



SUCCESS OF USING THAI MOOCs IN THAILAND OPEN LEARNING SERVICES

Mark Erik Nele Kolenberg¹, Chetneti Srisa-An²

^{1,2} College of Digital Innovation Technology, Rangsit University, Pathum Thani, Thailand.

Abstract: Post-covid-19 pandemic changes have occurred everywhere. In education, to cope with the global changes, educators have moved from traditional face-to-face classrooms to new alternative distance learning methods. Thai government has adjusted to global changes for education in their 20-year national plan to use Thai MOOCs open learning service, the Thai version of massive open online courses, as the new alternative learning method, as it is easier to access, open, repetitive, affordable, and useful. This study utilized an online questionnaire to measure the qualitative consensus of 25 experts using the Rough Set Delphi technique to explore the interrelationship among components and quantitative confirmative factor analysis of 800 Thai MOOC users. The results revealed that factors – such as knowledge sharing, Thai MOOC features, motivation-usage, perceived usefulness, perceived ease of use, attitude toward using, and actual use – affected the success of Thai MOOC usage.

Keywords: Knowledge Sharing, Motivation and Usage, Attitude toward Use, Actual Use

1. INTRODUCTION

The modern society we live in has seen many changes. One of the recent changes happened in 2019 due to the Covid-19 virus. The worldwide affect changed the way organizations, nations, and people worldwide live. These changes are seen today, as people are taking more precautions than before. A new preference of working and living method that is more safety conscious is that people do not have to contact each other (Beer, 2019; De Vos, 2022; Neuschafer, 2023).

Education, like every other organization, has to adjust to the new normal, leading to a new preference in education to lean toward distance learning, where classes can be conducted online by users of different open learning service courses. One of the courses that first appeared in 2008, before the pandemic, is known as MOOCs, or mass open online courses, were initial courses are freely accessible or some courses with a payment fee. Harvard University and MIT were the first educational institutions to use MOOCs. Since their inception, MOOCs have expanded dramatically, due to the fact that MOOCs are relevant to users' interests (Kurniawan et al., 2021).

In the case of Thailand, the idea of MOOCs as the base was adopted, and since 2016, the Thai version of MOOCs, also known as Thai MOOCs or Thai Massive Open Online Courses, have been created. As an open learning service, Thai MOOCs are created according to Thailand 20-year plan to increase the skills of Thai people to be more relevant to global market demands. Thailand's national strategy for building competitiveness utilized Thai MOOCs to teach new skills to learners and provide knowledge courses that are increasing Thai competitiveness on the global market. The government launched the official Thai MOOC website, known as www.ThaiMOOC.org, where classrooms can be booked to follow for different fields with interests ranging from traditional courses such as language learning, including Mandarin Chinese and English, to modern interest courses such as digital marketing or modern branding of products. All courses provided by Thai MOOCs are reflected as part of the national strategy for human resources development and national strategy to opportunity creation by providing access to opportunities to learn for people of all ages and backgrounds (Thailand Cyber University, 2018).

Thai MOOCs has encountered a few problems with Thai MOOCs. First, not many people, only 614,892 users in the Kingdom of Thailand compared to the 71.7 million people living in Thailand, are aware of Thai MOOCs, and their usefulness, as seen by the actual usage in 2022. Second, another problem is that even if they are university professors and lecturers providing courses, many of the courses are not known, even within the area where the



professor and lecturers reside (Gamage et al., 2020). Third, the need to have internet access at the time of the open learning service online courses is mandatory. However, some learners do not have access to the internet (Legg-Jack & Ndebele, 2023). Fourth, the shift from face-to-face traditional classroom learning to course delivery online, lacking physical interaction with peers, could affect learners' self-motivation and engagement (Kong, 2023). These are a few examples of problems impacting the success of using Thai MOOCs open learning services. (Thailand massive open online courses, 2023).

From the reasons mentioned above, it is obvious that mass open online courses, or MOOCs open learning service, gain significant importance in the post-covid-19 pandemic situation as education looks for alternative distance learning methods instead of traditional classroom learning (Bozkurt & Keefer, 2018). The Thai 20-year national plan sees the importance of technology advancement using AI (artificial learning), Chat GPT, and MOOCs impact on learning reforms for all ages and backgrounds to access free courses or knowledge and information, so they came up with the Thai version of MOOC or Thai MOOCs. Thai MOOCs educational goal is to provide different courses in diverse fields that reflect the interest and necessary knowledge courses for the current global market situation as a new key for modern way of teaching (Swartzwelder et al., 2023). This is supported by many universities in Thailand, as their lecturers provide courses in Thai MOOCs. However, according to 2022, of the 71.7 million people in Thailand, only 614,892 use Thai MOOCs. Does that mean that it is not successful? It was only founded in 2016 and has already seen rapid growth every year (Thailand Massive Open Online Course, 2023). Evidence of the problem prompted the researcher to investigate this topic further because the few problems mentioned may not be all the problems that could affect the Thai MOOCs open learning service success, there may be other components that the researcher wants to find out.

The research question will focus on what are the key antecedents that directly and indirectly contribute to the overall success of using the Thai MOOC education system. So, the objective was to find components affecting the Thai MOOCs success in open learning in Thailand.

2. LITERATURE REVIEW

The review of literature related to the success of using Thai MOOCs in Thailand open learning services from different research and academic works found that seven key components consisting of knowledge sharing, Thai MOOC features, motivation and usage, perceived usefulness, perceived ease of use, attitude toward using, and actual use impact the topic.

Knowledge Sharing (KS)

Salloum et al. (2020) suggest that knowledge sharing refers to the found and openness in sharing of information that is useful and easily accessible to other users of the Thai MOOC education system. By chatting and discussing, people collaborate, learn, and build a stronger understanding of their knowledge. As people with common interests can chat and discuss their know-how, they can share both positive and negative experiences, which can be very useful. Knowledge sharing content creation through the use of the Thai MOOC open learning service helps open topics of discussion that are relevant to the group interest without limiting the issues to what is learned commonly in the classroom only, but to involve current trends by using digital platforms as part of learning.

Thai MOOC Features (TMF)

Kurniawan et al. (2021) studies described Thai MOOC features; in particular, openness and reputation, as having influence on the actual use of Thai MOOC open service. Openness related to Thai MOOC features includes changing topics to meet interests. Reputation related to Thai MOOC features the program's outstanding status. Thai MOOC features are very important as openness and the positive reputation directly and indirectly influences the willingness to use it.

Motivation and Usage (MU)

Salloum et al. (2019) explained that motivation and usage refer to the positive ability for users to adopt and accept the Thai MOOC open learning service, as they need to feel motivated to use the system first. The motivation to use the system comes when the system seems helpful. An open learning service system such as the Thai MOOC open learning service does provide access useful for the user. This creates positive psychological needs and self-motivates users' attributes towards actual users to be positive, leading to continued intention to use and influence other users to use Thai MOOCs successfully.

