

**THE INTEGRATION OF PERCEIVED AUTONOMY, AND ABSORPTIVE
CAPACITY TO UTAUT MODEL: AN EMPIRICAL INVESTIGATION
OF STUDENTS' INTENTION TO USE MOOCS
IN THAILAND AND PAKISTAN**



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เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้



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Dissertation Title	The Integration of Perceived Autonomy, and Absorptive Capacity to UTAUT Model: An Empirical Investigation of Students' Intention to Use MOOCs in Thailand and Pakistan
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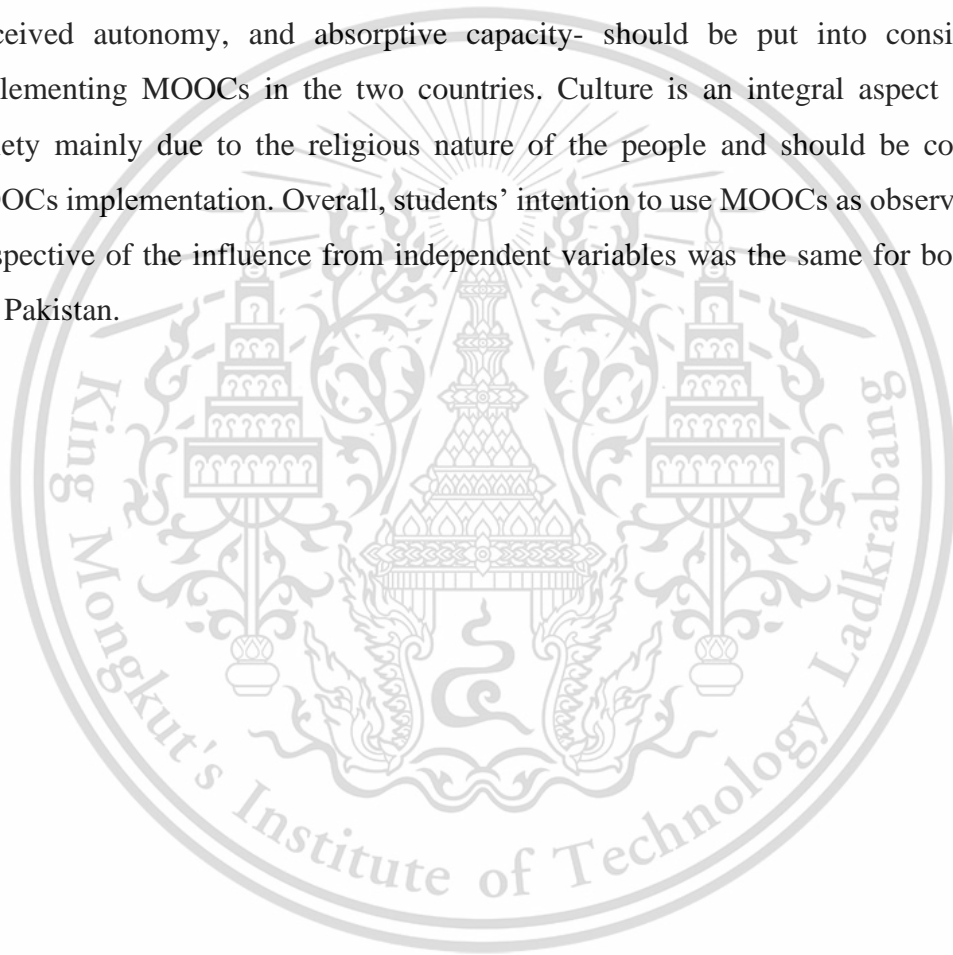
ABSTRACT

This research aims to empirically investigate students' behavioral intention to use MOOCs in Thailand and Pakistan. The study adopted an extended UTAUT model with an extension to include perceived autonomy and absorptive capacity variables. The study's objectives included determining factors influencing students' behavioral intention to use MOOCs, the moderation effect of culture, and comparing the results of Thailand and Pakistan on multigroup analysis.

The empirical analysis used data collected from 513 and 490 respondents in Thailand and Pakistan, respectively. Analysis was done using confirmatory factor analysis (CFA), structural equation modeling (SEM), and multi-group SEM analysis. The study revealed that four variables - social influence, absorptive capacity, facilitating conditions, and perceived autonomy - significantly influence the students' intention to use MOOCs in Thailand and Pakistan. However, two variables - performance expectancy and effort expectancy - do not influence students' intention to use MOOCs in Thailand and Pakistan. The culture was a moderating variable for all latent variables, and the results revealed that

for Thailand, culture did not moderate any relationship between endogenous and exogenous variables. However, for Pakistan, culture significantly moderated the relationship between performance expectancy and students' behavioral intention to use MOOCs; and the relationship between facilitating condition and students' behavioral intention to use MOOCs. The multigroup analysis revealed that findings between the two countries were invariant.

The study concluded that four factors - social influence, facilitating conditions, perceived autonomy, and absorptive capacity- should be put into consideration in implementing MOOCs in the two countries. Culture is an integral aspect of Pakistan society mainly due to the religious nature of the people and should be considered in MOOCs implementation. Overall, students' intention to use MOOCs as observed from the perspective of the influence from independent variables was the same for both Thailand and Pakistan.



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CHAPTER 1

INTRODUCTION

1.1 Background and Research Significance

As a result of the continuous progress and advancements in the fields of Information Technology, there are ever-increasing technological innovations supported by the internet. Massive Open Online Courses (MOOCs) is among the recent technological advancement in the education sector. It is a modern method of learning that takes place in the online environment. MOOCs major characteristic is that it provides open access to unlimited participants, enabling more than the traditional modes and materials such as lectures, quizzes, communities, and interactive forums (Liyaganawardena, 2015). MOOCs were necessitated in this digital era, with the need to gather knowledge at a faster pace and lifelong learning, hence new and advanced techniques had to be developed to address the learners' needs (Hew & Cheung, 2014). According to Jordan (2015), MOOCs could be considered as web-based platforms, designed to deliver education and classes in a new paradigm, without hindrances of the geographical boundaries, time zones, and to many audiences. The significant difference between the MOOCs are previous online approaches is that MOOCs are free (Evans, Baker & Dee, 2016). Additionally, MOOCs employs a different pedagogy from 'traditional online learning' since the learning takes place in 'flipped classes' where the instructor uses the internet and other technologies to allow student learn new knowledge that was preferably delivered via lecture format.

The MOOCs are revolutionizing the higher education system, in addition to gaining a great deal of attention from educational professionals, entrepreneurial vendors, media, and the technologically literate section of the society (Jung & Lee, 2018). The cutting edge of this system is that they provide free access, unlimited tutorial courses, which could decrease the cost of university and college-level education, and potentially disrupt the existing higher education model (Weinhardt & Sitzmann, 2019). This has encouraged many universities to put their courses online using open learning platforms such as edX. It has also led to the establishment of commercial start-ups such as Coursera and Udacity,

which collaborate with universities to offer online courses for free or charging a small fee for certification.

Though MOOCs is associated with various advantages such as flexibility, free access, and diversity and career benefits, it is also associated with several issues. These issues include high number of students drops outs (Ho et al., 2015), resistance to technology adoption, disruption of the traditional learning system, and lack of appropriate skills in teaching through the MOOCs platforms. These issues necessitated this study, which was consulted by adopting the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This study extended the UTAUT model by including two additional variables – perceived autonomy and absorptive capacity. The study was carried out in Thailand and Pakistan. Thailand and Pakistan were considered suitable for the study considering that both have adopted the technology, have proved to be beneficial in the institutions of higher learning. However, it has not fully been integrated into the education system. Therefore, the study contributed significantly to the efforts towards the adoption of technology in the education system.

1.2 Research Problems

MOOCs have become increasingly popular, leading to the establishment of many platforms all over the world. The technology has been completely absorbed in the education system, as a new learning technique of the digital era. The most prominent MOOCs platforms include Udacity, Coursera, and edX. Udacity is an American non-profit educational organization, which offers online courses in the various specialization area. Coursera is an American open online course provide which collaborates with universities and other organizations to offer online courses and certification in various subjects. edX, an open online course provider, was created by Harvard, and MIT hosts online university-level courses. There are other platforms in different countries such as Miriada in Spain, Inversity in Germany, FutureLearn in England, XuetaangX in China, Khan Academy in North America, Open2Study in Australia, Fun in France, Veduca in Brazil, and Schoo in Japan (Qiu et al. 2016). By the end of 2017, MOOCs platforms were offering more than 9,400 courses and registered more than 81,000 000 students worldwide (Shah 2018).

According to the recent survey conducted by Coursera, the course offered at MOOCs are hugely beneficial to those students who complete their courses. From the study statistics, 61% indicated educational benefits from the courses, and among them, 72% stated that they gained career benefits (Zhenghao, Alcorn, Christensen, Eriksson, Koller & Emanuel, 2015).

However, despite the educational and career benefits to the students, and the MOOCs associated advantages such as flexibility, free access, and diversity, there are still some critical issues that arise in connection with the adoption of MOOCs.

The first issue is the number of students who complete the program and skip to drop out (Ho et al., 2015). As a result, two questions arise; first, what factors influence students' behavior intention to use MOOC? and second, what are the factors that lead to students dropping out of the course? The volume of candidates, who leave the eLearning activity without completing, may be hard to relate with MOOC's effectiveness, but inevitably it questions many related factors.

The second problem is the resistance to the adoption of technology. As noted by Im, Hong & Kang (2011), fear of adopting technology is an obstacle to technology adoption. There could be many potential MOOCs enthusiasts but may not start due to fear of technology (Hsia, 2003), computer-based anxiety (Huang, Hood, & Yoo, 2013), or else. Their attitude towards MOOC can be influenced by their use of the internet and other facilitating factors (Indrawait & Has, 2017).

The third problem posed by the adoption of the MOOCs within the education system is the exclusion of the traditional learning elements. According to critiques of MOOCs, the technology provides a 'disruptive competition' to the status-quo, by eliminating some traditional learning elements such as physical enrollment, physical class attendance, and evaluation elements (Flavin, 2017; Welsh & Dragusin, 2013).

The MOOCs are disruptive because they have a significant effect on the business and delivery model of higher education institutions. The aspects affected include an untapped audience, replacing the accredited university courses, and disrupting the traditional credit-hour system. The absence of teacher-student direct interaction is a critical issue since it lacks some critical features such as assessment of students' understanding,

and students are not able to ask an immediate question to their teachers where they have queries (Hew & Cheung, 2014).

Another vital issue that comes out is the lack of expertise and training required in using MOOCs. MOOCs need tutors and teachers to be well versed with technology and computer operations to prepare lectures and tutorials, which involves video recording in some cases. Some of the teachers may lack these skills hence hindering their ability to transfer their knowledge (Chen, 2017). To learn about MOOCs, students need computers and internet access. Some students may not be able to afford these necessities for MOOCs, particularly in developing countries. This may affect the intention of the user to undertake the course (Indrawati & Has, 2017).

In general, not much research work has been performed in the context of behavioral intention to use MOOCs in Thailand and Pakistan. This study addressed this issue discussed above and fill the gap by investigating the factors that influence the behavioral intention of the user to adopt MOOCs in Thailand and Pakistan. By adopting MOOCs, various changes could be made in the existing education system of Thailand and Pakistan. These include increased interest in education for non-traditional students, provision of another option for skills training, investment in alternative credentials, and reduce the stigma of online learning.

1.3 Research Questions

This research was geared towards answering the following research questions

RQ1: What are the factors influencing the behavioral intention to use MOOCs in Thailand and Pakistan?

RQ2: What is the difference between Thailand and Pakistan in terms of factors influencing the behavioral intention to use MOOCs?

RQ3: How does the integration of perceived autonomy, and absorptive capacity to UTAUT Model influence the behavioral intention to use MOOCs in Thailand and Pakistan?

1.4 Research Objectives

The main research objective is to empirically investigate the students' behavioral intention to Use MOOCs by incorporating the Integration of Perceived Autonomy and Absorptive Capacity to UTAUT Model. The specific objectives were:

1. To empirically determine the effects of behavioral intention to use MOOCs in Thailand and Pakistan
2. To empirically determine the moderation effect of culture on behavioral intention to use MOOCs in Thailand and Pakistan
3. To compare the results of Thailand and Pakistan on multigroup analysis on behavioral intention to use MOOCs in Thailand and Pakistan
4. To develop a technology acceptance model for the behavioral intention to use MOOCs in Thailand and Pakistan

1.5 Significance of the Study

The findings of this study are beneficial to several stakeholders such as the ministry of education, universities and learning institutions, students, and other MOOCs investors. The ministry of education in the two countries i.e., Thailand and Pakistan, will understand how technology affects the education system. Using the findings, the policymakers in the sector could develop strategies that are steering the industry forward. The universities and learning institutions will understand the behavioral factors that influence the students' decision to enroll in MOOCs. They will also appreciate the factors that could be responsible for the high rate of dropouts from the MOOCs courses, hence be in a position to propose new methods of improving their effectiveness. With the improvement in technology, and the adoption of MOOCs by the renowned universities to deliver various courses online, the results of this study were significant determining the factors that would influence the enrolment and completion of students to various courses, their academic relevance, as well as their future career applications. The research will add value to the existing body of knowledge regarding MOOCs, as well as proposing research gaps that could be researched by future studies.

1.6 Scope of the Study

Scope of Content: The study used the UTAUT model as the basis of the theoretical framework, which illustrates the behavior of users' adoption of technology. The major constructs of the UTAUT model include performance expectancy, effort expectancy, social influence, facilitating conditions, behavioral intention, and user behavior. For the purpose of this study, the UTAUT model was extended to include the perceived autonomy and absorptive capacity variables. For the research of the integration of Perceived Autonomy and Absorptive Capacity to UTAUT Model in an Empirical Investigation of Students' Intention to Use MOOC in Thailand and Pakistan, the scope of the research is as follows:

Variables: the variables used in this study are in three categories, exogenous variables, endogenous variables, and mediating variables.

a) The exogenous latent variables consisted of observed variables:

- i) Performance expectancy
 - Perceived usefulness
 - Relative advantage
 - Outcome expectations
- ii) Effort expectancy
 - Perceived effort
 - Ease of use
- iii) Social influence
 - General social influence
 - Peer social influence
- iv) Facilitating conditions
 - Perceived Behavioral Control
 - Facilitating Conditions
- v) Perceived Autonomy
 - Sense of responsibility
 - Self-confidence
 - Freedom

- vi) Absorptive Capacity
 - Knowledge acquisition
 - Knowledge assimilation
 - Knowledge transformation
- b) The moderating latent variable consisted of
 - i) Culture, with two observed variables
 - Uncertainty Avoidance
 - Individualism/collectivism
 - c) Endogenous Latent variables consisted of observed variables
 - i) Behavioral intention to use
 - Intention
 - Prediction
 - Planning

Scope of Population: The population size of this study was very large, with more than 100 million students enrolled in MOOCs online and thousands in Pakistan and Thailand (Shah, 2019). The population consisted of individuals who are potential users of MOOCs in Thailand and Pakistan. They included professional employees or university students. It is from this population that a representative sample of the research respondents was obtained.

The research implementation of the study is divided into two sections, as discussed below:

Part 1: Review of existing literature related to the current study from various sources such as peer-reviewed articles, books, magazines, and other credible sources.

Part 2: Collection of primary quantitative data from the selected sample respondents. The data was collected using a structured questionnaire.

Scope of Time: The study took 3 years to complete including ethical committee approval, data collection, data analysis, publication of articles, and final proofreading to incorporate all committee member comments. Data was collected between January and April 2021.

1.7 Definition of Terms

- **MOOCs:** A web-based education system which is designed to offer courses to wide range people and students, for free, and without geographical limitation.
- **Behavioral Intention:** Implies the individual's intention to perform act, which could predict a given behavior when an individual act voluntarily.
- **Performance Expectancy:** Implies the degree to which an individual believes that using a system could be helpful to do better in job performance.
- **Effort expectancy:** Implies the degree of ease that is associated with the use of a particular technological system.
- **Social Influence:** Implies the degree to which a person perceives the importance of others believes that he or she should use the new technology system.
- **Facilitating conditions:** Implies the perception of an individual regarding the available resources and support to perform a behavior.
- **Perceived autonomy:** Implies the degree to which an individual experiences or exercises the freedom of choice in terms of ability to lead a self-determined life.
- **Absorptive capacity:** Implies the ability to locate and apply new ideas, technology, and innovation and incorporate them within the existing subjective knowledge.
- **Culture:** Implies the collective programming of the mind, which distinguishes the members of a particular group from the others.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section presents the literature of the study. It incorporates the review of the previous literature related to the topic of the study, and the theory grounding the study. The first section discusses the MOOCs and its associated concept in Thailand and Pakistan. The second section discusses the design of MOOCs, and the third section discusses the UTAUT model, which is the theory on which this study is grounded. The next section of the chapter discusses the concepts and theories of the research constructs. The chapter goes forward to discuss the relationship between the study constructs and ends by presenting the conceptual framework of the study.

2.2 Massive Open Online Courses (MOOCs)

The Massive Open Online Courses (MOOCs) represent a disruptive educational trend, particularly in the higher education sector and lifelong learning (McGuire, 2014). These new technology platforms are allowing the spread of education and learning in various areas and fields and surpassing traditional online courses. This is with the application of a more conventional approach of xMOOCs, majorly applied by platforms such as Coursera, Udacity, edX, or Miriádash, as well as the one based on the connective pedagogy approach of cMOOCs (Kay, Reimann, Diebold & Kummerfeld (2013). As a result, more and more institutions of higher learning are adopting MOOCs technology, and more educators are embracing the aspect of offering courses online using MOOCs. The increasing interest in MOOCs and its associated enhancement through technology increases the opportunities for the exploration of more online pedagogies and business models within the education system. However, Seeman, Drake & Maysami (2013) argue that through MOOCs offers an advanced method of learning, designing and establishing it from scratch is associated with various issues, such as logistical, technological, financial,

and pedagogical must be faced by the educators. For instance, concerning designing and running MOOCs, the concerned institutions and educators should be aware that MOOCs are quite demanding, hence require careful planning and feasibility of the course, as well as the availability of resources such as finance and human resources skills.

Inferring from the survey conducted by Waters (2014), the MOOCs typically require a substantive amount of time to run a single course for the first time and additional hours per week to upkeep and update the trail while running it. The study also indicated that MOOCs learners find it challenging to find a balance between their daily duties and their MOOCs, courses, and diverting enough time to MOOCs from their regular responsibilities or research and traditional teaching. Therefore, the overall performance of a course on MOOCs could depend on the duration and subject of the course and the materials used by the instructors. According to the survey conducted by Adamopoulos (2013), MOOCs educators should consider the relationship between logistical issues and design decisions to deliver successfully. Concerning the technological issues, institutions and educators should be aware of the supporting systems used to run MOOCs. The most common aspect being applied nowadays by educators is to centralize access to learning content and materials.

2.2.1 MOOCs in the Education System

As a result of the open access, open educational resources, and the recent open online courses, there is an increasing momentum in many higher education institutions to participate in this ‘open’ movement. The idea of MOOCs is rooted in the education openness, which advocates that knowledge should be shared openly and freely, and the learning inspirations should be met without economic, geographic, or demographic constraints (Suen, 2014). Since the year 2000, the concept of open education and its associated MOOCs technology has experienced a rapid evolution. In 2002, the Massachusetts Institute of Technology (MIT) opened an Open Courseware, and in the year 2006, the Open University established OpenLearn (Evans, Baker & Dee, 2016). Influenced by these open learn developed, other elite institutions established MOOCs in 2012, such as MIT, edX, and OU’s Future Learn. The United Kingdom Open Educational Resource that was launched in 2009, has made significant progress in availing a wide range of free

teaching and learning resources worldwide (JISC, 2012). In the higher education sector, MOOC is currently offered by high-prestige name-brand universities. It is also taught in both high-profile and low-profile faculty in diverse topics. The list of the worldwide higher learning institutions offering MOOCs is growing exponentially. Currently, there are more than 50 institutions listed in the US News top 25 best-colleges' rankings for 2018 offer MOOCs. These institutions include Harvard, Yale, Duke, University of Virginia, Dartmouth, MIT, among others. More importantly, prestigious institutions in Asia, Canada, Australia, and the Middle East have also adopted MOOCs.

Considering the motivation from the learners' perspective, the participation of students in MOOCs is of great interest to the higher education stakeholders. The factors that influence the students to MOOCs include learning flexibility, economic benefit, personal and professional identity, challenge, and achievement, as well as learning as fun. According to a survey conducted by Duke University researchers, four significant categories motivate students to undertake MOOCs (Belanger and Thornton, 2013). These include exploring and experiencing online education for convenience, which comes from the elimination of barriers encountered in the traditional educational system, supporting lifelong learning and acquiring knowledge and understanding of the topic concept, and fun and entertainment of intellectual stimulation.

