Seering, W. (1990). "Preshaping Command Inputs to Reduce System Vibration," *ASME J. Dynamic Systems, Measurement, and Control*, 112(1), pp. 76-82.
- [5] Chang, T.N., Hou, E. and Godbole, K. (2003). "Optimal Input Shaper Design for High Speed Robotic Workcells," *Journal of Vibration and Control*, 9(12), pp.1359-1376.
- [6] Wenping Jiang, and Weimin Ge. (2008). "Modeling and H-Robust Control for Mobile Robot ", In *2008 IEEE Conference on Robotics, Automation and Mechatronics*, pp.1108-1112.
- [7] Sara Sadr, S. Ali A. Moosavian, Payam Zarafshan, "Damping control of a quadrotor with swinging load using input shaping method", 2014 Second RSI/ISM International Conference on Robotics and Mechatronics (ICRoM)