Perceived Usefulness (PU)

Kalinic et al. (2019) stated that consumers using Thai MOOCs find the open learning service useful towards finding the things they want to know. Perceived usefulness positively impacts consumer behavior intention to use and continue usage of the Thai MOOC open learning service, as the usefulness of the system creates a positive attitude and satisfy the desire of the consumer behavior intention.

Perceive Ease of Use (PEOU)

Kao et al. (2018) explained that users perceive the Thai MOOC open learning service to be easy. This optimistic mindset towards the use of the web portal Thai MOOC open learning service is why consumers continue using the system. The ease of use help access the learning service system Thai MOOC outside of classroom area, at any time the users desires.

Attitude toward Using (ATU)

Kitcharoen et al. (2021) described that attitude as the positive or negative way that an individual perceives confidence towards the Thai MOOC open learning service or any other certain objective-related. The opinion of approval or disapproval is a social interaction that impacts the attitude towards the actual success of using the Thai MOOC open learning service.

Actual Use (AU)

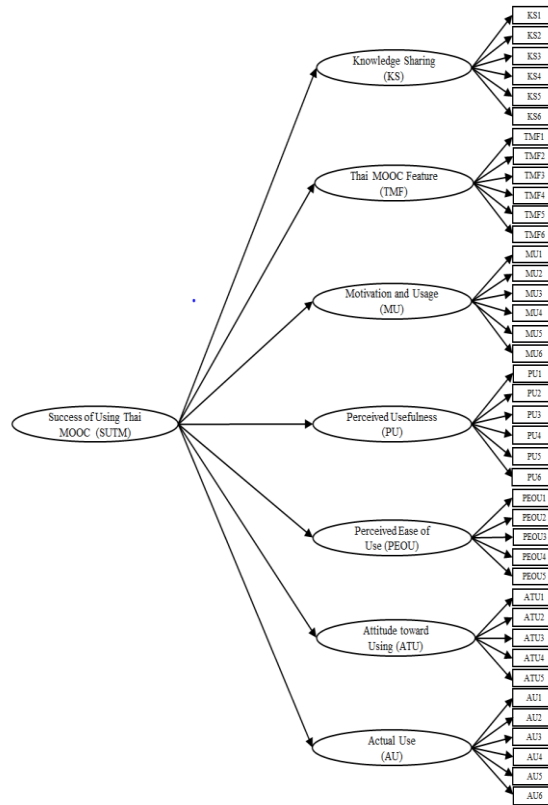
Karjaluoto et al. (2020) identified actual use as the acceptance of technology as part of the learning process, such as the acceptance and daily usage of Thai MOOCs as part of the modern post Covid-19 pandemic new learning process. The actual use is the ability to utilize Thai MOOCs by creating a positive attitude, leading to the actual usage. Provide the necessary information that supports the importance of the Thai MOOC open learning service as part of the new ways of teaching and learning (Sumaedi et al., 2020).

3. CONCEPTUAL FRAMEWORK

The Success of Using Thai MOOC (SUTM) can be seen within the conceptual framework model that integrates technological, motivational, and behavioral constructs to understand how learners perceive and engage with the Thai MOOC education system, as displayed within Figure 1.

Figure 1.

Conceptual Framework

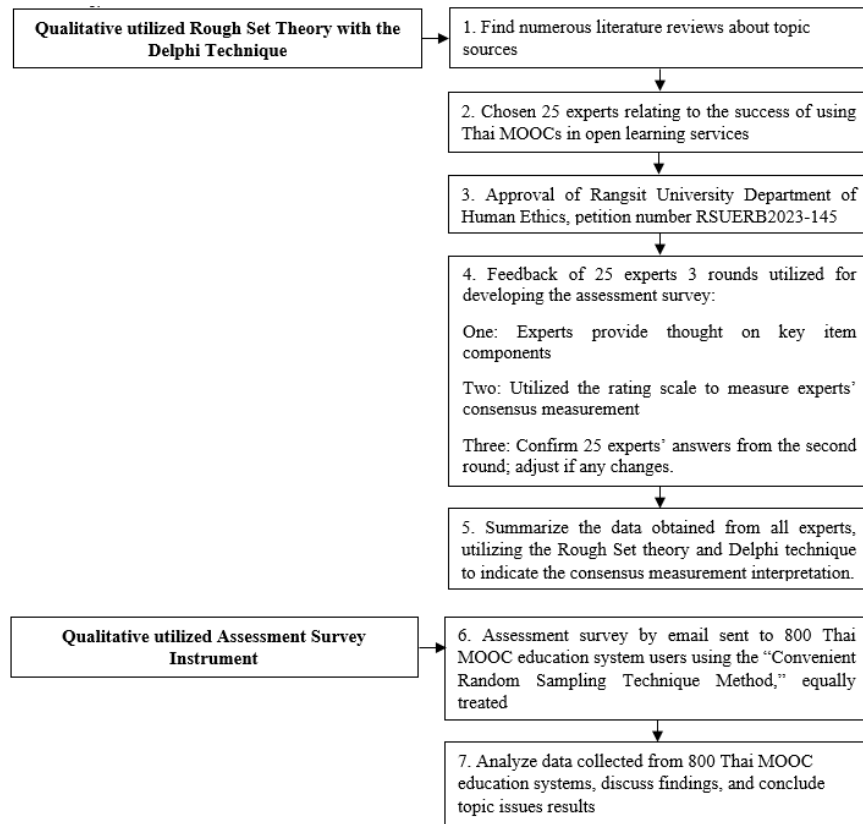


Knowledge Sharing (KS), Thai MOOC Features (TMF), and Motivation and Usage (MU) serve as key antecedents that directly contribute to the overall success of using the Thai MOOC education system. In addition, the model draws from technology acceptance principles, proposing that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) mediate users' evaluation of the platform. These two perceptual beliefs influence the learners' Attitude toward Using (ATU) the MOOC, which subsequently affects their Actual Use (AU) of the open learning service.

4. METHODOLOGY

A mixed-methods approach is utilized to measure the success using Thai MOOCs in Thailand open learning services.

Figure 2.
Methodology



5. QUALITATIVE RESEARCH USING THE ROUGH SET THEORY AND DELPHI TECHNIQUE

Rough Set theory and Delphi technique were employed in 3 rounds as follows (Chairaksa & Pankham, 2023):

Round 1: Open-ended questionnaires were determined based on the guidelines from document review. Then, the open-ended questionnaires were sent via email to 25 experts. The experts reviewed all the questions and provided feedbacks. The feedbacks and recommendations given by 25 experts were then used to synthesize data.