2.2.2 MOOCs in Developing countries Education System

MOOCs have brought education, knowledge, and skills from the top universities across the world to the least privileged scholar in an emerging country (Thorpe, 2009). Through MOOCs, there most skilled professors and experts can share their expertise and knowledge to knowledge and skill hungry individuals, lack of time, and geographical hindrances. This would come at a low or no cost. Inferring from Hew & Cheung (2014), MOOCs have brought the revolution to the education, particularly the higher education in developing countries, where attendance of higher education or entrance to a university is a privilege. An excellent example of how the MOOC had impacted the education system in the developing countries is edX. edX is a nonprofit platform developed by Harvard University. The platform boasts of having approximately 15% of the registered students

have come from developing countries. For instance, India alone has more than 300,000 registered students on edX.

In a similar tone, the MOOCs have been established in various developing countries, both as individual for-profit platforms and others in collaboration with the government of the country or education ministry. Some countries that have embraced the technology, including Thailand, China, Israel, India, Pakistan, among others, have witnessed significant improvements in the education sector. In addition to supporting higher education in these developing countries, these MOOCs effectively reduce the level of illiteracy in those regions.

2.2.3 MOOCs usage World-Wide

MOOCs marked its first recognition when launched some free online courses to the public in 2011. These courses received massive enrollment, more than 100,000 each. Since then, more than 1000 universities around the world have adopted this technology of MOOCs. By the end of 2018, there were more than 100 million students already enrolled in different MOOCs courses around the world (Shah, 2019). There have been established many global MOOCs platforms such as Coursera, edX, and Future Learn, while some governments have partnered with their universities to launch MOOCs platforms. The table below presents a summary of internationally recognized and well-known MOOCs platforms with respect to their category, as commercial or non-profit, as well as the year in which they were established.

Table 2.1. Description of MOOCs platform characteristics

Platform	Category	Country	Platform	Category	Country
edX	Not for profit	USA	OpenLearning	For profit	Australia
FutureLearn	For profit	UK	OpenClassroom	For profit	France
Alison	For profit	Ireland	Coursera	For profit	USA
Iversity	For profit	EU	Open2study	For profit	Australia
Canvas Network	For profit	USA	OpenSAP	Not for profit	Germany

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ตัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Platform	Category	Country	Platform	Category	Country
Shaw Academy	For profit	Ireland	Eliademy	For profit	Finland
Coursmos	For profit	USA	Stanford Online	Not for profit	USA
Kadenze	For profit	USA	The Great Course	For profit	USA
Khan Academy	Not for profit	USA	Udemy	For profit	USA
Linkedin Learning	For profit	USA	Swayam	Not for profit	India
Udacity	For profit	USA	Polhn	Not for profit	W. Pacific
ThaiMOOC	Not for profit	Thailand	XuetangX	Not for profit	China
Miriadax	Not for profit	Spain	MexicoX	Not for profit	Mexico
FUN	Not for profit	France	EduOpen	Not for profit	Italy
NPTEL	Not for profit	India	Federeca.eu	Not for profit	Italy
Campusiil	Not for profit	Israel	CNMOOC	For profit	China
Ewant	Not for profit	Taiwan	Edraak	Not for profit	Jordan

Source: Class central (2019)

The listed above are just a few of the well-known MOOCs. It is evident from the above table that MOOCs have been adopted by both the developed as well as developing nations. They are considered more beneficial to the people who have low educational

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benefits and lower social-economic status, as they have an opportunity to upgrade themselves in terms of knowledge and skills.

According to Blackmon and Major (2017), MOOCs are coming as a revolution in the developing countries. The developing countries are usually faced with a lack of university entry spaces, while at the same time, there are significant barriers to entry. Therefore, the MOOCs in the developing nations present a comprehensive opportunity for exploration, as well as an extension of education to those who lack the opportunity to join higher education. MOOCs have tangible career benefits to those who undertake them. Instead of experiencing some vague improvement in their career prospects, research has indicated that approximately 33% of the people who have undertaken MOOCs in the developing countries have experienced an increase in their career benefits. These tangible benefits include finding a new job, starting a business, or receiving a pay rise or promotion. Those who have joined the MOOCs with the main objective of advancing their career have been reported to experience the most outcome.

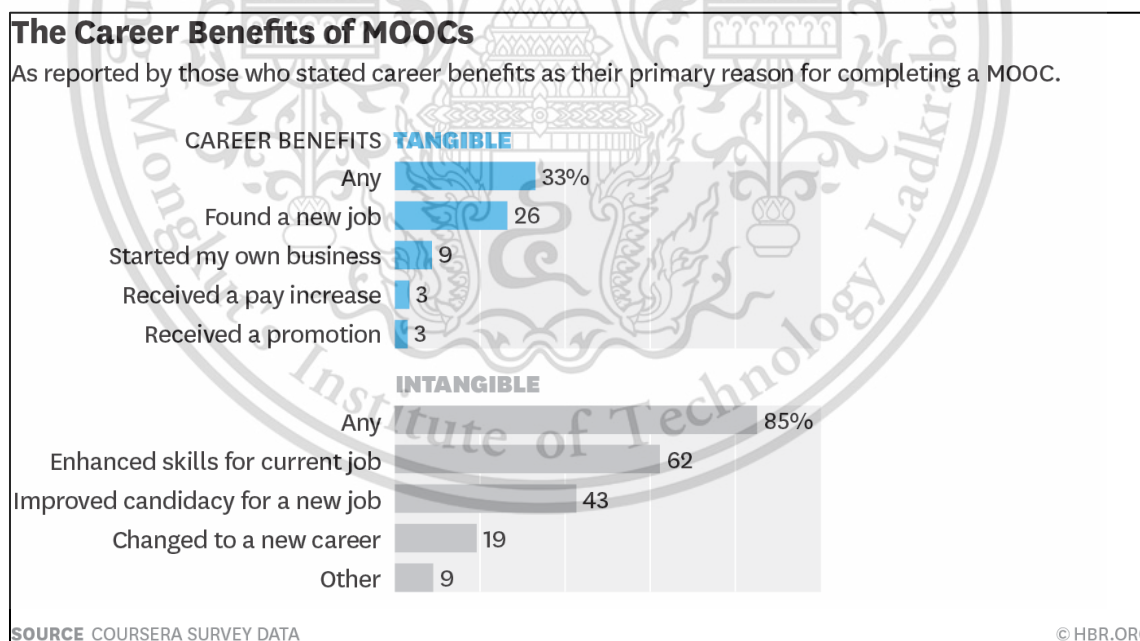


Figure 2.1: Career Benefits of MOOCs

Source: Coursera Survey Data (2019)

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These findings have prompted this research to investigate the adoption of MOOCs in the developing countries, specifically Thailand and Pakistan. There are several reasons which justify the choice of these developing countries. First, there are rare opportunities in universities and institutions of higher learning for a large number of students. Hence MOOCs come as an effective alternative where an interested individual could learn and add their skills and expertise to their profession. Specifically, Pakistan and Thailand were chosen due to their large sizes population, particularly the young generations. Considering their high requirement for extended education and expertise, it proved relevant to analyze their adoption of MOOCs.

2.2.4 MOOCs in Pakistan and Thailand

Both Pakistan and Thailand have adopted the MOOCs technology in their educational system. Considering that they are developing countries, the system is not fully integrated, but has proved beneficial, especially to the institutions of higher learning (Cinque, 2017). In Thailand, there is one MOOCs, which was launched in the year 2017. The platform is known as ThaiMOOC, which is the official MOOC platform in Thailand. It is not for profit platform where the courses are offered for free. The platform has been developed on Open edX, currently offering more than 50 different courses. Its initiation is marked with the first summit of the Asian-Pacific MOOCs stakeholders, held in Thailand in 2017 (Karnasuta, 2018). The conference was organized by the UNESCO Bangkok, and the other three national partners, which include JMOOC, K-MOOC and ThaiMOOC. Another MOOC platform in Thailand is Thailand Cyber University Project (TCU), established by the Ministry of Education in collaboration with universities. It offers more than 800 lessons in various courses (Bowon, Wang, & Yamada, 2015). There are other MOOCs in Thailand, such as CHULA MOOC, MUx, SkillLane, and Taladpanya (Karnasuta, 2018). In Pakistan, the adoption of MOOCs within the higher education system has not been fully integrated. There exists the Allama Iqbal Open University and the Virtual University of Pakistan, which utilizes both the MOOCs and blended learning pedagogies. From the fact that most universities in Pakistan are offering distance learning, these programs need to be aligned with quality-based MOOCs.

2.2.5 Different Types of MOOCs

There are two major categories of MOOCs, cMOOC, and xMOOC. These are independently discussed below.

xMOOC

xMOOC is a content-based type of MOOCs, which adopts a ‘behaviorist’ approach, which is usually dominated by the ‘drill’ and ‘grill’ instructional methods. xMOOC stands for eXtended Massive Open Learning Course. This type of MOOC, with its background in the behaviorism theory, is based on the concept that all behaviors are acquired through conditioning. It includes the use of video presentations, testing, and short quizzes. Examples of universities offering xMOOC include Harvard, MIT, and Stanford, where they offer lessons in a combination of pre-recorded video lectures, quizzes, tests, and other forms of assessment. They focus on concise and other automated tests to check the progress of the student throughout the course, with the hope that the student will understand and he/she works through the content (Siemens, 2013).

cMOOC

These MOOCs are based on the theory of connectivism, with the learning networks developed informally. This theory argues that knowledge is distributed across various systems of connections, and the learning process involves the capacity of the student to traverse and construct through these networks (Blackmon and Major, 2017).

In cMOOCs, learning is delivered through discussion forums, which allows the concerned people to share ideas, and discuss learning content, as well as hold one-on-one interactions as well as smooth back-and-forth interactions (Chen, 2017). The emphasis is on connected and collaborative learning, where the learning takes place, as well as other platforms such as blogs, learning communities, and social media platforms.

2.2.6 Impact of Digital Disruption in the Education Sector

The application of digital technologies is rapidly changing the commercial industry. Digital technologies such as the Internet of Things, Blockchain, Data Analytics, Big Data, among others, are revolutionizing almost all the sectors of the economy in a manner that

companies and organizations can no longer be complacent. They have two basic options, either they seize the opportunity or see their business disappear. In the education sector, this disruption is inevitable (Selwyn, 2013). The industry is being forced by the digital evolution to capitalize on the innovative platforms and solutions, which are continually streaming into the market. There are various challenges and benefits faced by the education sector as a result of this digital disruption.

Benefits of Digital Disruption in the Education Sector

Virtual Teaching: according to Thomas (2017), digitally savvy students, especially those in higher education, want to learn in a way that makes sense to them. They want their educational activities to be more flexible, personalized, as the ability to learn whenever they are. Therefore, this offers the education system an advancement aspect to advance their mode of delivering learning to students through online teaching such as MOOCs. This technology has been considered to improve the students' understanding and information retention.

Personalized Learning: Through digital technology, educational institutions are able to offer personalized learning to their students. Technology has made it possible for education to be delivered based on the students' preferences in terms of school choice, whether private, public, charter, or virtual, and options of how the student will learn. An example is blended learning, which gives more responsibility to the students (Laurillard, 2016).

Artificial Intelligence (AI): This involves the application of AI to create education systems to enhance educational delivery to students. For instance, the Deakin University of Australia applied the IBM Watson and an AI-enabled technology to develop a virtual student advisory service, which was available 24/7 to the students (Jung & Lee, 2018). AI could be used to enhance the education system through personalized learning, an intelligent tutoring system, and curriculum and content evaluation.

Challenges of Digital Disruption in the Education Sector

Reluctance to technology adoption: Inferring from Brabazon (2017), the major challenge faced by the education system is that most of the institutions are reluctant to

adopt the technology due to resistance to change. The digital disruption requires reorganization of the whole education system in an institution, which implies the implementation of significant changes that may not be welcomed by some stakeholders.

Talent Gap: Knowledge and Skills are at the core of innovation. In most institutions such as universities and colleges, lack of resources or expertise has emerged as the most significant challenge hindering their digital transformation. There is a need for educational institutions to compete for scarce resources, from user experience to the secure cloud.

Legacy Integration: in various educational organizations, the existing legacy is crucial to their form of operations. Centrally, the modern web-based technological advancement does not guarantee their compatibility with the legacy systems. This is the primary point where the organizations hit the roadblock. As a result, they are forced to spend more money and investment in upgrading or custom integration (Brabazon, 2017).

2.2.7 Background and Dynamics of Thailand and Pakistan

To evaluate the use of MOOCs in each of the country, it is crucial to assess the factors that would influence its use. Considering Thailand, it is a developing economy and the second-largest economy in Southeast Asia. It has been ranked as the 17th largest global manufacturer in the world. Considering the statistics for the year 2019, the country reported a growth rate of 4.1%, an unemployment rate of 0.7%, and an inflation rate of 1.1%. The country has about 68 million people, half of who live in urban areas and cities. The literacy level in Thailand is 92.9%, which implies the proportion of the population above 15 years who can read and write (Heritage, 2020).

Pakistan is a developing country, which is entirely populated with a population of 201 million people. According to the 2019 statistics, the GDP of the country was 1.1 trillion dollars, recording economic growth of 5.2% in the same year (Heritage, 2020). It also reported a 4.3%-year compound annual growth and 5.358 dollars per capita income. In comparison to Thailand, Pakistan seems to be doing well economically. However, it has a high level of unemployment of 3.0% and an inflation rate of 3.9% (Heritage, 2020). The literacy level of Pakistan is low, at 57.9%, indicating the proportion of the population aged 15 years and above who can read and write. Compared to Thailand, Pakistan's education

system is lagging, which is also supported by the fact that the country has not established a formal MOOC platform.

2.2.8 Average Level of Student Education in Pakistan and Thailand

Education levels are a critical determinant of the progress and development of the education sector in terms of technology adoption and implementation, including the MOOCs. Considering Thailand, the government has invested heavily in education. Currently, the government of Thailand has a universal education system, which guarantees education to all Thai children under the 1999 Education Act (The World Bank, n.d). As a result, access to education has increased consistently over the two decades. The net enrollment rate for pre-primary schools for the year 2017 was 53%, the net enrollment for primary schools was 98%. The primary school completion rate in Thailand for 2017 was 93%, which is recommended, as compared to its enrollment rate. The net enrollment for secondary school is 77% (The World Bank, n.d). The government expenditure on education as a percentage of total government expenditure was 19.1%, while as a percentage, GDP was 4.1%, which is relatively high (The World Bank, n.d).

Considering the education system in Pakistan, it faces a significant challenge of ensuring that its children, particularly those from disadvantaged communities, have access to education. Though the enrollment rates have been improving, they are still low (UNICEF, n.d). Pakistan is considered as the world's second-highest, in numbers out of school children, where approximately 22.8 million students who are within the age of 5-16 do not go to school. This is about 44% of the children between this age (UNICEF, n.d). The number out of school children shoots to 11.4 million for the adolescent who is aged between 10-14 years of age. The net enrollment to primary school in Pakistan has been ranked at 77.78% for the year 2016. The education system in Pakistan has around 317,323 institutions, which accommodate approximately 50,292,570 students and 1,836,584 teachers. Considering the school enrolments by gender, 56% are male, 44% are female students, 39% are male teachers, and 61% are female teachers. For the year 2018, the net enrollment rate for pre-primary in Pakistan was 66%, while net enrollment for primary school was 68%. The prime completion rate was 71%, while the net enrollment rate in the secondary was 39%. The adult literacy rate for 15+ years was 57%

2.2.9 Technology-Acceptance in Thailand and Pakistan

With the advancement in technology evolution in the education sector, its adoption and implementation are significant aspects. In Thailand, the government has played a crucial role in technology adoption by endorsing an information technology policy framework, which is entitled “Thailand Vision towards a Knowledge-Based Economy. This technology is geared towards incorporating technology in the government systems to facilitate social and economic development. In terms of technology adoption in Thailand, technology is playing a critical role in transforming the education sector. According to Buasuwan, (2018), the technology has inherent power to accelerate the learning of the students, and when more emphasis is put on the improvement of the relationship between students and teachers, as well as the techniques of content delivery to the students, game-changing results can be achieved. The government has decided to invest in Thai Edtech, which is a program that focuses on revolutionizing the education system, make it modern, and, more importantly, allow a more effective and efficient way to reach out to Thai students. This increases the level of technology adoption in the education sector, as well as ensures that the education system is working towards improving education quality (Buasuwan, 2018).

In Pakistan, the use of information and communication technologies in the education system, particularly in higher education, has been considered by various stakeholders as an important strategy. Technology is currently considered in the country as a powerful tool for enhancing the education settings and delivery of knowledge across all divides. However, Thorpe (2009) notes that the country faces a challenge of a huge population and inadequate funds to advance the initiative. An increasing reliance on technology implies a modification of the interactions between teachers and students. Modern technology is considered to enhance content delivery in the classroom. Due to the low level of economic development of Pakistan, the level of technology adoption is quite low in the country (Sohail, Mahmood, Ali, Rafi, 2012). As the country work towards enhancing technology adoption in the education sector, it should first improve the education system by ensuring universal education to all children. However, it is critical to note that information technology has played a vital role in Pakistan’s education sector since the 1990s. The widespread of technology has enhanced the education sector in terms of

widening education access and studying flexibility as well as extending the grasp of the education sector. There is a tendency to move learning programs online by many universities, where the students can access the lectures and tutorials on their own time. Anyone who has a computer and the will to learn can study for a degree and/or a career change (Thorpe, 2009).

2.2.10 Business Models of MOOCs

The modern MOOCs have experienced continuous growth worldwide. The increase is summarized in figure 1.1 below.

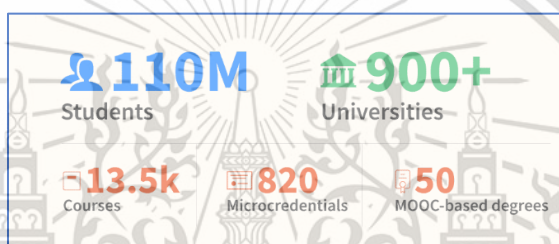


Figure 2.2. Growth of MOOCs by numbers

Source: Class central (2019)

The figure above shows that by the end of 2019, the worldwide students registered in MOOCs courses have reached 110 million in more than 900 universities. The courses had reached a peak of 13,500, 820 micro-credentials, and more than 50 MOOC-based degrees.

There is no standard model under which the MOOCs should operate. While some MOOCs are for-profit and offer their courses a fee, others are non-profit and offer their courses for free. Venture capital and philanthropy have provided funding to MOOCs platforms such as Coursera and edX. The current institutions offering MOOC platforms share their costs and split any generated revenue (Armellini & Padilla Rodriguez, 2016). Figure 1.1 below shows the growth of MOOCs over time (2012-2019) in terms of the number of courses.

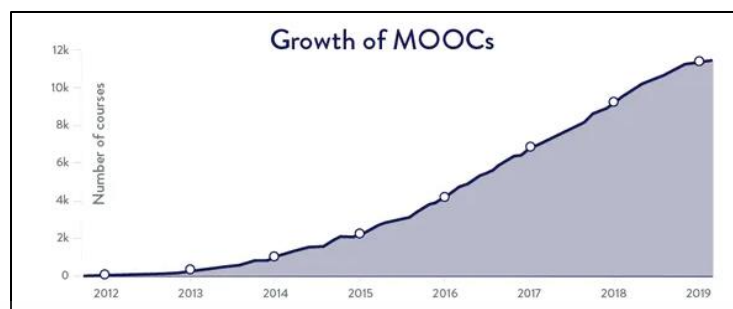


Figure 2.3. Growth of MOOCs over time (2012-2019)

Source: Edsurge (2019)

There are several revenue opportunities, which include: data mining that involves selling information regarding students to potential employers and advertisers; tuition model where students pay a course credit to the originating institution; the licensing model where the MOOC platform sells the course, part of the course or license a particular institution to sell the course (Laurillard, 2016). There are also MOOCs platforms that operate for profit. Figure 1.2 below shows the list of top five MOOCs providers by registered users.

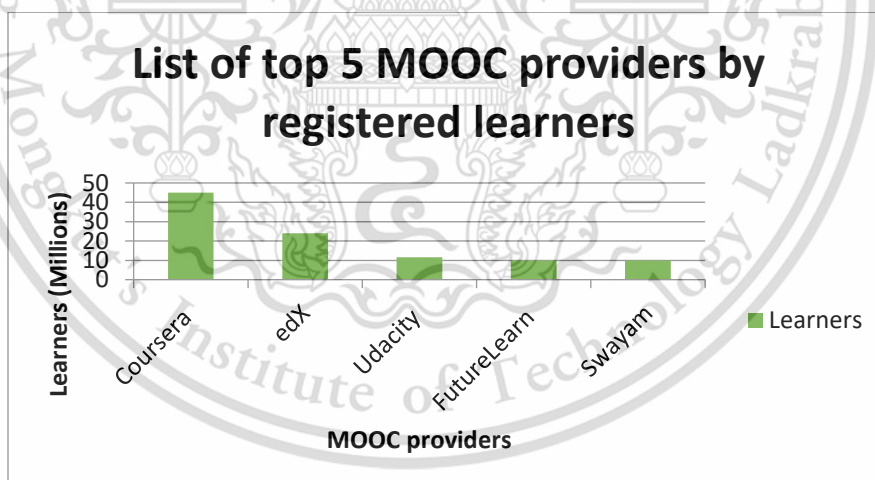


Figure 2.4. List of the top five MOOC providers by registered users

Source: Classcentral (2019)

Another important aspect to consider is the distribution of courses across subjects. As shown in figure 2.4 below, approximately 40% of the courses belong to the subjects of technology and business, which are easy to monetize (Classcentral (2019).