Round 2: Closed-ended questionnaires were distributed via email to 25 experts who reviewed the open-ended questionnaires. The experts assessed the variables, using a 7-point scale. Consensus measurement was conducted for each question.

Round 3: The result of consensus measurement was reconfirmed by 25 experts. If any of the experts propose some adjustment to the close-ended questionnaire, those adjustments are to be made in this round accordingly.

Samples

The samples included 25 participants who were experts with experience in Thai MOOCs or open learning services. The samples were divided into 3 groups: 1) 3 Thai MOOC officials, 2) 11 university professors with experience in open learning services, and 3) 11 teachers who teach and operate within open learning services.

Demographic detail of each expert group area of expertise

Group 1: Thai MOOC officials. The 3 experts in this group will use the selection criteria with not less than 2 years' Thai MOOC policy planning, promotion, supervision, and related to the actual use of open learning service Thai MOOC. This group consists of the different groups of Thai MOOC officials.

Group 2: university professors related to the field of actual use of the open learning service Thai MOOC. The 11 experts in this group will use the selection criteria with not less than 2 years of experience in teaching, work publication, or other related academic activities related to the actual use of the open learning service Thai

MOOC. The university professors process the knowledge and skills required to understand the actual usage of Thai MOOC learning services.

Group 3: teachers who teach and operate within the open learning service Thai MOOC are teachers who do not teach at university but at Thai MOOC learning services. The 11 experts in this group will use the selection criteria with not less than 2 years' experience teaching or operating related to the actual use of the open learning service Thai MOOC. This group processes the understanding of the actual usage of Thai MOOC learning services.

Investigation Tool

The investigation tool was an online questionnaire sent via email for 3 rounds to 25 experts. In round 1, the emails sent covered all related topics. Extracted data from the experts' feedback were used to develop a closed survey assessment instrument. In round 2, the instrument created in round 1 was used to evaluate the variables and suitability of the questions using the 7-level rating scale measured by the experts. Then, in round 3, the experts confirmed the answers that were given in round 2 if any adjustments were requested. The results are presented in Table 2.

Information Gathering

The information gathering process involved three rounds from the 25 experts after receiving the COA, petition number RSUERB2023-145, approval from the Department of Human Ethics, Rangsit University. Information gathering was conducted for three rounds within six months, from November 2023 to April 2024. The findings are shown in Table 1.

Information Interpretation

Information interpretation employed the information gathered from round 2 to measure the five stages of the procedure explained underneath. In round 2, the gathered information for each answer utilized the Rough Set theory and Delphi technique, providing criteria for measuring 25 expert consensuses needed to pass the quality coefficient equal to or greater than 0.75 criteria of measurement.

6. QUANTITATIVE UTILIZED ASSESSMENT SURVEY INSTRUMENT

Population

The population of Thai MOOC users was a total of 614,892 in 2022 (Thailand Massive Open Online Course, 2023).

Sample Size

The sample size of the Thai MOOC users was a total of 800. The sample size was determined by the convenience random sampling method. Following Wiratchai (1999) suggested that the optimal sample size should be within 1 observed variable per 10-20 times or the least acceptable sample size from the Hoelter (1983) statistic that must be greater than 200 to be considered as a harmonious causal relationship model with empirical data. In this study, the number of variables observed required a sample of at least 450 people, and to prevent discrepancy in the data, the researcher increased the sample size to 800.

Research Tool

The research tool utilized for data collection in this research was a questionnaire approved by 25 experts for three rounds. Feedback and recommendations provided by the experts were utilized to the design of the questionnaire.

Data Collection

Data were collected using an online 7-rating scale questionnaire distributed to different Thai MOOC pages, sites, and users. The research mainly investigated factors affecting the success of using Thai MOOCs and open learning services. In addition, relevant variables were measured.

The online questionnaire contained three parts. Part 1 contained a screening question: "Are you a Thai MOOC education system user?" If 'yes', continue to Part 2, if 'no', survey ends. Part 2 was aimed to collect demographic data: age, gender, education level, and the frequency of using Thai MOOCs per year. Part 3 contained 7- rating scale questions aimed to collect data about variables affecting the success of using Thai MOOCs.

The collection of data was conducted for a total period of 3 months, from April to June 2024. Then, 800 users of Thai MOOCs or open learning services were requested to answer the questionnaires. After checking the validity of the data or the null response, a total of 600 completed online assessment questionnaires were qualified to be used for data analysis.

Data Analysis

The first and the second order confirmative factor analysis (CFA) utilized different statistics. Statistical values utilized in Tables 1, 2, and 3 were employed to measure the first-order viability, second-order results, and the success of using Thai MOOCs in Thailand open learning services.

FINDINGS

Findings from Rough Set Theory and Delphi Technique Consensus Measurement

By utilizing the Delphi technique and the Rough Set Theory, the consensus measurement of the questionnaire was conducted. The closed-ended questionnaire comprised 7- rating scale questions. Rough Set Theory and the Delphi technique ($QL \geq 0.75$) achieving the experts' consensus in round 2 is shown in Table 1.

Table 1.

Rough Set Theory and Delphi Technique Consensus Measurement

Success of Using Thai MOOCs in Thailand Open Learning Services Utilizing Rough Set Theory and Delphi Technique	Rough Set Theory and Delphi Technique Consensus Measurement
	$QL \geq 0.75$
Knowledge Sharing (KS)	
KS1: Learning on the Thai MOOC open system helps develop your learning skills quickly.	0.880
KS2: Learning on the Thai MOOC open system allows you to exchange your knowledge easily.	1.000
KS3: Learning on the Thai MOOC open system can build relationships with new groups of people.	1.000
KS4: Learning on the Thai MOOC open system always has up-to-date content.	0.880
KS5: Learning on the Thai MOOC open system helps promote increased creativity.	0.920
KS6: Learning on the Thai MOOC open system promotes peer support.	0.920
Thai MOOC Feature (TMF)	
TMF1: Trust in the quality of learning content on the Thai MOOC open system that it has standards.	0.960
TMF2: Trust the reputation of the teaching team or educational institution in the Thai MOOC open system.	0.880
TMF3: Learning on the Thai MOOC open system creates more learning options.	0.960

TMF4: Learning on the open Thai MOOC system is freely accessible to everyone.	0.960
TMF5: Learning on the Thai MOOC open system is a sharing of educational resources.	0.960

Table 1.

Rough Set Theory and Delphi Technique Consensus Measurement

Success of Using Thai MOOCs in Thailand Open Learning Services Utilizing Rough Set Theory and Delphi Technique	Rough Set Theory and Delphi Technique Consensus Measurement
	QL $\geq$ 0.75
Thai MOOC Feature (TMF)	
TMF6: Learning on the Thai MOOC open system increases opportunities for career advancement.	1.000
Motivation and Usage (MU)	
MU1: Have fun learning on the open Thai MOOC system.	1.000
MU2: Be confident in the knowledge gained from learning on the Thai MOOC open system.	0.960
MU3: Learning on the Thai MOOC open system helps stimulate your interest in learning.	0.960
MU4: Learning on the Thai MOOC open system responds to your needs.	0.960
MU5: Learning on the Thai MOOC open system helps support work to be more efficient.	1.000
MU6: Learning on the Thai MOOC open system helps access to a wide variety of knowledge.	0.960
Perceived Usefulness (PU)	
PU1: Learning on an open system, Thai MOOC has a variety of courses to choose from.	0.960
PU2: Learning on the Thai MOOC open system helps you understand and learn better.	0.960
PU3: The learning process on the Thai MOOC open system is quick to learn	0.880
PU4: Learning on the Thai MOOC open system allows you to learn anywhere, anytime.	0.960
PU5: Learning on the Thai MOOC open system is convenient and saves travel time.	1.000
PU6: Learning on the Thai MOOC open system can help you come back to study again and again.	1.000

Perceived Ease of Use (PEOU)	
PEOU1: Learning on the Thai MOOC open system has a simple and hassle-free process of use.	0.960
PEOU2: Learning on the Thai MOOC open system has courses categorized for easy searching.	0.920
PEOU3: Learning how to use the open Thai MOOC system doesn't take much effort.	0.920

Table 1.

Rough Set Theory and Delphi Technique Consensus Measurement

Success of Using Thai MOOCs in Thailand Open Learning Services Utilizing Rough Set Theory and Delphi Technique	Rough Set Theory and Delphi Technique Consensus Measurement
	QL $\geq$ 0.75
Perceived Ease of Use (PEOU)	
PEOU4: Learning on an open system, Thai MOOC has a notification system that makes it easy to receive course information.	0.960
PEOU5: Learning on the Thai MOOC open system supports use on a variety of devices (such as Smartphones, Tablets, PCs, etc.), making it easier to access the course.	1.000
Attitude toward Using (ATU)	
ATU1: Satisfaction with learning on the open system Thai MOOC	0.920
ATU2: Proud to learn on the Thai MOOC open system.	0.880
ATU3: Love the open learning environment Thai MOOC.	0.920
ATU4: Satisfied with learning on the Thai MOOC open system more than learning in the classroom.	0.840
ATU5: Learning on the Thai MOOC open system will benefit your work.	0.960
Actual Use (AU)	
AU1: Learn on the Thai MOOC open system on a regular basis.	0.800
AU2: Continue to learn on the Thai MOOC open system in the future.	0.880
AU3: Always choose to study additional courses on the Thai MOOC open system.	0.880
AU4: Plan to learn on the Thai MOOC open system in the next 1 month.	0.800
AU5: There is an opportunity for you to recommend others to learn on the Thai MOOC open system.	0.840

AU6: You choose to learn on the Thai MOOC open system because it is lifelong learning.	0.840
--	-------

Findings from First order CFA

Figure 3.
First Order CFA

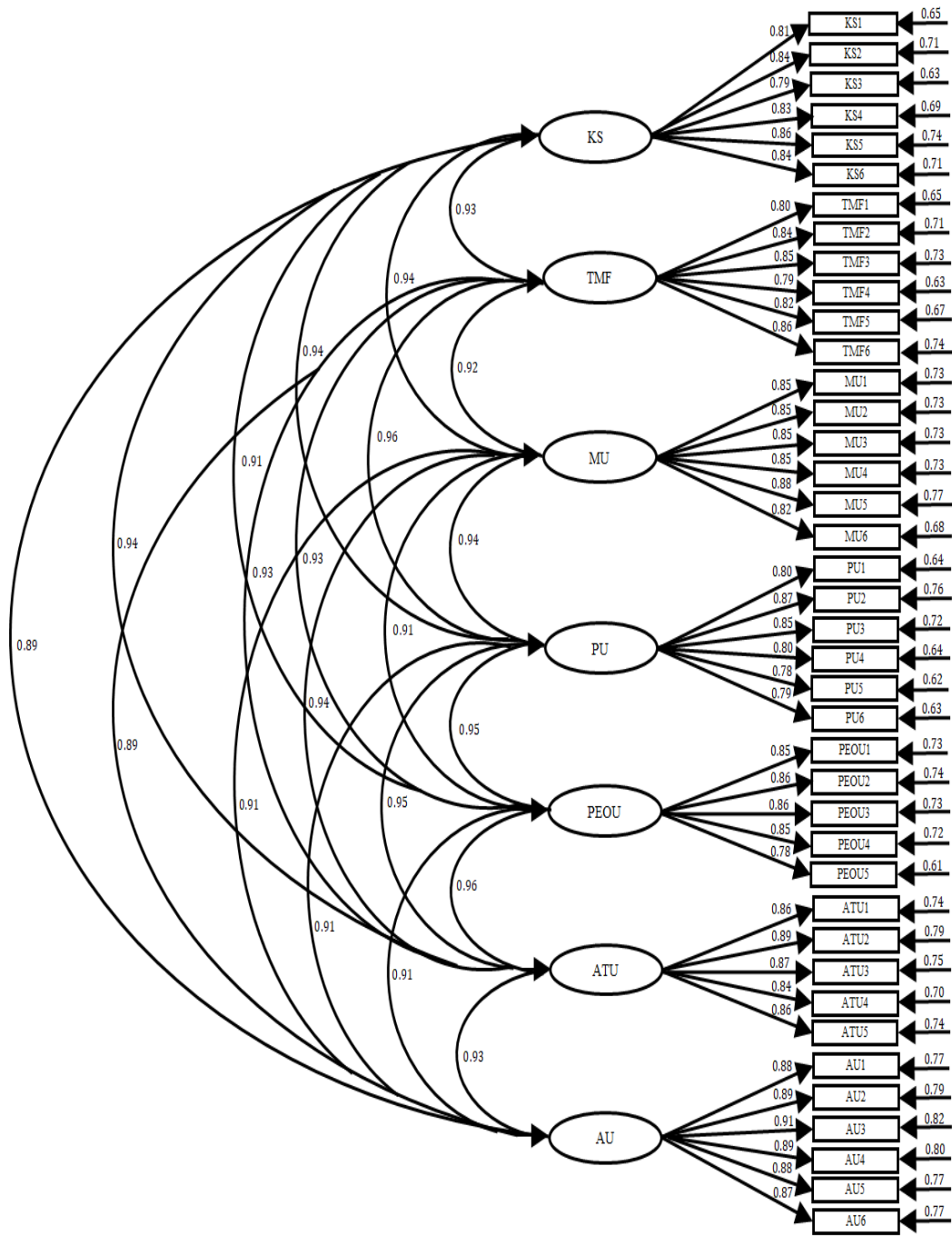


Table 2.
First Order CFA Viability

Statistical Values Utilized	Criteria for consideration	Statistics obtained	Viability
χ^2	-	1032.309	Competent
df	-	637	Competent
χ^2 / df	≤ 2.00	1.621	Competent
GFI	≥ 0.90	0.922	Competent
AGFI	≥ 0.90	0.900	Competent
TLI	≥ 0.90	0.982	Competent
CFI	≥ 0.90	0.985	Competent
SRMR	≤ 0.08	0.032	Competent
RMSEA	≤ 0.08	0.027	Competent
HOELTER	> 200	420	Competent