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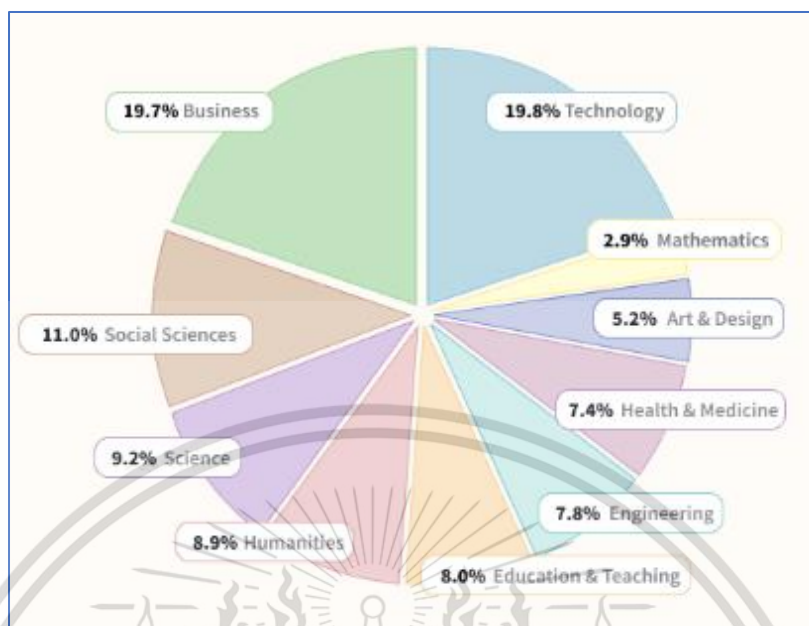


Figure 2.5. Distribution of Courses across subjects

Source: Classcentral (2019)

The following section discusses the model of some of the famous MOOC platforms and their model of operations.

Coursera

Coursera is a MOOC platform, which currently has more than 197 courses within 18 subjects. These subjects include medicine, mathematics, social science, education, computer science, among others. It is in partnership with several universities, which offer their courses on the platform. These universities include Stanford and Princeton University, as well as the Universities of Michigan and Pennsylvania (Zheng, Rosson, Shih & Carroll, 2015).

edX

edX is a non-profit organization that runs MOOCs, which was founded by Harvard University and MIT in the year 2012. It is currently the second-largest MOOC provider worldwide, serving more than 18 million students. The platform offers more than 2,200 courses spread across 139 university partners. In addition to courses, it offers different types of certificate programs, including extended MicroMasters, XSeries, Professional

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Certificates, and other Professional Education. edX offers various online degree programs, which, when completed, students are considered to have graduated.

Udacity

For instance, Udacity, is worth \$21.1 million investment from the investor companies, including Charles River Ventures and Andreessen Horowitz. Currently, the platform offers 18 courses, which are in four major categories, computer science, mathematics, programming, entrepreneurship, and general science. Udacity is considered the first MOOC platform to it the unicorn status. In partnership with other technology companies, it develops courses that Nanodegrees which focus on teaching the students the skills related to technology-related jobs. Considering that Udacity is a for-profit organization, the Nanodegrees go for around \$1000, which would take several months for a student to complete.

Udemy

Udemy is an online MOOC platform established in 2010. It allows any individual to teach and learn from online course videos. The platform offers approximately 5000 courses, among which 1,500 require the student to pay, ranging from \$200 to \$2000. The business model of Udemy is designed as a marketplace in which the tutors and students interact. Tutors or experts can create their courses and monetize them using the platform. The platform benefits by taking the commission of the sales from the experts or tutors. Therefore, Udemy is developed for the people or experts who are willing to build courses and then sell them through the platform.

XuetangX

XuetangX is the first and the biggest MOOC platform in China. The platform was established in the year 2013, by the Tsinghua University. The platform was established under the support and supervision of the China Ministry of Education and Research. It is currently considered to be the fastest MOOCs worldwide. By the end of the year 2018, the platform has increased its users to the tune of 14 million registered users. Due to its highly customized platform offers more customized services such as a cloud learning management system (LMS), which is applied by various universities across the Republic of China.

P2Pu

Another platform P2Pu was established in 2009 and focused on offering MOOCs features. It provides a great opportunity for any person to teach as well as learn online. It offers more than 50 courses (Margaryan, Bianco & Littlejohn, 2015).

2.2.11 Student enrolment and completion of MOOCs

Students across the world are showing interest in MOOC (Barak, Watted, & Haick, 2016; Jung & Lee, 2015; García-Morales, Martín-Rojas, & Garde-Sánchez, 2019). Potential attractions that MOOC offers to the full-time students or working employees; are free of cost learning, no prerequisite educational background, and no time and space-bound lectures (Barak et al., 2016). These free courses are accessed on desktop, laptop, or mobile while using the internet. This novel phenomenon in education is typically offered to adults and lasts for six months usually. The program may or may not attract large enrollment and is offered through video lectures with potential written script besides the video lectures (Bozkurt, Keskin & de Waard, 2016). The learning content is generally free, while assessment and credentials awards are done with the payment.

There are several MOOC providers, and the very prominent are Coursera and edX. Universities also, in their capacities, are taking similar initiatives. In Pakistan, two such prominent universities are the Virtual Campus of the Comsats Institute of Information Technology (CIIT) and Virtual University. Similarly, the AsianUX Academy of the Asian University, Thailand, operates on a similar eLearning model. While MOOC has widely been accepted as a resource that can supply quality content to many students, it still carries weaknesses. Lack of interaction between the teacher and students, along with the questions that arise over the students assessment of written works and authenticity of certification, are among the prominent weaknesses (Welsh & Draugsin, 2013). Still, students are favoring MOOC over class-based teaching practices due to individual gains for them (Barak et al., 2016).

The concept appeared in the limelight when Stanford University in 2011 attracted approximately 160,000 candidates for their Artificial Intelligence course (Waldrop, 2013). Though there have remained some contradictory opinions regarding the impact of MOOC on traditional learning facilities, its enrollment has risen enormously over the period

(Bozkurt, Keskin & de Waard, 2016). Class Central, a leading campaigner for MOOC, has reported the number of enrollments to be around 110 million worldwide, and the most opted disciplines are Technology 19.8% and business 19.7% (Shah, 2019).

The growing trend of MOOC adoption has enticed enormous scholarly work which attempts to explore it from varying perspectives including enrollment and drop out ratio (Ho et al., 2015), social engagement (Ferguson & Clow, 2015), and motivation to register online course (Barak et al., 2016). As the concept is still novel, the issues remain still in abundance. The problem this study will encounter is explained in the proceeding section.

2.3 The design of MOOCs

The design of MOOCs is broadly classified into three major categories, cMOOCs, tMOOCs, and xMOOCs. The cMOOC refers to network-based MOOCs, which focuses on connecting the learners to a community of learning environment. Siemens and Dowens developed the first cMOOC in the year 2008 (McAuley, Stewart, Siemans, & Cormier, 2011). tMOOCs are task-based MOOCs, which offer specific tasks to the learner to complete them, with the support of community and content. The last model of MOOCs is xMOOCs, which are typically content-based. Universities usually offer xMOOCs in conjunction with other external firms, such as Udacity or edX. Compared to the cMOOC, the xMOOC, which has recently grown in popularity, does not provide a good connection between students and educators (Adamopoulos, 2013).

According to Conole (2014), the design of MOOCs is also addressed from the perspective of the learning design, just like any other course, whether teaching in an online one or face-to-face environment. Learning design implies a research field responsible for providing tools and techniques, which could be applied in the articulation and representation of the design process of the learning process. This makes the courses more articulate and sharable and helps educators in organizing and planning their education tutorials and events more effectively. MOOCs are a complex learning context, which applies the learning design, which is essential in bringing together various stakeholders and resources.

2.3.1 MOOC Adoption and Implementation

MOOCs are considered an innovation in the education delivery system. The adoption and implementation by both institutions and students depend on their effectiveness and ease of use. Some of the factors, which determine the participation of learners on the MOOCs, could be understood from the perspective of Bouchard's (2009) four dimensions affecting active, self-directed learning behavior. The first dimension is **conative**, which implies all the possible reasons that drive a person to engage in learning, such as drive, motivation, confidence, and initiative. The second dimension is **algorithmic**, which implies the pedagogical issues, which include pace goal setting in learning, sequencing, and evaluation of the learning progress. The third dimension is the **semiotics of learning**, which refers to the various ways of content delivery in an e-learning environment, which includes hypertext, video, audio, 2D, and 3D images. The last dimension is the **economy**, which implies the forms the courses are available to the learners, such as credit, non-credit, chat groups, different languages, different countries, and numerous sources, which affect the learners in terms of costs and future employments. According to (Daniel, 2012; Martin, 2012) on the adoption of MOOCs, the emerging studies indicate that on-campus students who are taking MOOC attend fewer classes, which usually have or interaction time between the students and their lecturers, as well as among the students. Martin (2012) questioned the applicability of MOOCs on a large scale with consideration of online students, as it is characterized by the aspect that 'the weaker student struggled, and a few strong students were bored'.

The researcher noted that in the long-run, there is a possibility of MOOCs to unbundle the capabilities and resources of the universities, such as class presentations, student accommodations, student services, and cafeterias (Anderson & McGreal, 2012). As far as MOOCs integration is concerned, appropriate assessment measures are recommended (Koutropoulos et al., 2012).

2.3.2 Issues associated with MOOCs

The attention regarding overemphasis around MOOCs did raise a lot of concerns and criticisms altogether in education. This part does investigate the issues regarding the sustainability type of business models, pedagogical issues, and quality and completion rates

awarding credit to MOOCs. According to McCue (2018), the entire global e-learning market was estimated to reach \$107 billion by the year 2015. Relatively, it is not clear yet, how the MOOCs did approach online education as entitled to make money. Most of the MOOCs startups do not need to appear and have the business type models, to enhance the follow-ups of the most common approach regarding worrying revenue streams.

The notable and conventional approaches that aid in revenue generation, as considered by Coursera, as providers of premium services that link employers with students that have a certain ability in each area (Singh & Nagwade, 2018). However, it tends to become a significant challenge for the partnering universities to be able to generate some income in these ways within established business models, having specific prepositions in that they provide special recognition of education. On MOOCs, the most regarded and participating institutions, they that saw it's good not to offer credits as a traditional for the courses regarding the quality of the courses downside risks posed concerning their branding (Agasisti, Azzone & Soncin, 2018). However, it has been widely seen universities happen to charge the course fees regarding their MOOCs as a branding mechanism and marketing strategy which is against the norm of MOOCs to charge any fees.

Pedagogy

The significant concerns regarding MOOCs; are (1) do MOOCs follow a sound pedagogy and an organizational approach towards online learning, where they lead towards the quality outcomes and experiences on students? (2) The type of pedagogy and the organizational mechanisms might be required if MOOCs deliver a high kind of learning experience? Despite MOOCs having been much criticized for the adoption of knowledge transition type models, in essence, they have been considered being traditionally enriched towards teacher-centered instructions (Brigui-Chtioui & Caillou, 2017). Larry (2012) indicated how such type of systems does offer individualized experience, such that, they do allow the students to look for an alternative route such that through learning materials and in return, offer an automated response.

Additionally, some institutions do not have enough tutors who have the capacity for online knowledge concerning the developments of the intended courses. Relatively, MOOCs do enhance the provision of opportunities for the nontraditional forms of

knowledge regarding teaching approaches where learners can assist each other and acquire know-how from one another (Singh & Nagwade, 2018). Additionally, the online communities do crowd answers to problems where they create a network that shares the learning, thus distributing it in ways that bring about seldom occurrence in the traditional learning centers. This encourages excellent exploitation type of peer support through the usage of peer-related assessment techniques (Lim & Goh, 2016).

Quality and completion rates

The most formidable concern within MOOCs is quality assurance, where in most cases, they do lack structure, where mostly they do not include the instructor or the teacher role. They are extensively and self-directed related learning, which does have a significant difference regarding experience as compared to formal education. The above mode of learning does create a population that is self-selected to be engaged and is passionate enough towards this mode of learning (Wang, Hall & Wang, 2019). MOOCs, on the other hand, also demand a high level of literacy from the participants, which initially raised concerns about inclusivity and equal access. Relatively, there tend to have very little quality assurance in the above mode of learning since there is no adequate and dependable evaluation that is carried out.

Due to the above, the courses from the individual and institution rates poorly; thus, individual rates disappear, or demand deteriorates due to poor ratings. Since the form of quality assurance with enhancement majorly comes from reflections and the formal valuations from enthusiastic who float the courses from entire participants by the use of social media, which increases the dropouts' rates and progression, making MOOCs a contested debate (Chang & Wei, 2016).

Assessment and credit

The most notable instrument the MOOCs uses is quizzes, where they are multiple short questions with automated related answers for the feedback. They depend on open response assessments, whereas, within the limited resources, it might be hard for those assessments to be marked by one lecturer since they mostly rely on peer engagement to aid in the student learning process.

Coursera, for example, entails the submission of the essay type of answers within which they have been graded through an assessment to enhance balancing of scale with the readily available resources. Additionally, there have been several concerns about cheating and plagiarism with online learning, mostly where the related courses are eligible for credits. MOOCs often do allow participants to earn badges and certificates after completion, thus making credits towards the degree qualification.

2.3.3 MOOCs Potters 5 Forces

Potters (1985, 2008) Five Forces model supports a strategic analysis within which interactions that underlie between organizations and structures that do frame their initial success and positions of that particular structure. The frame strategizes the analysis of the structure of any of the domains by use of anonymous five forces (Lim & Goh, 2016). While complementing the above forces, some factors ought to be considered, like the industry growth, technology, innovation, and relationship with related sectors, which includes employers.

The threat of a substitute

Substitutes do offer some attractive prices performance within which is easier to switch from an already established product. MOOCs are free, though they do have substantial opportunity costs, where if the student will engage seriously with their courses enables collaboration and the interaction facility actively, thus being easy to enroll and commence the study. Besides, the substitution can be clearly seen in terms of Christensen's models of the new markets and a low-end disruptive innovation (Yuan & Powell, 2013). He continued to indicate how MOOCs are a clear type of low-end disruption, whereas the values which do support formal education, thus resulting in high-quality education, eventually discarded, therefore, focus playing strictly on learning. The barrier that entails the MOOC substitution includes a utility performance within potter's terminology performance of an education certificate or either qualification with an influence of certain perception that the free goods do not have value.

The threat of new entrants

Any new entrance in regard to potter's second force brings about different capabilities being energized with a view of competing with new entrants. They mostly capitalize on the success of other established organizations to access the opportunities and resources unavailable in the market. The new entrants might not be better positioned both financially and psychologically, thus posing an entry barrier as a fundamental weakness on societal market acceptance.

Bargaining Power of buyers

Potters described the bargaining power of buyers as a force that does superficially describe the reflection on influence and an impact on any of the desperate group of significant stakeholders. Most MOOCs students do depend on the system to enhance the delivery of personal benefits, thus making substantial personal income and investments within the system (Singh & Nagwade, 2018). Beyond fees, students do engage in the system to deliver certain personal benefits, making students forego earnings towards full-time employment, being majority users of technology.

Bargaining power of suppliers

The powerful suppliers do transfer costs to an enterprise, thus retaining power and control over critical aspects of an industry. Mostly high education is unusual such that the major supplier is always the faculty who tend to be the collegial owners within the institution who tend to be the major players of the leadership of supplier institution that do controls much the academy leadership. Most notable supplier groups entail academic publishing consultants, the technology companies, namely Microsoft, Google, Moodle, and Blackboard, the vast array of companies that provides specific functions in the eLearning context (Tracey, Swart, & Murphy, 2018).

Rivalry among existing competitors

Idealistically, most of the countries, institutions owned individually do comprise the public sponsored sector in which they co-work for delivery of the value that can be possible for taxpayers. Since competitors are institutions that run as separate entities, they enhance the increase of management ideologies, which has become popular over a few

decades ago. The above management ideologies have enforced an engagement within the market competition intended to enhance stimulation efficiency within an enterprise (Sawmong, 2021; Kulchitaphong, Urbański, Chaveesuk, Chaiyasoonthorn, 2021; Razmerita, Kirchner, Hockerts & Tan, 2018; Tangthong, Trimetsoontorn, Rojniruttikul, 2015; Lonkani, Changchit, Satjawathee, 2012). Also, MOOC institutions do compete for the best reputation to attract intelligent students to their companies, thus being highly ranked internationally.

2.3.4 SWOT Analysis of MOOCs

MOOCs have prompted educational institutions to re-examine their position in terms of content delivery (Daniel, 2012). Every institution needs to have a MOOC strategy. Given such circumstances, it is essential to consider the potential benefits and threats, which would emanate from this engagement (Jansen & Schuwer, 2015). This section conducts Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis of MOOCs.

Strengths

Openness: one of the major strengths of MOOCs is that they are open to anyone who could be willing to learn. Regardless of the geographical location and time zone, any individual can access the courses offered by MOOCs platforms such as Coursera and edX, as long as they have internet and an access device such as laptop, phone, or iPad. Openness is also improved by the fact that some of the MOOCs offer their courses free, hence beneficial to millions of students worldwide (Koller, 2012).

Expertise: Most MOOCs accommodate different professionals and experts in various areas of study. Platforms such as Udemy allow tutors to register and sell their courses, whose credibility is based on the reviews of the students. Therefore, students can learn from a wide range of experts in a certain subject, hence can attain excellent skills by learning from different professionals on the same course.

Weaknesses

Adaptation: According to Kolowich (2013), most university staff face the challenge of adapting to MOOCs platforms. Most of them, with their experience in online pedagogy and instructional design, most of the university staff have not delivered their

courses on MOOCs platforms. Most of the university lecturers are accustomed to teaching small classes to well-known students as audiences.

Assessment: Through the MOOCs have increased in popularity and acceptability worldwide among students, there is a great gap in assessing the performance of the student. There does not exist an effective assessment criterion on how the students perform in their learning process on MOOCs. According to McMinn (2013), the low completion rates, which are a big challenge facing MOOCs.

Little revenue: The participants of the MOOCs are primarily composed of learners who may not be paying to access the courses taught. One characteristic of MOOCs is that they offer their courses for free. Lack of revenue from learners may hinder the effective development and implementation of MOOCs platforms. Even if the institutions may submit their courses, free of charge, or requiring monetary help from external platforms, the institutions still need to cater to the normal expenses such as maintain the platforms, university offices, and resources used in managing MOOCs (Koller, 2012).

Opportunities

Global network: The advancement in technology, internet connectivity, and globalization gives MOOCs an enhanced platform to operate and advance. These advancements have facilitated the shift of the education and associated aspects of the business model from the notion of direct lecturing of students to a more collaborative and interactive model of delivering (Meinel, Totschnig & Willems, 2013).

The Shift of pedagogy: There is a shift in teaching, specifically the academic subject and theoretical concept of delivering content. There is a shift in pedagogy from a teacher-centric design in the online education, to a cooperative and collaborative teacher-learner-centric model. This presents an opportunity for pedagogical innovations.

Research and Innovation: MOOCs present an innovative based on technology and media affordability. It offers research opportunities, which are attractive to the instructional system of researchers (Siemens, 2013). The interaction of learners and teachers through MOOCs generates a wide range of data and offers researchers an opportunity to cultivate the quasi-experimental researchers. In addition, MOOCs use

different media, which allows for personalization and individualization of the learning process to suit the needs of the learner.

Threats

Enrollment vs. Completion: The evaluation and assessment process is a significant threat to the going concern of MOOCs. The learners that enroll are different, with different intent and representations. The instructor has no way of evaluating whether the registered student is serious about taking the course or not or has the prerequisite knowledge of taking the course (Koller, 2012). In addition to the variance of students engaged in a class from hundreds to even thousands in a week, MOOCs typically experience wide variation from the numbers who enroll in the number who complete the course.

Market Saturation: In the real world, the design and delivery of MOOCs could be a great success. However, the reality could be completely different. In the MOOCs marketplace, they could be saturated over a short period of time (Daniel, 2012). In such a case, there would be a high level of content duplication and intense competition for students. At the same time, the public interest in MOOCs may fade. This could be considered as a total market failure, to the extent that there would be a building of MOOCs without students' enrollment.