First Order CFA Viability

The findings from the success of using Thai MOOCs in Thailand open learning services of the first order confirmative factor analysis (CFA) employing different statistical value criteria for consideration are shown in Table 2 (Chairaksa & Pankham, 2023).

Findings from Second Order CFA

Figure 4, Table 3, and Table 4 describe the findings and the measurement validity of the second order confirmative factor analysis (CFA). All components of the second-order CFA findings are validated as competent and valid (Deng et al., 2020).

Figure 4.

Second Order CFA

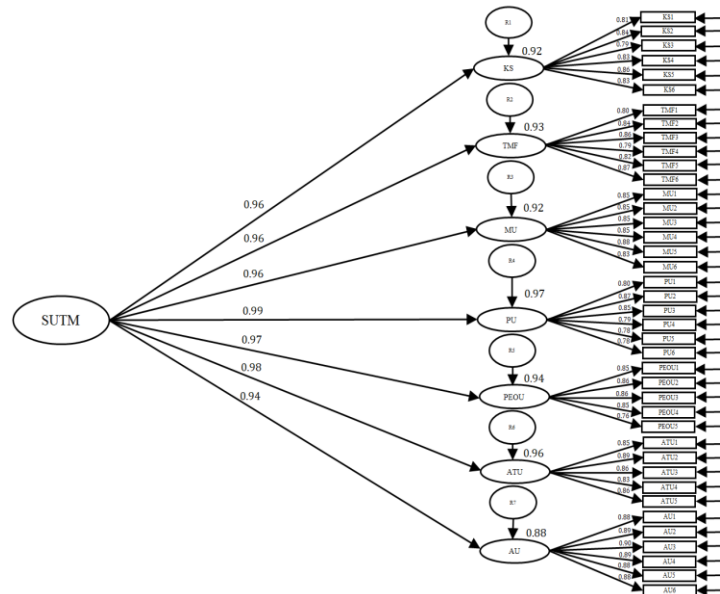


Table 3.

Second Order CFA Result

Variable	Variable Measure			R ²
	b	SE	t	
Knowledge Sharing (KS)	0.960	-	-	0.920
KS1	0.810	-	-	0.655
KS2	0.840	0.040	26.731***	0.708
KS3	0.790	0.050	22.231***	0.618
KS4	0.830	0.042	24.019***	0.690
KS5	0.860	0.044	25.436***	0.746
KS6	0.830	0.046	24.126***	0.695
Thai MOOC Feature (TMF)	0.960	0.048	21.234***	0.930
TMF1	0.800	-	-	0.638
TMF2	0.840	0.043	24.205***	0.710
TMF3	0.860	0.044	24.739***	0.735
TMF4	0.790	0.044	22.067***	0.624
TMF5	0.820	0.044	23.193***	0.667
TMF6	0.870	0.045	24.985***	0.749
Motivation and Usage (MU)	0.960	0.052	22.963***	0.920
MU1	0.850	-	-	0.727
MU2	0.850	0.034	27.532***	0.726
MU3	0.850	0.035	27.277***	0.717
MU4	0.850	0.035	27.465***	0.724
MU5	0.880	0.330	29.044***	0.772
MU6	0.830	0.330	26.070***	0.683
Perceived Usefulness (PU)	0.990	0.047	21.621***	0.970
PU1	0.800	-	-	0.634
PU2	0.870	0.045	25.418***	0.763

PU3	0.850	0.042	24.427***	0.719
-----	-------	-------	-----------	-------

*** p-Value < 0.01

Table 3.
Second Order CFA Result

Variable	Variable Measure			R ²
	b	SE	t	
PU4	0.790	0.041	22.234***	0.627
PU5	0.780	0.043	21.167***	0.583
PU6	0.780	0.044	21.859***	0.613
Perceived Ease of Use (PEOU)	0.970	0.048	23.104***	0.940
PEOU1	0.850	-	-	0.725
PEOU2	0.860	0.035	27.743***	0.736
PEOU3	0.860	0.037	27.843***	0.740
PEOU4	0.850	0.038	27.186***	0.719
PEOU5	0.760	0.036	22.715***	0.580
Attitude toward Using (ATU)	0.980	0.048	23.436***	0.960
ATU1	0.850	-	-	0.728
ATU2	0.890	0.035	30.049***	0.794
ATU3	0.860	0.037	28.229***	0.744
ATU4	0.830	0.035	28.237***	0.693
ATU5	0.860	0.037	28.290***	0.747
Actual Use (AU)	0.940	0.056	23.233***	0.880
AU1	0.890	-	-	0.768
AU2	0.900	0.029	32.029***	0.791
AU3	0.890	0.030	32.992***	0.818

AU4	0.880	0.032	32.214***	0.798
AU5	0.880	0.032	28.859***	0.770
AU6	0.880	0.030	30.592***	0.766

*** p-Value < 0.01

Table 4.
Second Order CFA Measured

Indicator	Standard	Achieve	Assessment
χ^2	-	1008.846	Validate
df	-	637	Validate
χ^2 / df	≤ 2.00	1.584	Validate
GFI	≥ 0.90	0.922	Validate
AGFI	≥ 0.90	0.900	Validate
TLI	≥ 0.90	0.983	Validate
CFI	≥ 0.90	0.986	Validate
SRMR	≤ 0.08	0.027	Validate
RMSEA	≤ 0.08	0.031	Validate

7. DISCUSSION

There are seven variables taken into account as part of the research investigation consistent with the empirical data: knowledge sharing, Thai MOOC features, motivation and usage, perceived usefulness, perceived ease of use, attitude toward use, and actual use. Assessments of CFA viability were measured as being competent and validated for all variables investigated in this study (Alias et al., 2015).

Perceived usefulness had the highest significant weight, as the easy access, openness, repetitiveness, satisfaction of the needs of learners, and affordability of the Thai MOOC open learning service reflected positive impact Thai MOOC users had towards the system (Singh & Mørch, 2024). Perceived usefulness component was the most significant, towards the success of using Thai MOOCs in the Thailand open learning services as the positive attitude towards the system led to actual use because perceived the system as being useful was a key factor for using it (Kalinic et al., 2019; Martin et al., 2020; Nassr et al., 2023).

Attitude toward use had the second significant weight as the positive way individuals perceived the ease of use and usefulness of Thai MOOC open learning service reflected the positive opinion toward the system (Sindiani et al., 2020). Attitude toward the use component was highly significant because user approval of Thai MOOCs comes from the social interaction within the system being positive, which highly impacts the success of using Thai MOOCs in the Thailand open learning services (Kitcharoen et al., 2021).

Perceived ease of use had the third significant weight as the perception that the easy usage of the Thai MOOC open learning service is important toward the actual willingness to implement the Thai MOOCs open learning service (Martin & Bolliger, 2018). Perceived ease of use had a high level of significance, as the positive attitude towards usage of the Thai MOOCs in open learning services was a key factor toward the continued usage of the system and the success of the Thai MOOCs open learning service (Kao et al., 2018; Wang et al., 2023).

Thai MOOC features had the fourth significant weight as the openness and reputation of Thai MOOC features directly impact actual usage of the open learning service. Thai MOOC features had a high level of significance, in

particular, as openness and reputation were key factors influencing the success of Thai MOOCs open learning service (Kurniawan et al., 2021).

Motivation and usage had the fifth significant weight. It is clear that users need to feel motivated to use it first. Motivation to use Thai MOOCs open learning service comes from perceiving the system as easily accessible and useful (Aldowah et al., 2020). Motivation and usage had a high level of significance due to the positive psychological motivation of Thai MOOCs open learning service. Its simplicity, accessibility, and usefulness are key factors toward actual usage of the education system, which impacted Thai MOOCs 7 rating scales success (Badali et al., 2022).

Knowledge sharing had the sixth significant weight, as sharing of information that was open, easily accessible, and useful influenced learners' desire to use Thai MOOCs open learning service. Knowledge sharing had a high level of significance because sharing knowledge of relevant topics to learners' interests created positive chat and discussion leading to a better learning environment and understanding of the topic (Singh & Engeness, 2021). Knowledge sharing through a Thai MOOC open learning service to create content that is relevant to learners' interests by applying online networking platforms (Chen & Chen, 2022). Knowledge sharing is therefore a key factor towards actual use of Thai MOOCs open learning service success (Adelson & Keen, 2023; Salloum, Al-Emran et al., 2020).

Actual use had the lowest significant weight because people do not access Thai MOOCs open learning service daily. Users use them for different purposes. Although there are a variety of topics available in Thai MOOCs, many users are interested in specific topics (Karjaluo et al., 2020). Therefore, not many learners are interested in the wide range of topics provided by Thai MOOCs open learning service (Baturay, 2015). That is why actual use had the lowest significance. Other reasons behind this included the inability of learners to adapt to the new way of learning, lack of understanding of Thai MOOCs open learning service, and attitude of learners to learn new methods of learning (Sumaedi et al., 2020).

8. CONCLUSION

This paper provides useful insight into the Thai MOOCs open learning service because of the covid-19 pandemic changes global traditional face-to-face learning towards open learning service online learning (Drawan, 2020; Withers et al., 2021). The new normal open learning service includes online learning, distance learning with web-based social network pages, and a website to create content for chatting and discussion online, which led to more open online courses (Bonafin, 2017; Chiu & Hew, 2018). Learning via Thai MOOCs open learning service is different from traditional classroom or face-to-face learning due to less personal contact. However, distance learning can be accessed by a wider group of learners. This allows students to have more opportunities to independently participate in courses they are interested in (Cheng, 2023; Thompson, 2023).

Since 2008, MIT and Harvard University have cooperated on easy access and useful information delivering relevant to user interest in education (Almatrafi & Johri, 2019). Thailand's 20-year national plan has provided Thai own version of MOOCs open learning service. According to the results, 7 elements were found to contribute to the success of Thai MOOCs open learning services. The findings provided insights about the changes in education after the covid-19 pandemic situation and why online learning courses like Thai MOOCs open learning service are gaining interest at such a fast pace (Ramsey-Soroghaye et al., 2023).

The study provides the interrelationship of how the success of Thai MOOCs open learning service depends on advanced technological changes; this change applied chatting and discussion on social media platform involvement such as YouTube, Facebook pages, and other learning social media support programs (Seifert, 2023). This study employed theories and document review to analyze seven variables as the conceptual framework (Galikyan et al., 2021). The findings from literature review indicated the significance of the 7 variables which directly impacted the success of Thai MOOCs as an open learning service in Thailand (Hew, 2016). The limitation of this study can be resolved in further studies, and using more sources of data could help further researchers come up with lead to different factors that impact the success of Thai MOOCs open learning service.

The investigation applied mixed methods. The analysis of qualitative data employed Rough Set Theory and the Delphi Technique. 25 experts evaluated the validity of the questionnaire for three rounds. In round 1, an open-end questionnaire was reviewed by the experts who provided feedbacks related to the 7 variables. The feedbacks then were utilized to design the questionnaire in round 2. In Round 2, the experts evaluated questionnaire, and the consensus passed ($QL \geq 0.75$), as shown in Table 1. In round 3, the experts confirmed the questionnaires. In quantitative

analysis, data were collected from 800 Thai MOOC users utilizing the questionnaire with 7-point scale questions. Data analysis utilized the CFA outcome and results of first and second order to indicate how each component impacted the success of using Thai MOOCs in Thailand open learning services.

In summary, the measurement of the interrelationship of the 7 components found that it was clear that the components are all significant towards the success of using Thai MOOCs in Thailand Open Learning. Findings for this study provided useful information for the Thai MOOC officials, education institutions, and educators to receive insight for understanding the reforms in education in the post-Covid-19 pandemic environment. Changes due to technological advancement led to open learning services for the wider public to be used. The changes are part of Thailand's 20-year national strategic plan, so the success of Thai MOOCs open learning service is a significant factor contributing to educational reform. Further implementation of AI, ChatGPT, and other technologies will lead to educational improvement. The study of Thai MOOCs open learning service provides a good idea of how useful technological implementation is toward education (Bedeker, 2023).

9. SUGGESTIONS

Suggestions for future research

This research developed the questionnaire based on feedbacks and suggestions given by 25 experts divided into three groups based on their specializations. Future research may involve experts with different specializations who can provide different insights.