2.4 Unified Theory of Acceptance and Use of Technology

With the continuous worldwide technological advancements, its user adoption and acceptance have been a management challenge (Schwarz and Chin, 2007). It has also occupied researchers in a manner that the extent of technology adoption, diffusion, and application is considered among the more mature areas of research (Venkatesh et al., 2003). As a result, there has been a broad level of exploration research in this aspect, contributing to a wide body of literature. The exploration has resulted in revealing various stakeholders' perspectives, units of analysis, theories, technology and context, and research methods (Williams et al., 2009). In this context, Venkatesh et al. (2003) developed a comprehensive model that unites various alternative models, The Unified Theory of acceptance and use of Technology (UTAUT), shown by the figure below.

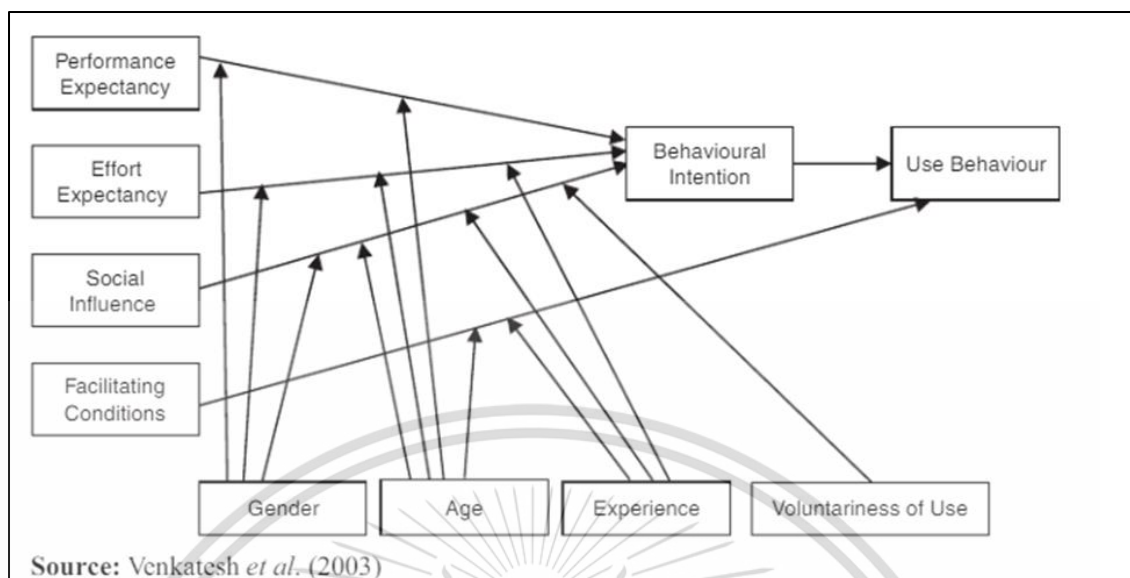


Figure 2.6. Unified Theory of acceptance and use of Technology (UTAUT) Model#

Source: Venkatesh *et al.* (2003)

According to the UTAUT model, four major constructs determine the behavioral intention and the ultimate behavior of technological system adoption and use. These constructs include performance expectancy, the effort expectancy, the social influence, and facilitating conditions. In turn, these constructs are moderated by other factors, which are age, gender, experience, and voluntariness of use (Venkatesh *et al.*, 2003). The model postulates that through an examination of these constructs, it can determine the key factors that influence technology acceptance in any given context. This theory was developed as a result of the integration of eight different models, namely: the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behavior (TPB), a combined TBP/TAM, the Model of PC Utilization, Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). These contributing theories have been widely applied in various studies of technology adoption and diffusion in multiple disciplines such as management, psychology, marketing, information system, among others. The model was developed from the results of a six-month study in four organizations, where the contributing models were found to explain between 17 and 53 percent of the variance in user intention to use technology. However, the UTAUT model was found to outperform them in its ability to predict the user's intention to use technology,

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

since it is adjusted R^2 was 69 percent (Venkatesh et al., 2003). Since its introduction, UTAUT model has been widely applied to evaluate the user intention to adopt and use technology in various sectors of the economy.

2.4.1 Application of UTAUT Model

Tseng, Lin, Wang, & Liu (2019) carried out a study on the teacher's adoption of the MOOCs using UTAUT2 model. Despite their popularity, the MOOCs could be a challenging aspect to the teachers. Therefore, it is important to understand the factors influencing the use of MOOCs among teachers. The study applied an online survey from teachers at the university of Taiwan. The study used the Partial least square equation modeling (PLS-SEM) to analyze the data. The findings of the study indicated that performance expectancy, facilitating conditions, and price value significantly influences the behavioral intention for teachers to use MOOCs. Further, the use of MOOCs is influenced by facilitating conditions and behavioral intention to use. Effort expectancy and hedonic intention did not influence the teacher's intention to use MOOC.

Govindarajan & Krishnan (2019) studies investigated the moderating effects of age, gender, and experience in the use of MOOCs by extending the UTAUT model. This was because of the high level of discontinuing students with MOOCs, despite the high levels of their enrollment. To carry out the study, 168 college students were used as a sample size. The study used statistical techniques of regression analysis and cross-tabulation using SPSS software. The findings of the study indicated that the intention to use MOOCs is influenced by performance expectancy, effort expectancy, social influence, self-efficacy, and website quality. The factors of gender and experience were found to have a very little moderating effect.

Fianu, Blewett, Ampong & Ofori (2018) investigated the factors that influence the usage of MOOCs by the students. The study was due to the widespread criticism regarding the rates of participation and enrollment in MOOCs. The study, therefore, focused on investigating the trend. The research used a total of 270 student respondents who had enrolled for a MOOC. According to the findings of the study, the intention to use MOOC is affected by performance expectancy, self-efficacy, and system quality. The study also found that the use of MOOC is influenced by facilitating conditions, MOOC usage

intention, and instructional quality. However, the constructs of effort expectancy and social influence do not influence MOOCs usage intention. The study highlighted the importance of institutions having the necessary structures and resources to support MOOCs.

Mendoza, Jung & Kobayashi (2017) carried out an empirical review of the studies carried out on MOOCs adoption by the use of UTAUT model. The study indicated that there is still significant that has not been addressed by the literature. In some teaching and learning contexts, there is a critical deficient in the investigation of the factors that influence the use of MOOCs. This has acted as a significant hindrance to the factors that influence the use of MOOCs. The study investigated a total of 40 empirical studies published between 2007 and 2016. According to the findings of the study, the most significant factor that influences the use of MOOCs was the performance expectancy. Facilitating conditions were identified as the major barrier to the intention to use MOOCs. The study also advised the use of other constructs such as learners' variables and language competencies.

De Sena Abrahão, Moriguchi & Andrade (2016) carried out a study on the intention of adoption of mobile payment using the UTAUT model. The study was motivated by the growing use of smartphones, which facilitated online transactions using mobile phones. The study evaluated the adoption of mobile payment services by Brazilian consumers. The study was carried out on telecommunication companies, using a sample of 605 respondents. The study applied the structural equation model. The results of the survey indicated that 76% of the behavioral intention to use the technology was explained by performance expectation, effort expectation, social influence, and perceived risk. However, perceived cost was found to be not statistically significant at 5% level of significance.

Liu, Miguel Cruz, Rios Rincon, Buttar, Ranson & Goertzen (2015) carried out a study to investigate the factors that determine the therapist's acceptance of new technology for rehabilitation using UTAUT model. The study target population was the occupational therapists (OT) and physical therapists (PT) who provide therapeutic services in the hospital. The partial least square technique was adopted. The study found out that performance expectancy was the strongest determinant of behavioral intention to use new technology in rehabilitation, while effort expectancy and social influence did not determine

the behavioral intention. The results also indicated that the current use of technologies in rehabilitation was influenced by behavioral intention and facilitating conditions.

Escobar-Rodríguez & Carvajal-Trujillo (2014) conducted a study on the determinants of the adoption and use of online purchasing tickets for low-cost carriers (LLC) websites. They applied an extended UTAUT model. The study applied a sample size of 1096 Spanish consumers of the LLC flights. The results indicated that the determinants of the adoption of online purchasing of LLC technology included trust, cost-saving, habit, ease of use, expended effort, performance, social factors, and hedonic motivations. The most important variables in influencing purchasing intention are the ease of use and habits.

Mulik, Srivastava & Yajnik (2012) carried out a study to examine the MOOC adoption by extending the UTAUT model. The study added the perceived value construct to the UTAUT model. The study used a study sample of 310 respondents, who had a previous enrollment in any of the MOOCs platforms such as Coursera, edX, and FutureLearn. The study applied the Partial Least Square Structural Equation Modelling (PLS-SEM) to conduct the analysis. The results showed that the factors influencing the intention to use MOOC were performance expectancy, effort expectancy, social influence, perceived value, and facilitating conditions. These variables together influenced 49% of the variation in intention to use MOOCs.

Venkatesh, Thong & Xu (2012) conducted a study on the extension of the UTAUT model to evaluate the adoption and use of technology within the context of consumers. The proposed model added three constructs to the UTAUT model to form UTAUT2 model. The added constructs were habit, hedonic motivation, and price value. The individual differences factors (age, gender, and experience) were added as moderators to this model, to evaluate the effects of these constructs on the behavioral intention to use technology. The data was collected from an online survey of 1,512 mobile internet consumers. In comparison to UTAUT model, the results of the study indicated that UTAUT2 model had significant improvements on the variances of behavioral intention between 56 and 74%, and technological use between 40 and 52 %.

2.5 Concepts and theories of Behavioral Intention to Use

Behavioral intention implies the individual's intention to perform act, which could predict a given behavior when an individual acts voluntarily (Tseng et al., 2019). It implies the subjective probability of a person conducting a certain behavior, and the cause of certain usage behavior (Yi, Jackson, Park & Probst, 2006). Therefore, intention implies the motivational factors of a person to engage in a certain behavior, and the indicator of how hard an individual could be willing to try a particular behavior, and the effort they put engage in the behavior.

Table 2.2. Definitions of behavioral intention to use

Scholar/Researcher	Definitions
Tseng et al. (2019)	Implies the individual's intention to perform act, which could predict a given behavior when an individual act voluntarily
Xiao et al. (2019)	An action that is performed based on the belief and personal sense
Islam et al. (2013)	The individual's intention to perform act, which could predict a given behavior when an individual act voluntarily
Fishbein and Ajzen (2010)	The readiness or possibility of a person to express any behavior
Marchewka, Liu and Kostiwa, (2007); Venkatesh et al. (2003)	User's intention to use the technology
Yi, Jackson, Park & Probst (2006)	The subjective probability of a person conducting in a certain behavior, and the cause of certain usage behavior

Table 2.2 presented researchers' definitions of behavioral intention to use. This study has concluded that intention to use implies the readiness or willingness of a person to take action to use the MOOCs technology in learning.

In the context of technology adoption, the relationship between all individuals and their use of technology is governed by the behavioral intention, which is defined as the strength of an individual's desire to perform a certain act. (Venkatesh & Bala, 2008; Venkatesh et al., 2003; Davis et al., 1989; Fishbein & Ajzen, 1975). It is important to note that the initial framework for technology acceptance and use is based on the classical behavioral theories. Examples include the Theory of Reasoned Action, the Theory of Planned Behavior, among others. However, research efforts that have been made utilizing these theories and associated models are dominated by the information technology perspective. The main goal of these researchers is to understand the behavioral intention to use technological systems to assist in the technology development process, adoption, and application in various aspects of life.

Table 2.3. Literature on Behavioral Intention to use

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Yeop, Yaakob, Wong, Don, and Zain (2019)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education
Tseng, Lin, Wang, and Liu (2019)	Behavioral Intention to Use	- Intention to use - Planning to use	Education (MOOCs)
Chan et al. (2018)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education (MOOCs)
Joo, So and Kim (2018)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education (MOOCs)
Tan and Lau (2016)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education (MOOCs)

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Gao and Yang (2015)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education (MOOCs)
Khechine, Lakhal, Pascot and Bytha (2014)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education
Sawsen Lakhal, Hager Khechine, Daniel Pascot (2013)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education
Juinn and Tan (2013)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education
Park, Nam, and Cha (2012)	Behavioral Intention to Use	- Intention to use - Predicting to use - Planning to use	Education (m-learning)

Table 2.3 presents a summary of the literature review on the behavioral intention to use. Based on the literature, the observed variables of behavioral intention to use include 1) intention to use technology, 2) prediction of using, 3) planning to use

The relationship between the behavioral intention to use technology and the actual use of technology has led to the development of several models. The models focus on evaluating the factors that capture the effect of behavioral intention and consider it to be a better predictor of the actual behavior. In addition to UTAUT model, other models serving the same purpose is the Technology Acceptance Model (TAM) and TAM2, a revision of the TAM model. The models share several features due to the commonalities of their origin. The models were adapted from the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (TPB) (Ajzen, 1985, 1991). The specific aspect is that behavioral intention to use technology serves as the only predictor of use across all these models.

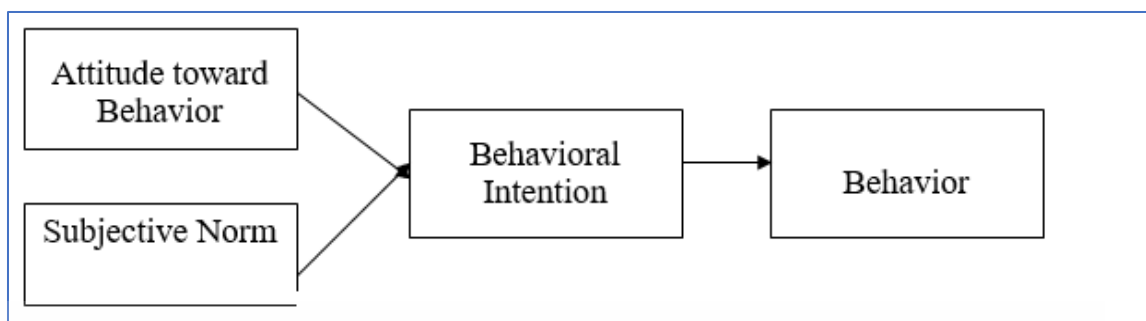


Figure 2.7. Theory of Reasoned Action

Source: Fishbein & Ajzen (1975)

From a theoretical perspective, TRA theory provides an explanation of the behavior of an individual, where he or she possesses complete volitional control. Besides, the TPB theory presents the TRA theory by allowing the prediction of an individual's behavioral intention where he/she has incomplete volitional control. According to the summary of behavioral intention given by Ajzen (1991), behavioral intention can find expression in behavior only if the behavior in question is under volitional control.

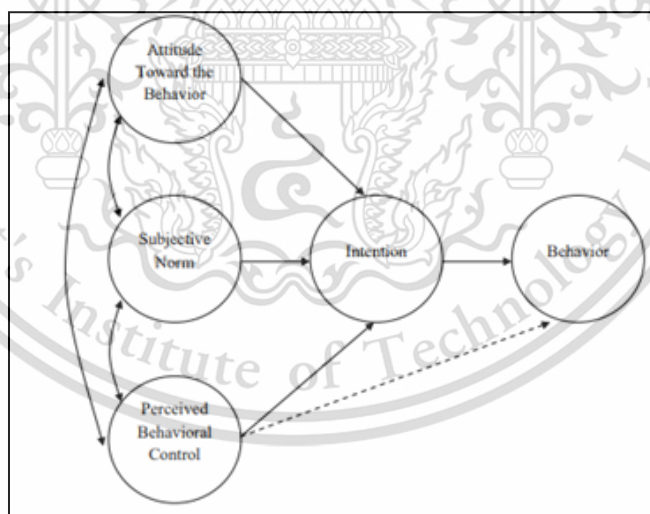


Figure 2.8. Theory of Planned Behavior

Source: Ajzen (1991)

In both the TRA and TPB theory, the intentional behavior to use technology plays a critical role. This is because all the predictors of the behavior indirectly influence the

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behavior through their direct effect on behavioral intention. The theories argue that behavioral intention is formed through the mental deliberation process, which involves the evaluation of the salient beliefs which are related to the behavior and formation of attitudes (Ajzen, 1985, 1991; Fishbein & Ajzen, 1975). The behavioral intention of an individual, according to Fishbein and Ajzen (1975), is based on their pre-existing attitude and behavioral intentions. These beliefs and the associated behavioral evaluation are the ones that determine whether an individual intends to perform a behavior. In the context of technology acceptance, if technology, the behavior intention could be considered as the most proximal origins of the concerning behavior. The behavioral intention, in turn, is influenced by the beliefs of the behavior in question, hence the need to investigate the factors influencing the beliefs to improve the use of technology.

Based on the literature, theories, concepts, and researchers' findings of the behavioral intention to use, the latent variable behavior intention to use is comprised of three observed variables, as shown in figure 2.4

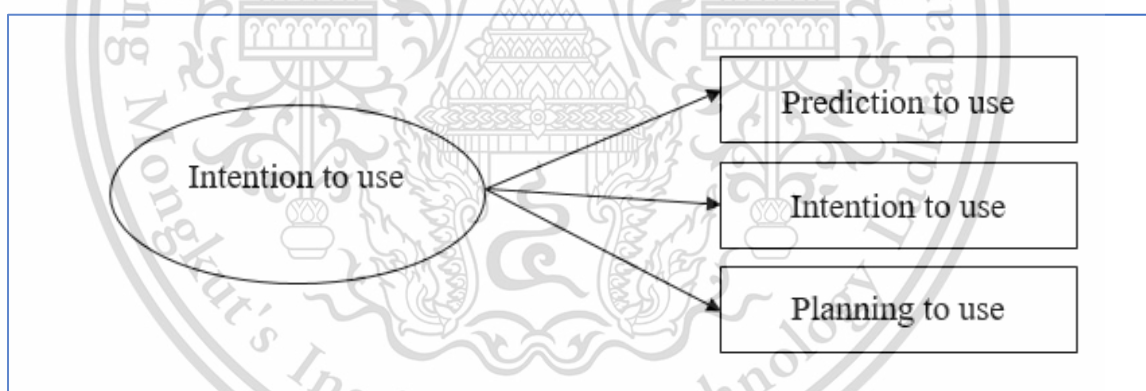


Figure 2.9. Model for Intention to use

2.6 Concepts and Theories of Performance Expectancy

Performance Expectancy (PE) implies the degree to which an individual believes that using a system could be helpful to do better in job performance (Venkatesh et al., 2003). The term performance expectancy emerged from a combination of five different factors developed from five different models. These include the perceived usefulness (technology acceptance model), external motivation (motivational model), job fit (personal

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computer utilization model), relative advantage (innovation diffusion theory) as well as outcome expectancy (social cognitive theory) (Venkatesh & Davis, 2000).

Table 2.4. Definitions of Performance Expectancy

Scholar/Researcher	Definitions
Venkatesh et al. (2003)	Implies the degree to which an individual believes that using a system could be helpful to do better in job performance
Zhenghao, Alcorn, Christensen, Eriksson, Koller, and Emanuel (2015)	The individual's perception of the potential of a particular technology to perform different activities
Venkatesh <i>et al.</i> , (2012); Zhou <i>et al.</i> , (2010)	Utilities extracted by using services such as saving time, money, and effort, the convenience of payment, fast response, and service effectiveness
Marchewka, Liu and Kostiwa (2007)	User's expectations of the technology in assisting them to increase their work performance

Table 2.4 presents the definition of performance expectancy from various researches. The research concluded that performance expectancy implies the expectations of the user that using MOOCs platforms for learning would improve the academic performance in terms of understanding, grades, and job

According to Gupta and Dogra (2017), the concept of performance expectancy is to be viewed as an improvement in performance that an individual believes can be achieved using technology.

Table 2.5. Literature on Performance Expectancy

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Gupta and Dogra (2017)	Performance expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Tourism
Zainol Yahaya, Yahaya, and Zain (2017)	Performance expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Education (Mobile learning)
Tan and Lau (2016)	Performance expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Education
Cheok and Wong (2015)	Performance expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Education
Sung, Jeong, Jeong, and Shin (2015)	Performance expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Education (Mobile Learning)
Nordin, Norman, and Embi (2015)	Performance expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Education (MOOCs)
Sawsen Lakhali, Hager Khechine, and Daniel Pascot (2013)	Performance Expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Education
Juinn and Tan (2013)	Performance Expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Education
Rahman, Jamaludin and Mahmud (2011)	Performance Expectancy	- Perceived usefulness - Relative advantage - Outcome expectation	Education

Table 2.5 presents the literature, theories, and concept of the performance expectancy. From the literature, the study the performance expectancy constructs have 3

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observed variables, which include 1) perceived usefulness, 2) relative advantage, and 3) outcome expectation

Zainol Yahaya, Yahaya, and Zain (2017) carried out an investigation of the factors that influenced the use of mobile learning among higher education students in Malaysia. According to the study, mobile learning entailed the use of ICT in learning and teaching. The study used a sample size of 150 accounting students in Malaysian institutions of higher education. The researchers collected data using a questionnaire, which was developed from the original UTAUT scale, developed by Venkatesh et al. (2003). According to the findings of the study, there were positive relationship between performance expectancy and the rate of acceptance of the learning, where the coefficient of correlation was significant at $r=0.226$. Effort expectancy and facilitating conditions also had a substantial relationship with the acceptance of mobile learning.