Following the results of the research, the seven key factors involved in the measurement of the success of using Thai MOOCs in Thailand open learning provided a better view of the topic. However, to better understand the topic, further research may investigate more factors to provide wider and deeper insights into developing Thai MOOCs open learning service that could possibly lead to different findings.

References

- Adelson, L. & Keen, G. S. (2023). F2F versus Online: Student Perceptions of Foreign Language Learning in the Time of COVID-19. *The Journal of Educators Online*, 20(2), 102-119. <https://doi.org/10.9743/JEO.2023.20.2.1>
- Aldowah, H., Al-Samarraie, H., Alzahrani, A. I., & Alalwan, N. (2020). Factors affecting student decision-making model. *Journal of Computing in Higher Education*, 32, 429-454. <https://doi.org/10.1007/s12528-019-09241-y>
- Alias, R., Ismail, M.H., & Sahiddan, N. (2015). A measurement model for leadership skills using confirmatory factor analysis (CFA). *Procedia-Social and Behavioral Sciences*, 172, 717-724. <https://doi.org/10.1016/j.sbspro.2015.01.424>
- Almatrafi, O., & Johri, A. (2019). Systematic review of discussion forums in massive open online courses (MOOCs). *IEEE Transactions on Learning Technologies*, 12(3), 413-428. <https://doi.org/10.1109/TLT.2018.2859304>
- Badali, M., Hatami, J., Banihashem, S. K., Rahimi, E., Noroozi, O., & Eslami, Z. (2022). The role of motivation in MOOCs' retention rates: A systematic literature review. *Research and Practice in Technology Enhanced Learning*, 17(1), 5. <https://doi.org/10.1186/s41039-022-00181-3>
- Baturay, M. H. (2015). An overview of the world of MOOCs. *Procedia—Social and Behavioral Sciences*, 174, 427-433. <https://doi.org/10.1016/j.sbspro.2015.01.685>
- Bedeker, M. (2023). COVID-19 Resulted in Classrooms Without Walls: What can Pedagogical and Content (PCK) Offer? *The Journal of Educators Online*, 20(2), 88-101. <https://doi.org/10.9743/JEO.2023.20.2.2>
- Beer, N. (2019). Designing a rubric to measure elements of transformative learning in online learning: A case study of a FutureLearn MOOC. *Journal of Interactive Media in Education*, 2019(1), 7. <https://doi.org/10.5334/jime.506>
- Bonafin, F. C. (2017). The effects of participants' engagement with videos and forums in a MOOC for teachers' professional development. *Open Praxis*, 9(4), 433-447. <https://doi.org/10.5944/openpraxis.9.4.63>
- Bozkurt, A., & Keefer, J. (2018). Participatory learning culture and community formation in connectivist MOOCs. *Interactive Learning Environments*, 26(6), 776-788. <https://doi.org/10.1080/10494820.2017.1412988>
- Chairaksa, N., & Pankham, S. (2023). Successful Entrepreneurs of Online Small and Medium Enterprises in Thailand. *Academic Journal of Interdisciplinary Studies*, 12(3), 336.

- <https://doi.org/10.36941/ajis-2023-0082> Chairaksa, N., & Pankham, S. (2023). Modern Entrepreneur for the Success of Online Businesses for Small and Medium Enterprise in Thailand. *TEM Journal*, 12(2), 956-966. <https://doi.org/10.18421/TEM122-42>
- Chen, P. J., & Chen, Y. H. (2022). Massive open online course study group: Interaction patterns in face-to-face and online (Facebook) discussions. *Frontiers in Psychology*, 12, 670533. <https://doi.org/10.3389/fpsyg.2021.670533>
- Cheng, K. Y. (2023). HyFlex Challenges and Strategies for Matured Learners: Construction Engineering Higher Education in New Zealand During the Pandemic. *The Journal of Educators Online*, 20(3), 120-131. <https://doi.org/10.9743/JEO.2023.20.2.3>
- Chiu, T. K., & Hew, T. K. (2018). Factors influencing peer learning and performance in MOOC asynchronous online discussion forum. *Australasian Journal of Educational Technology*, 34(4). <https://doi.org/10.14742/ajet.3240>
- Dhamdhare, S., Dhamnikar, V., Gaikwad, A. & Tikhe, S. (2024). Study of Use of an Additional Reading Material in SWAYAM MOOC Platform in India and Need of Learner Centric Personalized Adaptive Real-Time Reading Material in MOOCs. *The Journal of Educators Online*, 21(1), 39-48. <https://doi.org/10.9743/JEO.2024.21.1.4>
- Dhawan S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
2. Deng, R., Benckendorff, P., & Gannaway, D. (2020). Learner engagement in MOOCs: Scale development and validation. *British Journal of Educational Technology*, 51(1), 245–262. <https://doi.org/10.1111/bjet.12810>
 - De Vos, J. (2020). The effect of COVID-19 and subsequent social distancing on travel behavior. *Transportation Research Interdisciplinary Perspectives*, 5, 100121. <https://doi.org/10.1016/j.trip.2020.100121>
 - Galikyan, I., Admiraal, W., & Kester, L. (2021). MOOC discussion forums: The interplay of the cognitive and the social. *Computers & Education*, 165, 104133. <https://doi.org/10.1016/j.compedu.2021.104133>
 - Gamage, D., Fernando, S., & Perera, I. (2020). MOOCs lack interactivity and collaborativeness: Evaluating MOOC platforms. *International Journal of Engineering Pedagogy* 10(2), 94– 111. <https://doi.org/10.3991/ijep.v10i2.11886>
 - Hew, K. F. (2016). Promoting engagement in online courses: What strategies can we learn from three highly rated MOOCs. *British Journal of Educational Technology*, 47(2), 320–341
 - Research, 11(1), pp. 325 - 344. <https://doi.org/10.1111/bjet.12235>
 - Hoelter, J. W. (1983). The analysis of covariance structures: Goodness-of-fit indices. *Sociological Methods and Research*, 11(1), pp. 325 - 344. <https://doi.org/10.1177/0049124183011003003>
 - Kalinic, Z., Marinkovic, V., Molinillo, S., Liebana-Cabanillas, F. (2019). A multianalytical approach to peer-to-peer mobile payment acceptance prediction. *Journal of Retailing and Consumer Service*, 49, 143-153. <https://doi.org/10.1016/j.jretconser.2019.03.016>
 - Kao, R. H., & Lin, C. T. (2018). The usage intention of e-learning for police education and training. *An International Journal of Police Strategies and Management*, 41(1), 98- 112. <https://doi.org/10.1108/PIJPSM-10-2016-0157>
 - Karjaluo, H., Shaikh, A., Leppaniemi, M., & Luomala, R. (2020). Examining consumers' usage intention of contactless payment systems. *International Journal of Bank Marketing*, 38(2), 332-351. <https://doi.org/10.1108/IJBM-04-2019-0155>
 - Kitcharoen, K., & Vongurai, R. (2021). Factors influencing customer attitude and behavioral intention towards consuming dietary supplements. *AU-GSB E-Journal*, 13(2), 94- 109. <http://www.assumptionjournal.au.edu/index.php/AU-GSB/article/view/5231>
 - Kong, E. H. (2023). Incorporating Partial Student Self-Grading Model in the Remote Learning System (Post COVID-19). *The Journal of Educators Online*, 20 (2), 179-184. <https://doi.org/10.9743/JEO.2023.20.2.4>
 - Kurniawan, Y., Candra, S. & Tungka, L.Y. (2021). E-Learning: MOOC User Intention Analysis Using TAM and TTF with Social Motivation Factor and MOOC Features. *Springer Nature Switzerland . Digital Literacy and Socio-Cultural Acceptance of ICT in Developing Countries*. https://doi.org/10.1007/978-3-030-61089-0_7
 - Legg-Jack, D. W. & Ndebele, C. (2023). Exploring Technology Education Students' Perception on the Use of Emergency Remote Learning Amid COVID-19 Pandemic. *The Journal of Educators Online*, 20(2), 75-87. <https://doi.org/10.9743/JEO.2023.20.2.5>
 3. Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning*, 22(1), 205–222. <http://dx.doi.org/10.24059/olj.v22i1.1092>
 - Martin, F., Wang, C., & Sadaf, A. (2020). Facilitation