Cheok and Wong (2015) investigated the aspect of performance expectancy or perceived usefulness by analyzing the predictors of e-learning satisfaction, in secondary school teachers teaching and learning in Malaysia. The authors have also discussed potential determinants of satisfaction among teachers included User-related characteristics, organizational-related characteristics, and e-learning-system characteristics. The approach applied to locate and identify materials used in the study was Webster and Watson. The study materials were gathered with the aid of databases such as Cambridge University Press, EBSCO Host, Science Direct, ProQuest, Springer, Sage, and Spring Online. The research found out that three teachers' characteristics (self-efficacy, attitude, and anxiety) determine whether the system is effectively adopted or not. To change the teachers' pedagogical practices, the study indicates that teachers need to be supported. Therefore, the study recommended the adoption of organizational support, such as management, training, technical, and helping teachers in adopting new technology.

From the literature, concepts, theories, and researchers conducted on the performance expectancy, the following model was obtained for the performance expectancy, which comprised three observed variables.

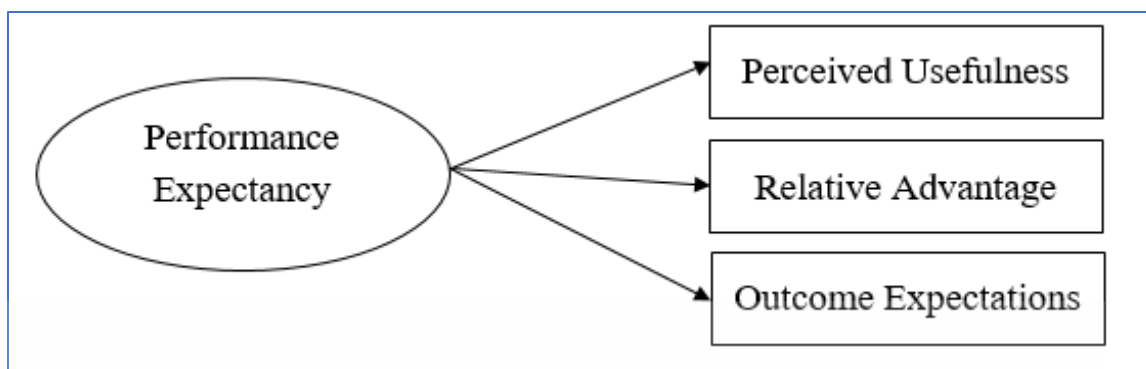


Figure 2.10. Performance Expectancy Model

2.7 Concepts and Theories of Effort Expectancy

According to Venkatesh et al. (2003), effort expectancy implies the degree of ease associated with using a particular technological system. This concept is developed by merging three concepts, the perceived ease of use, complexity, and ease of use.

Table 2.6. Definitions of Effort Expectancy

Scholar/Researcher	Definitions
Venkatesh et al. (2003)	Implies the degree of ease that is associated with the use of a particular technological system
Zhenghao, Alcorn, Christensen, Eriksson, Koller and Emanuel (2015)	The level of ease related to the use of technology
Marchewka, Liu and Kostiwa (2007)	Technology's ease of use

Table 2.6 presents the various researchers' definitions of the effort expectancy. This study indicates that effort expectancy implies the ease of use of MOOCs platforms technology in learning courses available on this platform.

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The concept of perceived ease of use is derived from the Technology Acceptance Model (TAM) (Davis, 1986), which implies the effortlessness of using technology. The second concept, complexity, is related to the effort expectations, which was derived from the Model of PC Utilization (MPCU) (Thompson et al., 1991). The last concept, ease of use, is one of the constructs making Innovation Diffusion Theory (IDT) (Rogers, 1995), which implies the complexity in the use of a system. According to Venkatesh et al. (2003), the concept of complexity is related to the aspect of the general system, while the ease of use is related to innovation.

Several studies have investigated the relationship between effort expectancy and behavioral intention to use.

Sawsen Lakhali, Hager Khechine, Daniel Pascot (2013) investigated the behavioral intention of the students to use desktop video as in a distance course by analyzing the impact of effort expectancy as construct of UTAUT model. The UTAUT model was extended to include additional variables of video conferencing general social influence, peer social influence and autonomy. The data was collected from a total of 177 business students who had to distance learning. The study found that the factors that influenced the behavioral decision to use included performance expectancy, facilitating conditions, general social influence.

Table 2.7. Literature review on Effort Expectancy

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Tan and Lau (2016)	Effort Expectancy	- Perceived Ease of Use - Ease of Use	Education (mobile learning)
Nordin, Norman and Embi (2015)	Effort Expectancy	- Perceived Ease of Use - Ease of Use	Education (MOOCs)
Sung, Jeong, Jeong, and Shin (2015)	Effort Expectancy	- Perceived Ease of Use - Ease of Use	Education (mobile learning)
Sawsen Lakhhal, Hager Khechine, and Daniel Pascot (2013)	Effort Expectancy	- Perceived Ease of Use - Ease of Use	Education
Juinn & Tan (2013)	Effort Expectancy	- Perceived Ease of Use - Ease of Use	Education
Thomas, Singh, and Gaffar (2013)	Effort Expectancy	- Perceived Ease of Use - Ease of Use	Education
Phichitchaisopa and Naenna (2013)	Effort Expectancy	- Perceived Ease of Use - Ease of Use	Health

Table 2.7 presents the literature, concepts, theories, and research done by researchers on the effort expectancy. This study observed that the effort expectancy construct is made up of 2 observed variables 1) perceived ease of use 2) ease of use, as discussed in the following sections.

Nordin, Norman & Embi, (2015) investigated the technology acceptance of massive open online courses in Malaysia. The data for the study was collected from the online survey, from a total of 1,055 students who had registered for MOOCs course. The research applied the UTAUT model with various variables of performance expectancy, effort expectancy, social influence, facilitating conditions, behavioral intention, and other factors of attitude, anxiety, and self-efficacy. The study indicated that the four constructs

of UTAUT model influenced behavioral intention to use MOOCs. Another variable that has a positive effect on the intention to use was anxiety.

From the literature, concepts, theories, and researchers conducted on the effort expectancy, the following model was obtained for the effort expectancy, which comprised two observed variables, as in figure 2.11 below.

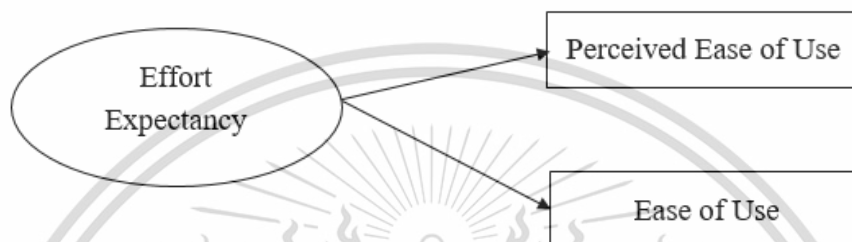


Figure 2.11. Effort Expectancy Model

2.8 Concepts and Theories of Social Influence

Venkatesh et al. (2003) described social influence as the degree to which a person perceives the importance of others' beliefs that he or she should use the new technology system. This idea was developed as a combination of three different concepts derived from three different models.

Table 2.8. Definitions of Social Influence

Scholar/Researcher	Definitions
Venkatesh et al. (2003)	The degree to which a person perceives the importance of others' beliefs that he or she should use the new technology system
Zhenghao, Alcorn, Christensen, Eriksson, Koller, and Emanuel (2015)	The extent to which one senses how significant it is that 'other people' believe he or she should use technology.

Scholar/Researcher	Definitions
Ajzen (1991)	A person's perception that most people who are important to him think he should or should not perform the behavior in question.

Table 2.8 presents the definitions of social influence from various researchers. From literature, this study defines social influence as the degree of a person's perception of what other people think of him in using MOOCs platforms and technology for learning.

The three concepts are the subjective norm, the social factor, and the image. These concepts share the same notion that the social environment that a person lives have a significant influence on the manner the person acts (Venkatesh et al., 2003). The concept of the subjective norm was derived from THE Theory of Reasoned Action (TRA) (Ajzen and Fishbein (1977), and later applied in the Theory of Planned Behavior (TPB) (Ajzen, 1985) and the hybrid model of Combined TAM and TPB (C-TAM-TPB (Taylor & Todd, 1995).

Table 2.9. Literature review on Social Influence

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Tan and Lau (2016)	Social Influence	- General Social Influence - Peer Social Influence	Education
Nordin, Norman, and Embi (2015)	Social Influence	- General Social Influence - Peer Social Influence	Education (MOOCs)
Sung, Jeong, Jeong, and Shin (2015)	Social Influence	- General Social Influence - Peer Social Influence	Education (mobile learning)
Sawsen Lakhhal, Hager Khechine, and Daniel Pascot (2013)	Social Influence	- General Social Influence - Peer Social Influence	Education
Juinn and Tan 2013	Social Influence	- General Social Influence - Peer Social Influence	Education

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Thomas, Singh, and Gaffar (2013)	Social Influence	<ul style="list-style-type: none"> - General Social Influence - Peer Social Influence 	Education

Table 2.9 presents the literature, theories, concepts, and research on the social influence construct, and the observed variables. From a review of these sources, this study identified 2 main observed variables for social influence. These are the general 1) social influence and 2) peer social influence, as discussed in the following sections.

The concepts define a person's perception of how important others think he or she should act. The second concept is the social factor, which implies the internationalization of culture and social agreements an individual shares with others. The social factor concept was derived from the Model of PC Utilization (Thompson et al., 1991). The third concept of the image was developed in the Innovation Diffusion Theory (IDT) (Rogers, 1995). Image concept could be understood as the concept that the use of new technology could upgrade the person's image or social status.

Based on the UTAUT model, researchers have investigated the influence of social influence on the behavioral intention to use technology, as well as the actual use of technology. Alaiad & Zhou (2014) conducted an empirical investigation of the determinants of the home health robot's adoption by applying the technology acceptance theories. The study used participants who were recruited from the home health agencies in the United States. The sample was 108 patients and healthcare professionals. The study results indicated that the usage intention of home healthcare robots was influenced by social influence, performance expectancy, trust privacy concerns, facilitating conditions, and ethical concerns. However, the study noted that social influence was the strongest predictor of home healthcare robots.

From the literature, concepts, theories, and researchers conducted on the social influence, the following model was developed for the social influence, which comprised two observed variables, as shown in figure 2.12 below.

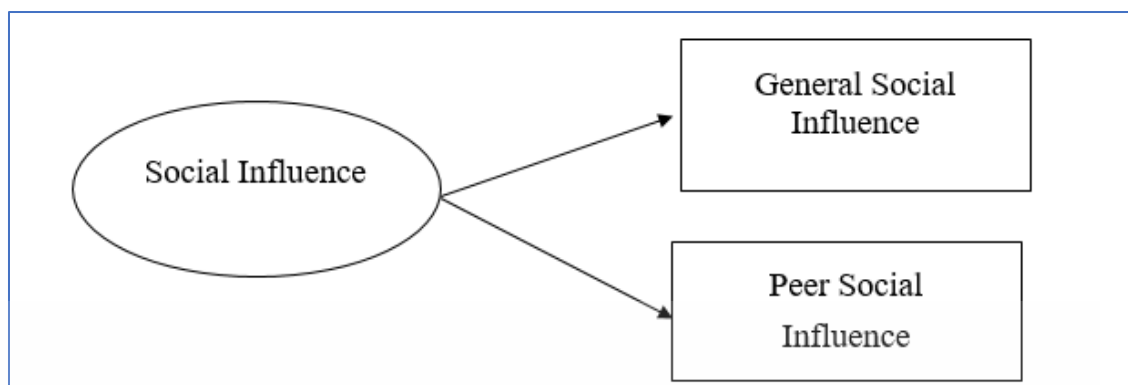


Figure 2.12. Social Influence

2.9 Concepts and Theories of Facilitating Conditions

Facilitating conditions imply the perception of an individual regarding the available resources and support to perform a behavior (Venkatesh et al., 2003).

Table 2.10. Definitions of Facilitating Conditions

Scholar/Researcher	Definitions
Venkatesh et al. (2003)	The degree to which an individual believes, the existence of the organization and technical infrastructure enables the use of a system
Zhenghao, Alcorn, Christensen, Eriksson, Koller, and Emanuel (2015)	The extent to which a person is convinced that the existing essential infrastructure promotes the technology used
Venkatesh, Brown, Maruping, and Bala (2008)	A construct that reflects a person's perception of his or her control over the behavior
Marchewka, Liu and Kostiwa (2007)	User's perception of support for technology use in terms of organizational and infrastructural level

Table 2.10 presents the various definitions for facilitating conditions constructs. Based on the researchers, this study has defined facilitating conditions as the extent to which a person believes that the available organizational and technical infrastructure is

available to support the use of MOOCs use. These may include a functional website, internet, computer, and the school infrastructure.

According to the UTAUT model, the facilitating conditions influences the technology used directly, based on the fact that in an organizational environment, facilitating conditions could serve as a proxy for actual behavioral control as well as a direct influence of behavior. This is because of the availability of the aspects of the facilitating conditions, such as training and support, which could be readily available to the users. However, it is essential to note that the facilitation conditions could vary significantly across technology, applications, among other aspects consideration. Several studies have been conducted to investigate the effect of facilitating conditions on the behavior intention to use technology.

Table 2.11. Literature review on facilitating conditions

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Nordin, Norman, and Embi (2015)	Facilitating Conditions	- Perceived Behavioral Control - Facilitating conditions	Education (MOOCs)
Magsamen-Conrad, Upadhyaya Joa & Dowd (2015)	Facilitating Conditions	- Perceived Behavioral Control - Facilitating conditions	Technology
Juinn and Tan (2013)	Facilitating Conditions	- Perceived Behavioral Control - Facilitating conditions	Education
Almatari, Iahad, and Balaid (2013)	Facilitating Conditions	- Perceived Behavioral Control - Facilitating conditions	Education

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Scholar/Researcher	Latent Variables	Observed Variables	Industry
Thomas, Singh, and Gaffar, (2013)	Facilitating Conditions	- Perceived Behavioral Control - Facilitating conditions	Education (Mobile Learning)
Sawsen Lakhal, Hager Khechine, and Daniel Pascot (2013)	Facilitating Conditions	- Perceived Behavioral Control - Facilitating conditions	Education
Nassuora (2012)	Facilitating Conditions	- Perceived Behavioral Control - Facilitating conditions	Education (Mobile Learning)

Table 2.11 presents the literature, concepts, theories, and research on the facilitating conditions and the associated observed variables. From the previous researches, this study observed that the construct of facilitating conditions has two observed variables; 1) perceived behavioral control and 2) facilitating conditions. These are discussed in the following sections.

Nassuora (2012) carried out a study on the students' acceptance of mobile learning for higher education in Saudi Arabia. This study was motivated by the fact that mobile learning is considered a developing factor in distance learning. Access to mobile learning has made learning possible, regardless of time and place, as well as an important tool for continued learning. The study applied the quantitative approach survey for 80 students. The study adopted a modified UTAUT model. The study revealed that effort expectancy and facilitating conditions have a highly significant effect on the acceptance of m-learning among students.

Magsamen-Conrad, Upadhyaya Joa & Dowd (2015) investigated the effect of facilitating conditions on a study using UTAUT to predict multigenerational tablet adoption practices. The study tested four UTAUT determinants, which are performance expectancy, effort expectancy, social influence, and facilitating conditions, and

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investigated how they affect the behavioral intention to use tablets. These variables were moderated by age, gender, and user experience. The study applied a total of 899 respondents within the age of 19-99 years. The study found that facilitating conditions and effort expectancy significantly influence the intention to use tablets after controlling for age, tablet use, and gender.

From the literature, concepts, theories, and researchers conducted on the facilitating conditions, the following model was obtained for the facilitating conditions, which comprised two observed variables, as presented in figure 2.8 below.

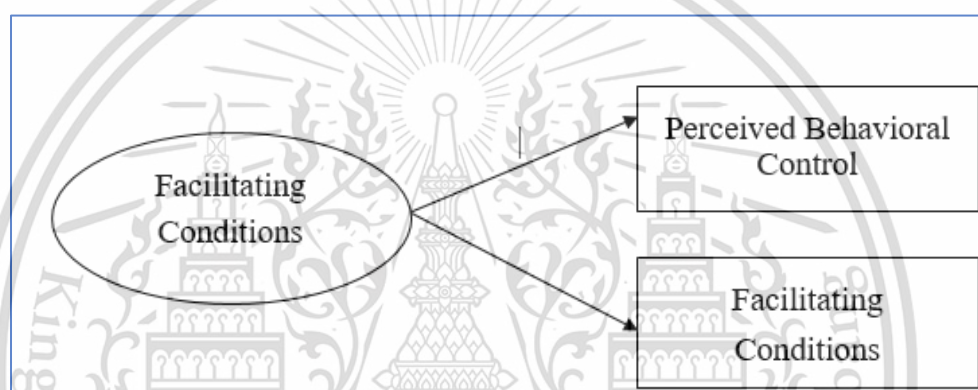


Figure 2.13. Facilitating Conditions Model

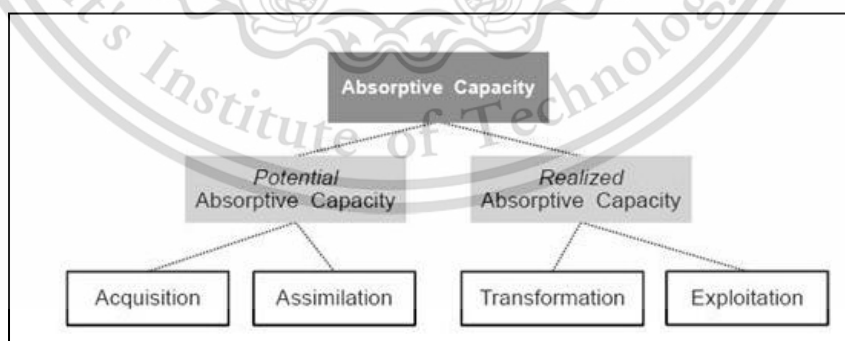
2.10 Concepts and Theories of Absorptive Capacity

Absorptive capacity implies the ability to locate and apply new ideas, technology, and innovation and incorporate them within the organization process (Cohen and Levinthal, 1990). Absorptive capacity is considered a great contributor and determinant of an organization's success (Cohen and Levinthal, 1990; Zahra and George, 2002).

Table 2.12. Definitions of Absorptive Capacity

Scholar/Researcher	Definitions
Cohen and Levinthal, (1990)	Implies the ability to locate and apply new ideas, technology, and innovation and incorporate them within the organizational process
Link and Siegel (2002)	Firm's ability to absorb, assimilate and exploit an innovation throughout a firm
Cohen and Levinthal (1990)	The ability to locate and apply new ideas, technology, and innovation and incorporate them within the organizational process

Absorptive capacity is theoretically located between the fields of knowledge management, organization learning, and dynamic capabilities (Chiva and Allegre, 2005; Oshri et al., 2006). The concept is developed from the need to acquire knowledge from the external environment, as well as the internal processes of learning from the experience and current actions to develop sustainable competencies. Several studies have researched absorptive capacity, particularly from technological innovation networks.

**Figure 2.14.** Theory of Absorptive Capacity

Source: Chiva and Allegre, (2005); Oshri et al., (2006)

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Cohen and Levinthal (1990) coined the concept of ‘absorptive capacity’, which was defined as the firm’s ability to identify, assimilate, and exploit knowledge from the environment. According to Cohen and Levinthal (1990), absorptive capacity is critical in the context of MOOCs utilization as a means of supporting the individual’s innovation capabilities, as well as success in the innovative learning process. The factors, which influence the extent of absorptive capacity, include the relevance of prior knowledge and institutional mechanisms.