- matters: Instructor perception of helpfulness of facilitation strategies in online courses. *Online Learning*, 24(1). <http://dx.doi.org/10.24059/olj.v24i1.1980> Nassr, R. M., Alkhnbashi, O. S., Aldossary, A. A., Bamasoud, D. M. & Ungku Amiruddin, U. N. (2023). DO STUDENTS HAVE EQUAL PERCEPTIONS OF E-LEARNING DURING THE COVID-19 PANDEMIC? A CROSS-SECTIONAL STUDY INVESTIGATED THE DIFFERENCES IN STUDENTS' PERCEPTIONS TOWARDS THE DETERMINANTS THAT INFLUENCE SOLE E- LEARNING USE. *The Journal of Educators Online*, 20(2), 164-183. <https://doi.org/10.9743/JEO.2023.20.2.7> Neuschafer, T. (2023). Understanding Duolingo Discussion Boards As Social-Emotional Support During the Covid-19 Pandemic. *The Journal of Educators Online*, 20 (1), 35-48. <https://doi.org/10.9743/jeo.2024.21.2.16> Ramsey-Soroghay, B. N., Emejuru, P. I., Solomon-Zacchaeus, I. H. & Abur, W. (2023). Strategizing from the COVID-19 Pandemic Experience on the Advancement in Virtual Learning in Nigeria. *The Journal of Educators Online*, 20(2), 31-39. <https://doi.org/10.9743/JEO.2023.20.2.9> Salloum, S. A., Al-Emra, M., Habes, Mo., & Alghizzawi, M. (2019). Understanding the Impact Of Social Media Practices on E-Learning Systems Acceptance. <https://doi.org/10.1007/978-3-030-31129-2> Salloum, S. A., Al-Emran, M., HabM., Alghizzawi, M., Ghani, M. A. & Shaalan, K. (2020). Understanding the Impact of Social Media Practices on E-Learning Systems Acceptance. *Springer Nature Switzerland*, 360–369. https://doi.org/10.1007/978-3-030-31129-2_33 Seifert, T. (2023). Fostering Collaborative and Constructivist Learning Through the Flipped Classroom During COVID-19. *The Journal of Educators Online*, 20(2), 132-144. <https://doi.org/10.9743/JEO.2023.20.2.11> Sindiani, A.M., Obeidat, N., Alshdaifat, E., Elsalem, L., Alwani, M. M., Rawashdeh, H., Fares, A. S., Alalawne, T. & Tawalbeh, L. I. (2020). Distance education during the COVID-19 outbreak: A cross JOURNAL OF EDUCATORS ONLINE sectional study among medical students in North of Jordan. *Annals of Medicine and Surgery*, 59, 186–194. <https://doi.org/10.1016/j.amsu.2020.09.036> Singh, A. B., & Engeness, I. (2021). Examining information and communication technology massive open online course. *Cultural- Historical Psychology*, 17(2), 76–89. <https://doi.org/10.17759/chp.2021170208> Singh, A. B., & Mørch, A. (2024). Instructors' Epistemic Intervention Strategies in MOOC Discussion Forums. *The Journal of Educators Online*, 21(1), 49-66. <https://doi.org/10.9743/JEO.2024.21.1.5> Sumaedi, S., Bakti, I., Rakhmawati, T., Astrini, N. J., & Jati, R. K. (2020). A model of intention to use official covid-19 websites. *Health Education*, 120 (4), 249-26. <https://doi.org/10.1108/HE-07-2020-0048> Swartzwelder, K., Murphy, J. & Myers, J. (2023). Factors Influencing Student Persistence in Online Courses During the Pandemic: A Mixed-Methods Study. *The Journal of Educators Online*, 20(2), 6-14. <https://doi.org/10.9743/JEO.2023.20.2.12> Thailand Cyber University. (2018). Statistics for the TCU. <https://www.thaicyberu.go.th/> Thailand Massive Open Online Course. (2023). Thai MOOC Education System Users Since 2016 until 2022 Statistics. <https://mooc.global/thai-mooc> Thompson, N. L. (2023). A Comparison of Online, Blended, and Face-to-Face Learning Modes on Achievement in the Caribbean. *The Journal of Educators Online*, 20(2), 49-58. <https://doi.org/10.9743/JEO.2023.20.2.13> Wang, C., Cardullo, V., Burton, M., Salisbury-Glennon, J. & Serafini, A. (2023). Teaching Online During Covid-19: Teacher Self-efficacy and the Extended Technology Acceptance Model. *The Journal of Educators Online*, 20(2), 151-163. <https://doi.org/10.9743/jeo.2023.20.2.14>
4. Withers, M., Monfared, M., Fung, F. M., Lee, V. W. Y., Lucio Ramirez, C. A., Mendoza, M. A. F., Zhou, C., & Vandegrift, E. V. H. (2021). Teaching in virtual environments: Global educational development to respond to challenges and opportunities of the COVID-19 pandemic. *Transformative Dialogues: Teaching & Learning Journal*, 14(2), 41–60. <https://journals.kpu.ca/index.php/td/article/download/1513/1039/>
 5. Wiratchai, N. (1999). *Lisrail Model: Analytical Statistics for research* (3rd edition). Bangkok: Chulalongkorn University Printing House.