Table 2.13. Literature review on Absorptive Capacity

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Garcia-Morales et al. (2019)	Absorptive Capacity	<ul style="list-style-type: none"> - Knowledge acquisition - Knowledge assimilation - Knowledge transformation 	Education
Ali, and Park (2016)	Absorptive Capacity	<ul style="list-style-type: none"> - Knowledge acquisition - Knowledge assimilation - Knowledge Transformation - Knowledge Exploitation 	Technology
Arifin, Fontana, and Wijanto (2016)	Absorptive Capacity	<ul style="list-style-type: none"> - Knowledge acquisition - Knowledge assimilation - Knowledge transformation - Knowledge exploitation 	Business

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Scholar/Researcher	Latent Variables	Observed Variables	Industry
Huang, P., and Lucas, H. (2015)	Absorptive capacity	<ul style="list-style-type: none"> - Knowledge acquisition - Knowledge assimilation - Knowledge Transformation 	Education (MOOCs)
Arifin (2015)	Absorptive capacity	<ul style="list-style-type: none"> - Knowledge acquisition - Knowledge assimilation - Knowledge Transformation 	Technology
Juinn and Tan 2013	Absorptive Capacity	<ul style="list-style-type: none"> - Knowledge acquisition - Knowledge assimilation - Knowledge transformation 	Education

Table 2.14 Literature review on Absorptive Capacity

From the literature review, theories, and concepts presented in table 2.13 above, this study has found that absorptive capacity has three observed variables, 1) Knowledge acquisition 2) Knowledge assimilation, 3) Knowledge Transformation

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Huang, P., & Lucas, H. (2015) investigated the aspect of the absorptive capacity and the adoption and use of MOOCs in higher education under the role of educational, informational technology. MOOCs adoption is considered significant as an aspect of advanced information technology, with massive potential of transforming the education system. The study applied a longitudinal dataset from the combination of the historical data from the US colleges and universities which have adopted the use of MOOCs. The study indicated that the factors that contributed to MOOCs adoption were the use of web 2.0 social media and the prior experience of the school with distance learning.

Arifin (2015) investigated the effect of dynamic capabilities on technology adoption and its determinant factors for improving a firm's performance. The technology adoption was considered as a functional capability, which mediates between the dynamic capabilities and performance of the firms. The study focused on the determinant factors of technology adoption, at the firm level, which helps in the prediction of the company performance in a dynamic environment. The determinant factors used in the study were externalities, entrepreneurial leadership, slack resources, and absorptive capacity. The result of the survey indicated that absorptive capacity has a close relationship with the technology adoption and performance of the firms.

From the literature, concepts, theories, and researchers conducted on the absorptive capacity, the following model was obtained for the absorptive capacity, which comprised three observed variables, as shown in figure 2.10 below.

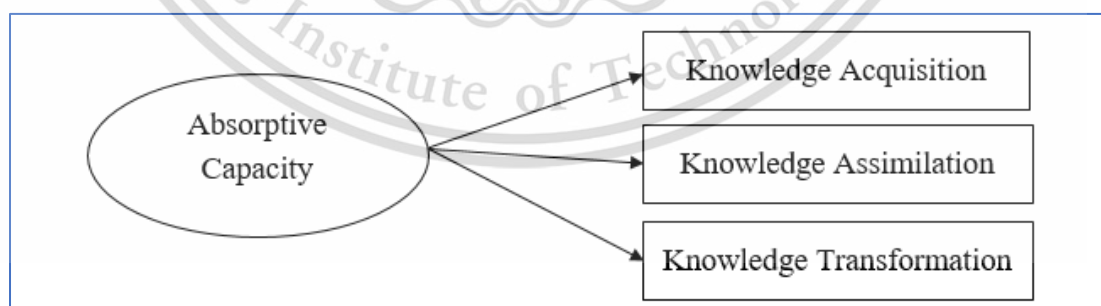


Figure 2.15. Absorptive Capacity Model

2.11 Concepts and Theories of Perceived Autonomy

From literature, autonomy implies the degree to which an individual experiences or exercises the freedom of choice in terms of the ability to lead a self-determined life. Various authors have presented various definitions of perceived autonomy, as discussed in the table hereunder.

Table 2.15. Definitions of Perceived Autonomy

Scholar/Researcher	Definitions
Yang (2014)	Implies the degree to which an individual experiences or exercises the freedom of choice in terms of ability to lead a self-determined life
Chen and Jang (2010)	The perception of freedom of choice
Warschburger (2009)	It is the constant urge to be the cause of one's own action rather than the feeling of external forces causing them
Deci and Ryan (1985)	The need for freedom, or the perceived choice over one's action

Table 2.14 above presents the various definitions of perceived autonomy, according to various researchers. This study defines perceived autonomy as the extent to which an individual feels that he/she has an ability to exercise the freedom of choice in terms of MOOCs learning.

Yang, Q. (2014) investigated the MOOCs with regard to its extension with regard to the extension of aspects of the program and developing the future aspects of the MOOCs technology. The study indicated that there is a significant association between MOOCs engagement and online discussion. The findings of the study indicated that the factors that influence students' adoption of online discussion and the resultant use of MOOCs include perceived process, perceived autonomy, perceived competence, and perceived relatedness.

The study further indicated that students' intrinsic motivation and their perceived value significantly remained at a moderately high level.

Table 2.16. Literature Review on Perceived Autonomy

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Lan, and Hew, K. F. (2020)	Perceived Autonomy	- Sense of Responsibility - Self Confidence - Freedom	Education (MOOCs)
Ahearn et al. (2017)	Perceived Autonomy	- Sense of Responsibility - Self Confidence - Freedom	Education
Yang (2014)	Perceived Autonomy	- Sense of responsibility - Self Confidence - Freedom	Education (MOOCs)
Lakhal et al. (2013)	Perceived Autonomy	- Sense of Responsibility - Self Confidence - Freedom	Education
Giesbrecht, Pfister, and Schwabe (2012)	Perceived Autonomy	- Sense of Responsibility - Self Confidence - Freedom	Education
Chen, and Jang (2010)	Perceived Autonomy	- Sense of Responsibility - Self Confidence - Freedom	Education (Online learning)

Table 2.15 above presents the literature review, theories, concepts, and researchers' findings on the construct of perceived autonomy. From the review of literature, this study concludes that perceived autonomy has three observed variables: 1) sense of responsibility, 2) self-confidence, and 3) freedom.

Chen & Jang (2010) studied the motivation behind online learning under the model of self-determination theory. The study was motivated by the need to understand the reasons behind online learning and its origin. The findings of the study indicated that there are mediating effects between the self-satisfaction needs and the self-determination aspects. The perceived autonomy of the students is influenced by support for autonomy and competency. Online learning of the students is influenced by factors such as perceived autonomy, perceived relatedness, and perceived competency.

From the literature, concepts, theories, and researchers conducted on the perceived autonomy, the following model were obtained for the perceived autonomy, which comprised of three observed variables, as shown in figure 2.11 below.

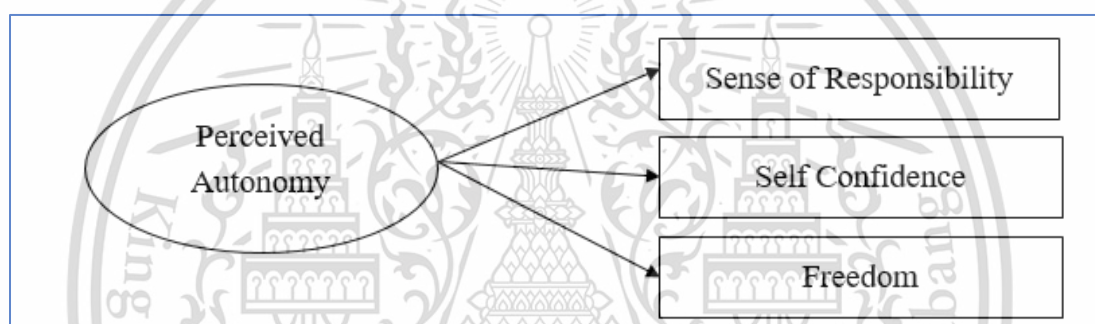


Figure 2.16. Model for Perceived Autonomy

2.12 Culture as a Moderating Variable

According to Hofstede's (1980), culture implies the collective programming of the mind, which distinguishes the members of a particular group from the others. According to Hofstede's (1980), there are four different dimensions of national culture that exists; these include masculinity/femininity, uncertainty avoidance, individualism/collectivism, and power distance. Long-term orientation was added as the fifth cultural dimension (Hofstede and Bond 1988). These natural, cultural values are discussed below.

Table 2.17. Definitions of Culture

Cultural Dimension	Definition
Hofstede's (1980)	Culture implies the collective programming of the mind, which distinguishes the members of a particular group from the others
Individualism/collectivism	The degree to which an individual focuses on personal needs, rather than group needs, and act individually rather than working within a group of individuals (Srite & Karahanna, 2006).
Uncertainty avoidance	This dimension implies the extent to which an individual is willing to take up the risk. This extent is dependent on aspects such as rule obedience, labor mobility, and ritual behavior. It evaluates the level at which an individual would feel threatened by ambiguous situations (Srite & Karahanna 2006).
Power Distance	This is the extent to which the differences in power and inequalities are accepted and considered normal in society. It is the extent to which an employee would perceive the employer to have more power (Srite & Karahanna 2006).
Masculinity/Femininity	This implies the degree to which an individual recognizes or adopts the aspect of gender inequality. People who support masculine gender inequality have an emphasis on work goals, such as assertiveness, performance, advancement, earnings, and competitiveness. On the other hand, individuals who espouse feminine values tend to put more emphasis on aspects such as quality of life, warm personal relationships, friendly atmosphere, and

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Cultural Dimension	Definition
	comfortable working relationships (Srite & Karahanna 2006).

There have been few studies that have evaluated the effect of culture on technology acceptance. (Srite & Karahanna 2006) is among them, which investigated the role of the espoused national cultural values in technology acceptance. The study used age, gender, experience, and voluntariness as the major moderators of the belief in technology acceptance. The findings of the study indicated that behavioral models do not hold across cultures. The paper indicated that national, cultural values are important individual moderators in technology acceptance. The social norms were found to be stronger determinants of behavioral intention for individuals who value feminine and high uncertainty avoidance. The dimension of masculinity/femininity did not moderate the relationship between behavioral intention to use technology and perceived usefulness. However, the masculinity/femininity dimension moderated between perceived ease of use and the behavioral intention to use technology.

Table 2.18. Literature review on culture

Scholar/Researcher	Latent Variables	Observed Variables	Industry
Jung and Lee (2019)	Culture	<ul style="list-style-type: none"> - Masculinity/Femininity - Uncertainty Avoidance - Individualism/Collectivism - Power Distance - Community life (communalism) 	Education
Yavwa and Twinomurinzi (2018)	Culture	<ul style="list-style-type: none"> - Spiritual beliefs (spiritualism) - Respect for authority and elders - Hospitality and tradition 	Government Services

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Scholar/Researcher	Latent Variables	Observed Variables	Industry
Rabaa'i (2017)	Culture	<ul style="list-style-type: none"> - Cultural influence - Cultural awareness - National culture 	Government Services
Pinpathomrat, N. (2017)	Culture	<ul style="list-style-type: none"> - Collectivism - Power distance - Uncertainty avoidance - Masculinity 	Technology
Yoo et al. (2011)	Culture	<ul style="list-style-type: none"> - Masculinity/Femininity - Uncertainty Avoidance - Individualism/Collectivism - Power Distance 	Education
Im et al. (2011)	Culture	<ul style="list-style-type: none"> - Masculinity/Femininity - Uncertainty Avoidance - Individualism/Collectivism - Power Distance 	Education
Srite (2006)	Culture	<ul style="list-style-type: none"> - Masculinity/Femininity - Uncertainty Avoidance - Individualism/Collectivism - Power Distance 	Education

Jung & Lee (2019) carried out a study on the cross-cultural approach to the adoption of open educational resources in higher education. The study was prompted by increasing adoption and use of open educational resources (OER) in higher education, which is affecting teaching and learning quality. The study investigated the factors affecting the OER adoption by university educators, in three different cultural contexts. The study applied the UTAUT2 model. The data was collected from a sample of 152 educators in three different countries, the United States, Korea, and Japan. In every culture, habit emerged as the strongest determinant of the behavioral intention to use OER. Other significant factors that influenced behavioral adoption of OER varied across cultures.

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Performance expectancy was the strongest in Korea, social influence in Japan, and price value in the United States. Culture's moderating effect was found to be significant in their study.

2.13 Variable Relationship Analysis

In an effort to establish the relationship between the behavioral intention to use MOOCs among learners, the researcher examined and reviewed the literature and researches on the relationship among the endogenous latent variable, mediator variables, and exogenous latent variables. These relationships are discussed in the following sections.

Relationship between UTAUT constructs and Behavioral Intention to Use

The attitudes towards MOOCs significantly predict the behavioral intention to use them. MOOCs, being a new kind of learning system has, and is attracting numerous users worldwide to participate in it. It is a learning system, which is not limited to time and space and is, therefore, providing the best educational resources and learning experience. Several studies have researched the relationship between intention to use and MOOCs.

Tseng, Lin, Wang, & Liu (2019) studied the relationship by investigating the teacher's adoption of MOOCs, from the perspective of UTAUT2 model. The study was conducted as a means of facilitating teachers' adoption and acceptance of the MOOCs. The study was collected from the survey of Taiwan University. The study adopted the Partial Least Square Structural Equation Model to analyze the data. The research adopted the following conceptual framework.

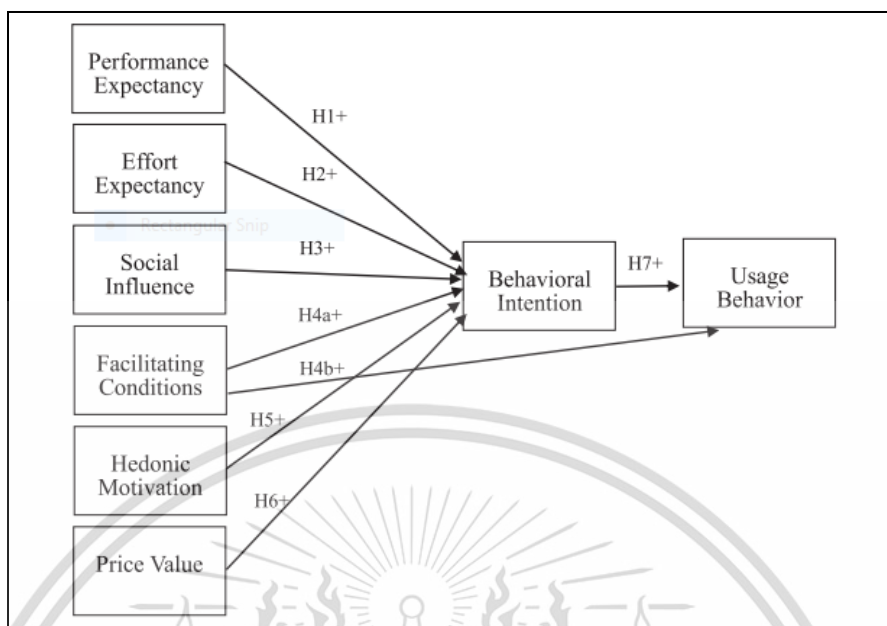


Figure 2.17. Adjusted UTAUT2 Model

Source: Tseng, Lin, Wang & Liu (2019)

The study findings revealed that performance expectancy, social influence, facilitating conditions, and price value influenced the behavioral intention to use MOOCs technology. The study also revealed that facilitating conditions and behavioral intention to adopt MOOCs. However, effort expectancy and heroic motivation did not have an influence on the teachers' adoption of MOOCs.

Khan, Hameed Yu, Islam, Sheikh & Khan (2018) study predicted the acceptance of MOOCs in a developing country, by applying the task technology fit model, social motivation, and self-determination theory. Specifically, the study investigated the factors influencing the students' acceptance of MOOCs. They had an additional study on the moderating effects of perceived reputation on student's adoption behavior. The study adopted a total of 414 respondents and analyzed the data using the structural equation model using the smart-PLS. The results of the study indicated that task characteristics and technical characteristics in the task-technology fit have a significant influence on the behavioral intention to use MOOCs. Additionally, perceived competence, social recognition, perceive relatedness has a significant positive influence on the behavioral

intention to use technology. The perceived reputation was considered to have significant moderating effects on the students' usage behavior.

Ab Jalil, Ma'rof & Omar (2019) studies the attitude and behavioral intention to develop and use MOOCs among academics. The study was driven by the intention to explore how learners respond to new teaching methods when practice-oriented teaching techniques are placed online, such as the Open Courseware and MOOCs. The study used a total of 238 participants as a study sample from a public university in Malaysia. The study adopted the descriptive and Pearson's Correlation to establish the relationship between the variables. The results were divided into four aspects. First, participants had a positive response to MOOCs as a new alternative to teaching. Second, respondents were ready to develop and accept MOOCs. Third, the respondents were ready to use MOOCs as a new technique for delivering teaching and learning. Fourth, there was a significant relationship between the perspective of academic staff and behavioral intention to use MOOCs.

Gao & Yang (2015) explored the users' adoption of MOOCs from the perspective of the industrial theory. The study was driven by the fact that though MOOCs have received global attention of millions of users globally, there is little literature existing on it. The study applied an extension of the TAM with an additional three factors from the institutional theory. The study applied a total of 247 participants. The study adopted the following conceptual framework.

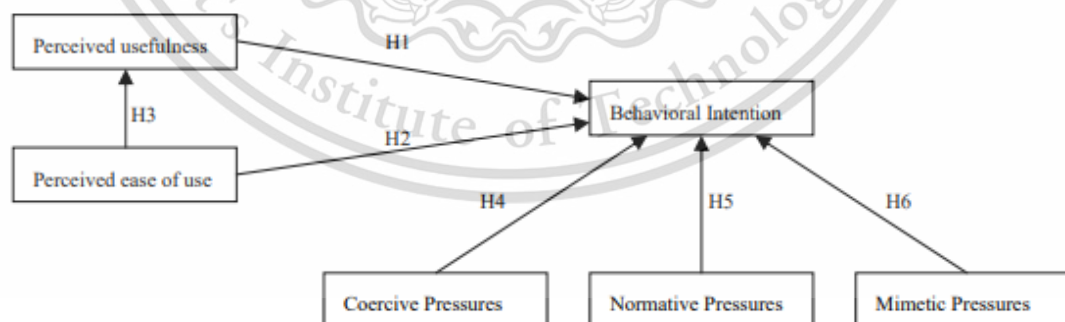


Figure 2.18. TAM Model

Source: Gao & Yang (2015)

The results of the study indicated that perceived usefulness and perceived ease of use have a significant influence on the behavioral intention on the use of MOOCs. The study also indicated that habitual pressure depicted a significant positive effect on the users' behavioral intention to use MOOCs.

2.11.1 Relationship between Performance expectancy and Behavioral Intention to Use

Perceived expectancy implies the degree to which an individual believes that the use of a particular technology would result in improved performance. It is argued that if users believe that the use of a particular system would improve their performance, then their behavioral intention to use the technology would be high, and vice-versa. Several studies have investigated the relationship between behavioral intention to use and perceived usefulness.

Gupta & Dogra (2017) carried out a study on the tourist adoption of the mapping apps, using a UTAUT2 model of smart travelers. The mapping apps are new technologies used as locational-based travel apps for navigation and routing. The study was driven by the scarce literature on technology, despite their wide global usage. The study applied the UTAUT2 model, and the data was collected from a total of 284 travelers from India. The data analysis was done using the Partial Least Square technique. The following conceptual framework was applied.

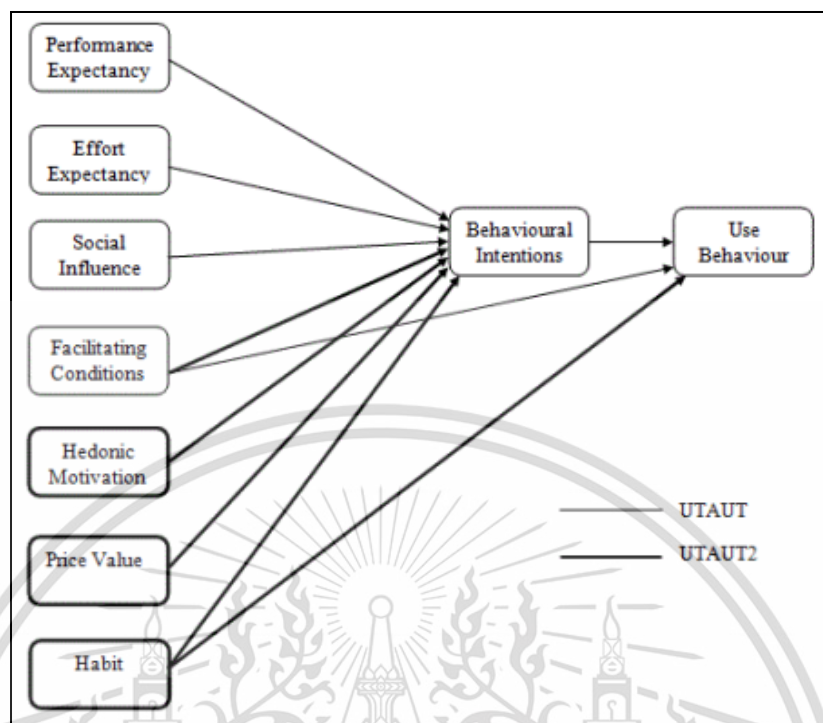


Figure 2.19. Extended UTAUT2 Model

Source: Gupta & Dogra (2017)

The results of the study indicated that the factors that have a significant influence on behavioral intention to use mapping apps were habits, facilitating conditions, hedonic motivations, and performance expectancy. The study further indicated that the actual usage of mapping app behavior was influenced by the traveler's intention and habit to use technology. However, factors that were found to have a significant effect on the intention to use mapping app by tourists included price value, social influence, and effort expectancy.

San Martín & Herrero (2012) studied the factors that influence the adoption of new information technologies by rural tourism users. The specific study was on the psychological factors that influenced an individual's behavioral intention to use websites to book reservations and accommodations in hotels. As depicted in the following conceptual framework, performance expectancy was among the factors investigated.

The model was based on the UTAUT model, which was made up of five explanatory variables of the intention to use the technology (Martín & Herrero, 2012).

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These were performance expectancy, effort expectancy, facilitating conditions, innovativeness, and social influence. The data was collected from a sample of 1083 tourists who had some previous experiences using websites to book reservations and accommodations. The empirical results indicated that the intention to make an online purchase was significantly influenced by performance expectancy and effort expectancy with regard to the online purchasing and level of users' innovativeness. Additionally, the innovations factor was found to have a significant moderating effect between performance expectancy and purchase intention.

Slade, Williams, Dwivedi & Piercy (2015) investigated the factors that influence the proximity of mobile payment systems (MPS), which has a significant effect on the transactional processes. The study explored the potential of consumer adoption of new technology with consideration of the trust and risk constructs. The study used a total of 244 UK consumers as a sample. The findings of the study suggested that there is an ore variance in behavioral intention as a result of the extended model. Performance expectancy was also considered to have the greatest significant influence on the adoption of mobile payment systems.

From the review of the above literature review, this study concluded that there is a positive relationship between performance expectancy and the behavioral intention to use MOOCs.

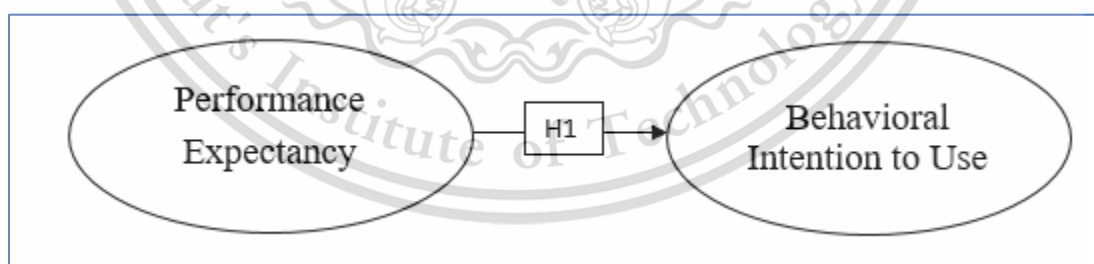


Figure 2.20. Performance Expectancy and Behavioral Intention to Use

2.11.2 Relationship between Effort Expectancy and Behavioral Intention to Use

According to Miadinovic and Xiang (2016), effort expectancy implies the expectation of an individual of how much effort is needed to use a particular information

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technology system. If the effort expectancy is high, there is a possibility of higher behavioral intention to use technology and vice-versa. Various studies have been conducted to investigate the relationship between the two aspects.

Alkhunaizan & Love (2012) carried out a study on the factors that influences the use of mobile commerce use as an empirical review of the revised UTAUT model. The study was driven by the fact that user acceptance is critical when it comes to development and success in mobile commerce. The study was carried out in Saudi Arabia. The study revised the UTAUT model and included two additional constructs, cost, and trust, which would enhance the aspects of e-commerce acceptance and usage, as presented in the graph below.

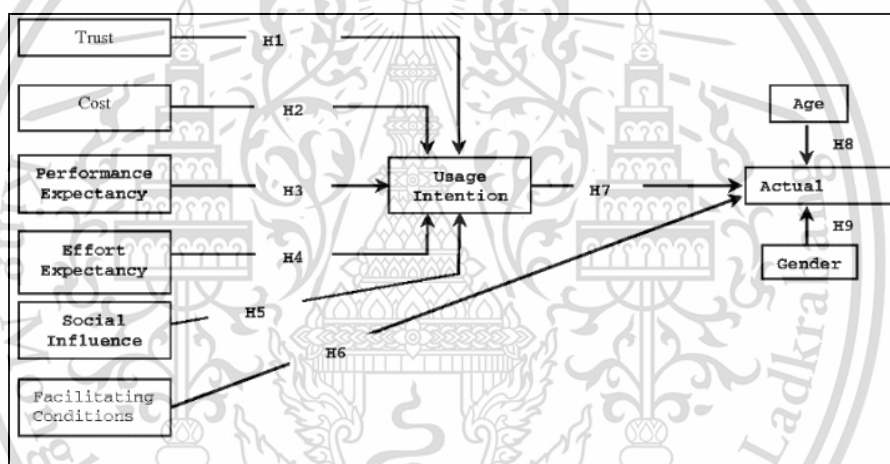


Figure 2.21. UTAUT Model with additional constructs of cost & trust

Source: Alkhunaizan & Love (2012)

A total of 574 respondents were used. The results indicated that effort expectancy, performance expectancy, and costs have a significant influence on the behavioral intention to use mobile commerce technology.

Wang (2010) investigated the factors affecting the user acceptance of the mobile internet based on UTAUT model. The study also incorporated the effects of gender differences in aspects of whether gender differences affect the behavioral intention to use mobile internet. The study used a total of 343 respondents from Taiwan, using the structural equation model. The findings of the study are presented below.

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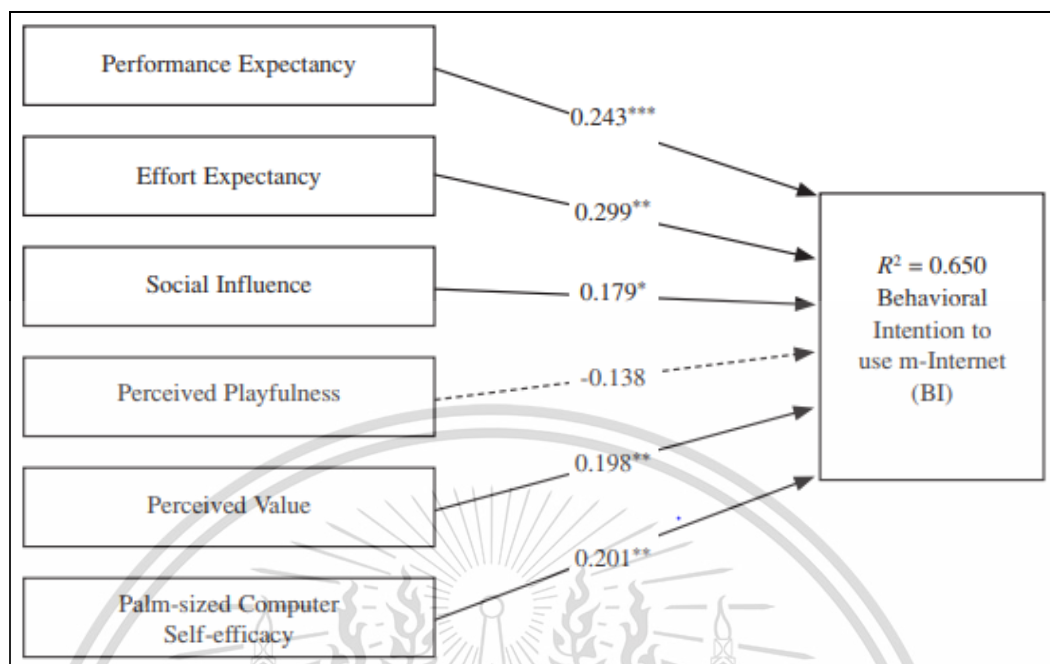


Figure 2.22. UTAUT Model

Source: Wang (2010)

As shown in the figure above, exogenous variables from the UTAUT model (performance expectancy, perceived usefulness, and social influence depicted a positive and significant influence on behavioral intention to use. Among them, effort expectancy is seen to have the highest effect. This implied that most of the users were concerned about how long and how easy or hard it is to use the mobile internet.

From the review of the above literature review, this study concluded that there is a positive relationship between performance expectancy and the behavioral intention to use MOOCs.

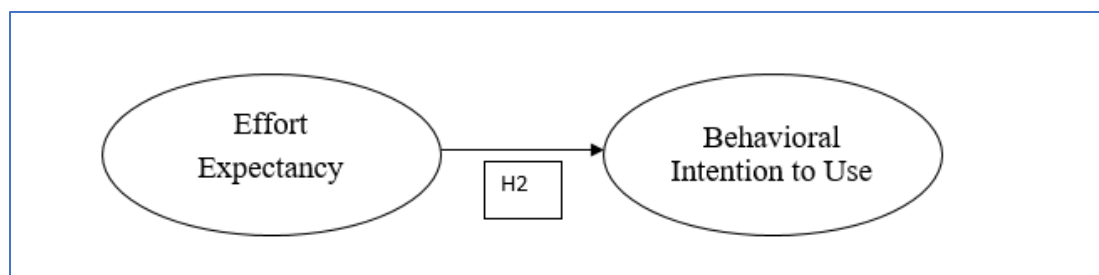


Figure 2.23. Effort Expectancy and the Behavioral Intention to Use

2.11.3 Relationship between Social Influence and Behavioral Intention to Use

Social influence, according to Evon and Lau (2016), is the extent to which the usage of a system by a person is influenced by the views, recommendations, and insights of others. It is considered a significant influencer of the behavioral intention to adopt technology in various studies.

The research results of Morosan and DeFranco (2016), where the author discovered that social influences have an effect on NFC- Mobile purchase in hotels. Morosan and DeFranco (2016) investigated the factors that influence the consumers' intention to use the near field communication (NFC) mobile payments in hotels, using the UTAUT2 model. The study was driven by the deadline of 2015, by which all the merchants in the U.S were required to have accepted Europay Mastercard and Visa (EMV) payment methods. The study was conducted utilizing data from 794 hotel consumers from the general population of the U.S. using the modified UTAU2 model; the results of the study indicated that two factors, social influence and performance expectancy, significantly influenced behavioral intention to use NFC payment systems.

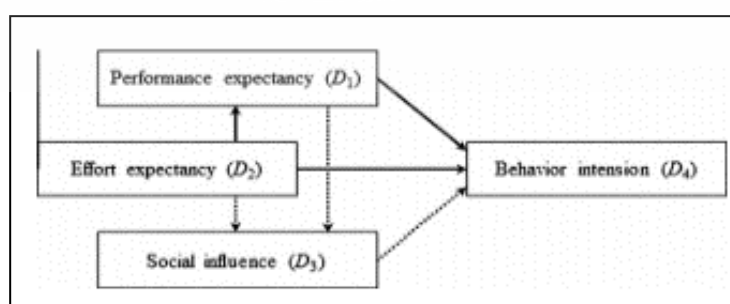


Figure 2.24. UTAUT Model with DEMATEL Technique

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Jeng & Tzeng (2012) investigated the effect of the social influence on the behavioral intention to use the clinical decision support system, applying the UTAUT model and the DEMATEL technique. The authors argued that while the TAM model has been applied in the investigation of technology acceptance, there is always an exclusion of the concepts of system diversity and the user's profession. Additionally, the authors argued that causal analysis, which has a significant influence on the decision-making process, is poorly evaluated due to the misapplication of the methods of SEM used to analyze it. The model applied is illustrated below.

The study applied the Decision Making Trial and Evaluation Laboratory (DEMATEL) to evaluate the usual relationships between the UTAUT model variables. The results of the study indicated that social influence does not have a significant influence on the behavioral intention to use a clinical decision support system (CDSS) for medical professionals.

Tan & Lau (2016) studied the relationship between self-efficacy, social influence, performance expectancy, and effort expectancy, and behavioral intention to use mobile learning services. The study was based on the extended TAM. The study was conducted to investigate the effects of social influence, performance expectancy, and effort expectancy on behavioral intention to use mobile learning, with self-efficacy. The study was conducted on 226 university students of Gyeongnam province of South Korea, using a cross-sectional questionnaire survey. The conceptual framework applied is shown below.

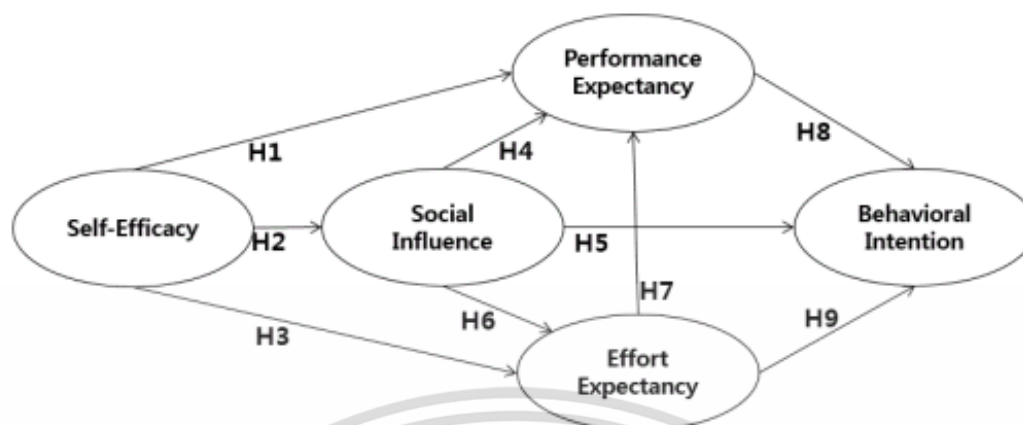


Figure 2.25. Technology Acceptance Model (TAM)

Source: Tan & Lau (2016)

The study applied structural equation modeling (SEM). The results of the study indicated that self-efficacy has a significant positive influence on performance expectancy, social influence, and effort expectancy. Social influence also has a significant influence on performance expectancy and behavioral intention to use mobile learning services.

From the review of the above literature review, this study concluded that there is a positive relationship between social influence and the behavioral intention to use MOOCs.

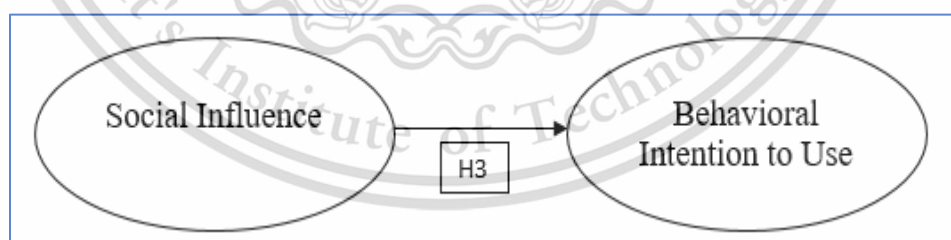


Figure 2.26. Social influence and the behavioral intention to use

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

2.11.4 Relationship between Facilitating Condition and Behavioral Intention to use

The facilitating conditions, according to Venkatesh, Thong & Xu (2012) implies the extent to which existing organizational, infrastructure facility, and technical aspects help in facilitating the usage of the information technology system. Some of the facilitating conditions include downloadable applications, smartphones, websites, and an internet connection, among others. According to Venkatesh et al. (2012), the perceived autonomy has a significant influence on the behavioral intentions to use.

Sam & Baharin (2018) investigated the factors that influence the users' behavioral intention to use the online booking system for car services as the Car Service Centre in Malacca. The study was driven by the increasing use of online booking by various economic sectors, including hotels, airlines, and tourism, as a way of enhancing their organizational performance. The study used a sample size of 384 respondents using the constructs of UTAUT2 model. The following conceptual framework was adopted.

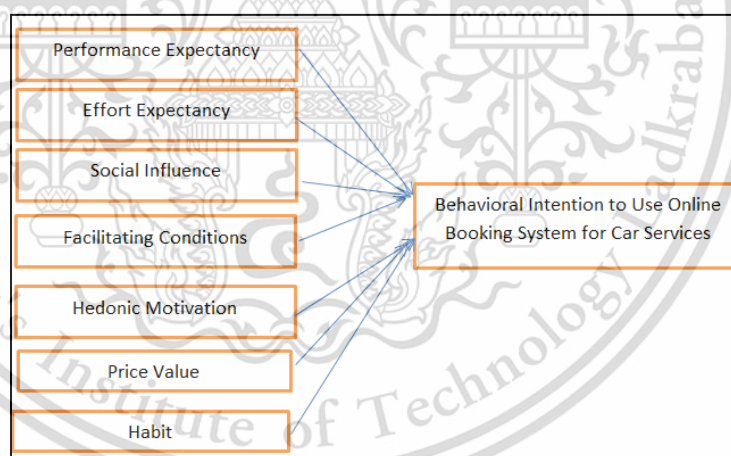


Figure 2.27. UTAUT2 Constructs

Source: Sam & Baharin (2018)

The results of the study indicated that there exists a positive relationship between performance expectancy, effort expectancy, social influence, facilitating conditions, price value, and hedonic motivation, and the behavioral intention to use online

booking systems. Facilitating conditions were found to have a positive and significant relationship with the behavioral intention to use.

Almatari, Iahad & Balaid (2013) investigated the factors influencing a student's intention to use mobile learning. The research was activated by the emergence of mobile learning in the education sector of the economy, such as education, training, and content delivery, without the geographical and time limitation. The study was carried using students' respondents from a university using UTAUT model. The study revealed that facilitating conditions have a significant influence on the behavioral intention to use mobile learning.

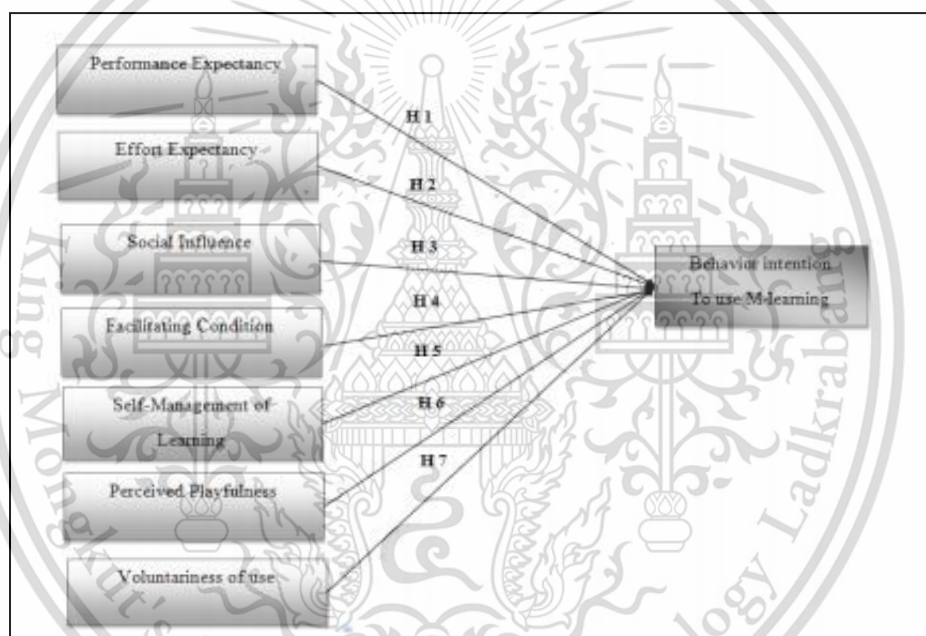


Figure 2.28. Facilitating Condition and Behavioral Intention to use

Source: Almatari, Iahad & Balaid (2013)

From the review of the above literature review, this study concluded that there is a positive relationship between facilitating conditions and the behavioral intention to use MOOCs.

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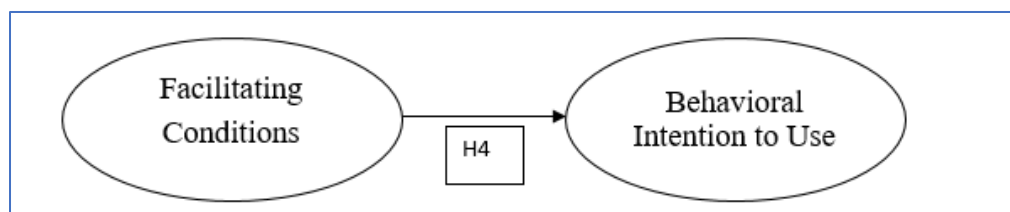


Figure 2.29. Facilitating condition and the behavioral intention to use

2.11.5 Relationship between Absorptive Capacity and Behavioral Intention to use

Absorptive capacity implies the ability of an organization to adopt and assimilate new technology. Absorptive capacity has a stronger influence on the innovation performance of an organization. This is because organizations with a higher level of absorptive capacity tend to adjust their internal organization to changes in the environment and adjust to the opportunities, solutions, and exploiting the available opportunities. Several researchers have researched the relationship between absorptive capacity and behavioral intention to use.

Scuotto, Del Giudice & Carayannis (2017) investigated the effects of social networking sites and the absorptive capacity of SMEs innovation performance. The study was driven by the importance of the ecosystem on the role of social networking sites in relation to knowledge and innovation. The study was conducted the study using a sample of 215 small and medium enterprises. These were from different sets of global enterprises, both knowledge-intensive and labor-intensive.

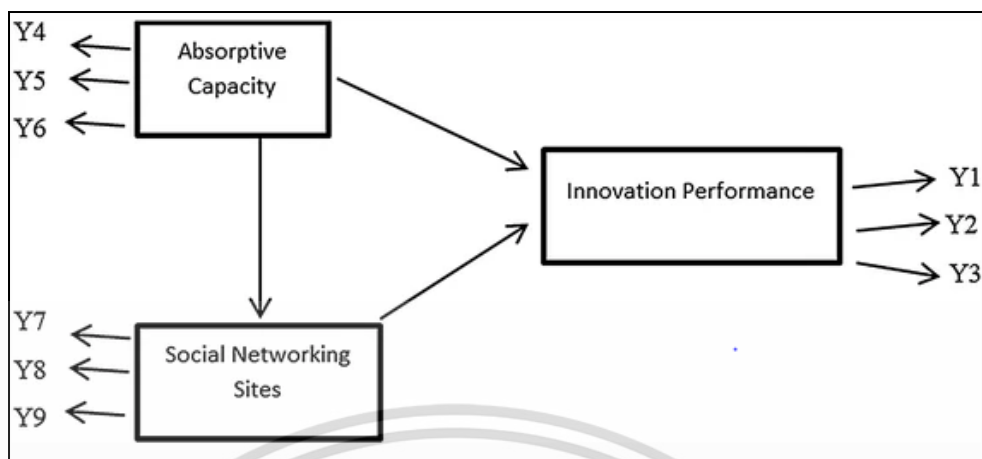


Figure 2.30. Absorptive Capacity and Behavioral Intention to use

Source: Scuotto, Del Giudice & Carayannis (2017)

The Partial Least Square Path modeling was applied, to establish the relationship between social networking sites, absorptive capacity, and innovation performance. The findings revealed that absorptive capacity has a significant influence on the behavioral intention to use SME innovations.

Mayeh, Ramayah & Mishra, (2016) study the role of absorptive capacity, communication, and trust in the ERP adoption. The variables were considered as important factors to evaluate the intention to use ERP systems. The study was driven by the importance of Enterprise Resource Planning (ERP) in today's business world and its associated high costs. TAM model was adopted, where the data was collected from 184 responses from 7 organizations in Iran. The results indicated that trust, perceived ease of use, and perceived usefulness have an effect on the intention to use. The absorptive capacity influences perceived ease of use, which in turn influences the intention to use ERP.

Mayeh, Ramayah & Popa (2014) evaluated the role of absorptive capacity in the usage of the complex information system under a case study of the Enterprise Information System. The study was carried out in Iran in a field study. The unit of analysis is the ERP users in the organizations employing ERP systems. The data were analyzed using structural equation modeling. The results of the study indicated that all three categories of absorptive capacities, application, and understanding and assimilation absorptive capacities had a significant influence on the intention to use ERP systems. To

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have a successful implementation of ERPs, the managers must assess the absorptive capacity of the users.

From the review of the above literature review, this study concluded that there is a positive relationship between absorptive capacity and the behavioral intention to use MOOCs.

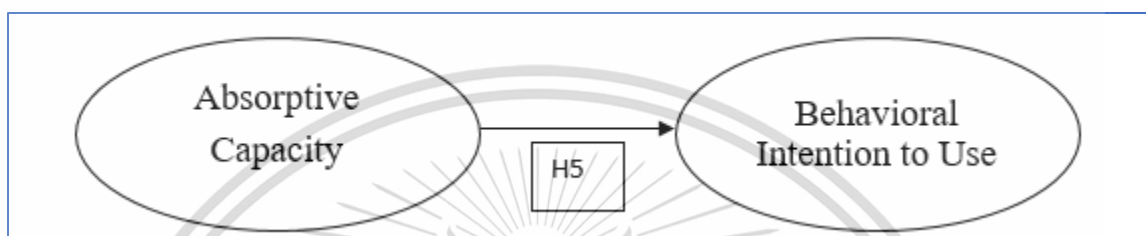


Figure 2.31. Absorptive capacity and the behavioral intention to use

2.11.6 Relationship between Perceived Autonomy and Behavioral Intention to Use

Perceived autonomy implied the degree to which an individual considers having control over themselves and the right to make their own decisions. People who perceive to have a higher level of autonomy can make their personal choices, according to their best interest. Several studies have been conducted regarding the concept of perceived autonomy.

A study carried out by Lan & Hew (2020) examined the learning engagement in MOOCs through the self-determination of a theoretical perspective using a mixed-method. The study investigated the ability of perceived autonomy to predict the MOOCs three types of engagement, behavioral engagement, emotional engagement, and cognitive engagement. The study applied a regression analysis to predict the effects. The results of the study indicated that perceived autonomy had a positive impact on behavioral engagement, where the beta was 0.312.

A study by Wilson & Rodgers (2004) investigated the relationship between perceived autonomy and behavioral intention to use. The study was carried out under the study on the relationship between perceived autonomy support, behavioral intention as well as exercise regulations in women. The study revolved around the examination of self-

determination theory. This involved the proposition of autonomy, which underpin various regulations associated with the perception of the prediction of behavioral intention in the context of exercises. The study used a total of 232 respondents as the sample size. Bivariate correlations were conducted, which indicated that there is a relationship between perceived autonomy and behavioral intention.

Jang, Reeve & Deci (2010) investigated the factors of engaging students in the learning activities. The study investigated whether it is the autonomy support or structure but the autonomy support and structure. The study was conducted in 33 public high school classrooms. The results of the study indicated that the students' online study engagement was influenced by the autonomy support and structure, while both the autonomy support and structure have a significant effect on the students' behavioral engagement.

Sierens, Vansteenkiste, Goossens, Soenens & Dochy (2009) carried out a study on the synergetic relationship between the perceived autonomy support and structures in the context of predicted self-regulated learning. The study employed a sample of 526 student respondents as a sample size. The study found that there is a positive relationship between perceived autonomy and behavioral intention to undertake the self-regulated learning.

From the review of the above literature review, this study concluded that there is a positive relationship between perceived autonomy and the behavioral intention to use MOOCs

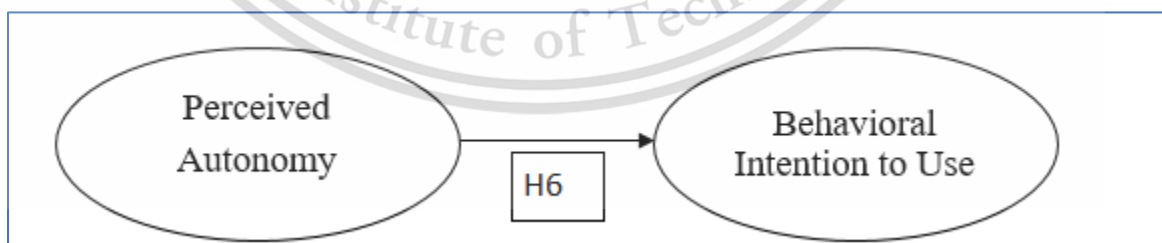


Figure 2.32. Perceived Autonomy and the behavioral intention to use

The literature review of the relationship between the variables is summarized in table 2.17 below

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Table 2.19. Summary of the relationship between variables, hypothesis, and researchers

Hypot hesis	Relationships	Authors/Relationships
H1	Performance expectancy and Behavioral Intention to use MOOCs	Gupta & Dogra (2017); Tan & Lau (2016); Slade, Williams, Dwivedi & Piercy (2015); Zainol Yahaya, Cheok & Wong (2015); Sawsen Lakhall, Hager Khechine, and Daniel Pascot (2013); Juinn and Tan (2013); Almatari, Iahad & Balaid (2013); Rahman, Jamaludin and Mahmud (2011); Sung, Jeong, Jeong, & Shin (2015); Nordin, Norman, & Embi (2015); San Martín & Herrero (2012).
H2	Effort expectancy and behavioral intention to use MOOCs	Miladinovic & Xiang (2016); Tan & Lau (2016); Nordin, Norman & Embi, (2015); Sung, Jeong, Jeong, & Shin, (2015); Sawsen Lakhall, Hager Khechine, and Daniel Pascot (2013); Thomas, Singh, and Gaffar (2013); Almatari, Iahad & Balaid (2013).
H3	Social Influence and behavioral intention to use MOOCs	Evon and Lau (2016); Tan & Lau (2016); Morosan and DeFranco (2016); Nordin, Norman, & Embi (2015); Sung, Jeong, Jeong, and Shin (2015); Sawsen Lakhall, Hager Khechine, and Daniel Pascot (2013); Juinn and Tan 2013; Thomas, Singh, and Gaffar (2013) Almatari, Iahad & Balaid (2013).
H4	Facilitating Condition and Behavioral Intention to use MOOCs	Sam & Baharin (2018); Venkatesh, Thong & Xu (2012); Nordin, Norman, and Embi (2015); Juinn and Tan (2013); Thomas, Singh, and Gaffar, (2013); Sawsen Lakhall, Hager Khechine, and Daniel Pascot (2013)

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Hypot hesis	Relationships	Authors/Relationships
H5	Absorptive Capacity and Behavioral Intention to use MOOCs	Garcia-Morales et al (2019); Scuotto, Del Giudice & Carayannis (2017); Mayeh, Ramayah & Mishra (2016); Ali & Park (2016), Arifin, Fontana, & Wijanto (2016) Huang, P., & Lucas, H. (2015), Arifin (2015)
H6	Perceived Autonomy and Behavioral intention to use MOOCs	Lan, & Hew, K. F. (2020); Ahearn et al., (2017); Sierens, Vansteenkiste, Goossens, Soenens & Dochy (2009); Yang (2014); Lakhali et al. (2013); Giesbrecht, Pfister, and Schwabe (2012); Chen, and Jang (2010)
H7	Moderating effect of Culture on Relationship between Independent variables and Behavioral Intention to Use MOOCs	Nordin, Norman & Embi, (2015); Sung, Jeong, Jeong, & Shin, (2015); Sawsen Lakhali, Hager Khechine, and Daniel Pascot (2013); Khechine, and Daniel Pascot (2013); Juinn and Tan 2013; Thomas, Singh, and Gaffar (2013) Almatari, Iahad & Balaid (2013)
H8	Effects of the independent variables on BI between the two countries?	Sierens, Vansteenkiste, Goossens, Soenens & Dochy (2009); Yang (2014); Lakhali et al. (2013); Nordin, Norman & Embi, (2015); Sung, Jeong, Jeong, & Shin, (2015); Sawsen Lakhali, Hager Khechine, and Daniel Pascot (2013)

2.13 Conceptual framework

From the analysis of the literature review, and the consultation of the concepts, theories, and models regarding the relationship between variables, the following conceptual framework was developed.

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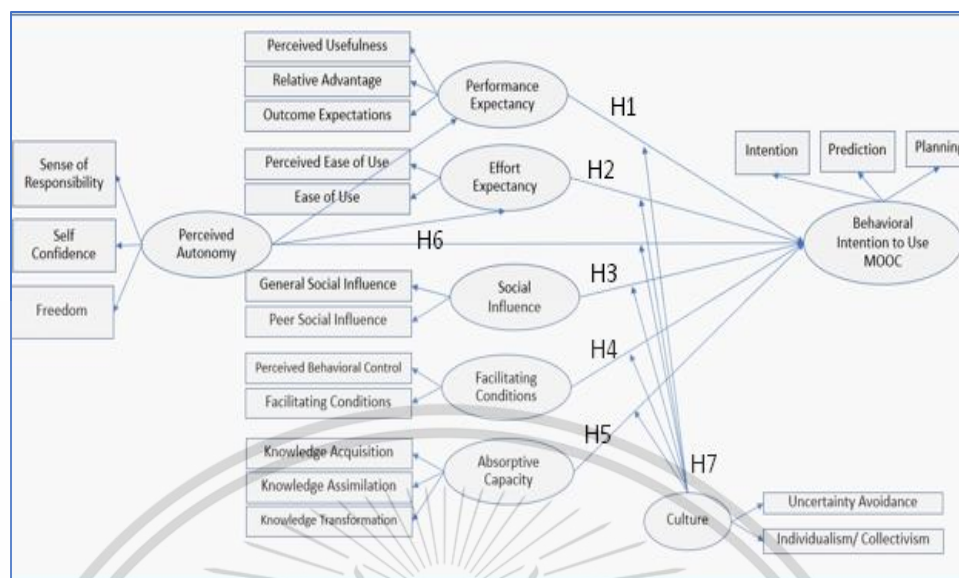


Figure 2.33. Conceptual framework of the study

The conceptual framework above shows that the dependent variable is behavioral intention to use MOOCs. In contrast, the independent variables include performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating condition (FC), Absorptive capacity (AC), and Perceived Autonomy (PA). From the above conceptual framework, the following hypothesis was developed.

H1: Performance Expectancy has a positive effect on Behavioral Intention to use MOOCs

H2: Effort Expectancy has a positive effect on Behavioral Intention to use MOOCs

H3: Social Influence has a positive effect on Behavioral Intention to use MOOCs

H4: Facilitating Conditions has a positive effect on Behavioral Intention to use MOOCs

H5: Absorptive Capacity has a positive effect on Behavioral Intention to use MOOCs

H6: Perceived Autonomy has a positive effect on Behavioral Intention to use MOOCs

H7: Culture moderates the effect of the independent variables (PE, EE, SI, FCS, AC, & PA) on Behavioral Intention to use MOOCs

H8: There is a difference in the effects of IV (PE, EE, SI, FCS, AC, & PA) on BI between the two countries

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CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The research on ‘The Integration of Perceived Autonomy, and Absorptive Capacity to UTAUT Model: An Empirical Investigation of Students’ Intention to Use MOOCs in Thailand and Pakistan’ aims to investigate the factors affecting the students’ intention to use the MOOCs in Thailand and Pakistan. The research was designed to adopt the adjusted UTAUT model by incorporating two variables, the perceived autonomy, and absorptive capacity. The quantitative approach was used to carry out the research study. With regard to quantitative research, the primary data was collected using questionnaires from a sample size of 1003 respondents. The structural equation model (SEM) was applied to analyze the data. The study was a quantitative, while the literature review was done from secondary sources. The secondary sources included, such as peer-reviewed journals, articles, books, and relevant dissertations. These sources were considered for gaining insights into each of the identified study variables and proposed hypotheses. The research was carried out as demonstrated below.

3.1 Quantitative Research

3.1.1 Population and samples

3.1.2 Sampling and sample size

3.1.3 Variables in the study

3.1.4 Research instruments and the scale

3.1.5 Quality of the instruments

3.1.6 Data collection methods

3.1.7 Data analysis

The quantitative approach was applied to carry out the research on the factors influencing the intention to use MOOCs in Thailand and Pakistan. The first approach involves collecting the data from the sample respondents using a questionnaire and then analyzed using the SEM technique to answer the research questions. The second approach, requires the previous research literature review, particularly credible articles on the same topic. This chapter presents the methodology that was adopted in conducting research, geared towards achieving the objectives and answering the research questions as stated in chapter one. The research procedure is presented in the following steps.

Step 1: This step involves the review of the relevant literature, theories, concepts, articles, online statistics, and academic papers, which helped in building this research study contention. It is an in-depth study, which helped in evaluating and selecting the study variables, identifying the research problem, and specifying the research gap. From the study, the research objectives and research questions were developed, which were answered, helping in solving the research problems identified and bridging the research gaps. This led to the development of the conceptual framework, which contains a total of 6 latent, 1 moderate, and 1 dependent variable and 20 observed variables.

Step 2: This step involved quantitative research. The data collected from the respondents were cleaned/filtered, tested for reliability, and, if satisfactory, an analysis was conducted. The analysis uses the structural equation model (SEM) via AMOS.

Step 3: This was started by secondary data research, where it involves collection of information, which could support the quantitative method from sources such as referred journals, articles, books, credible online sources, academic publications, and papers. The reviewing of the literature led to the identification of the research gap and the development of the research problem. This led to the development of the research objectives, questions, and hypotheses. The research framework was then be developed, and research instruments specified. The data was collected from the sample size designed by the population. The data was then analyzed, and the results were presented. The conclusions were made then referring to qualitative and quantitative research.

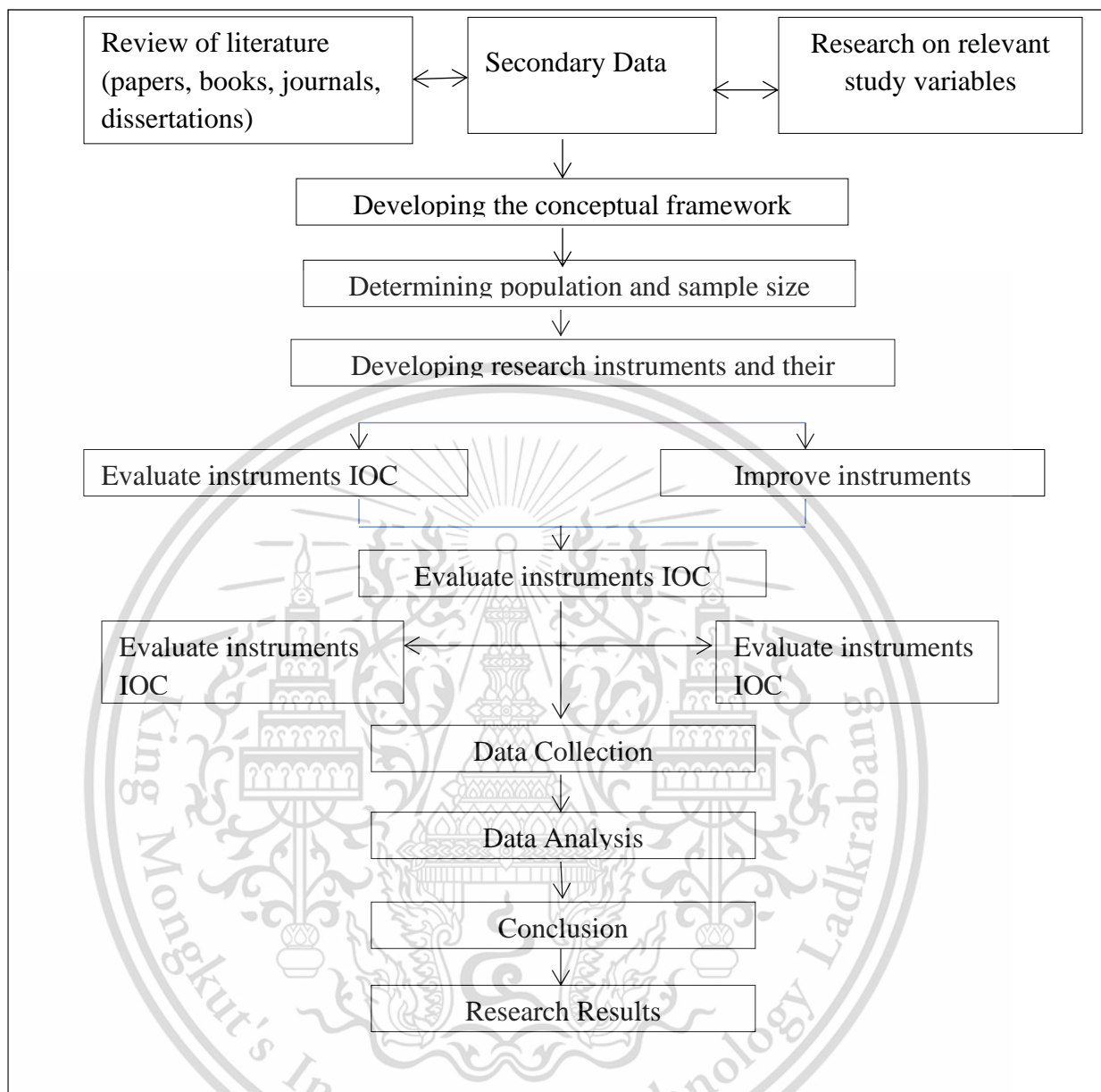


Figure 3.1. Process of Research Methodology

3.2 Quantitative Research

3.2.1 Population and Samples

Population

This research was aimed at investigating the factors affecting the adoption of MOOCs in Thailand and Pakistan, using the adjusted UTAUT model. Therefore, the

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population of the research was the students and professionals, who were intending to use MOOCs for studying different courses in Thailand and Pakistan. It also included the MOOCs teachers and lecturers who teach their courses through the MOOCs platforms. It comprised of the students who had enrolled or are planning to get enrolled in learning MOOCs. Pakistan report published by HOOTSUITE reports Jan 2020 has a Total Population of 218.7 Million and 76.38 million Internet users. Similarly, Thailand has been reported as 69.71 million population and 52 million internet users. Since this population is large, a representative sample was developed from which the data was collected.

3.2.2 Sample and Sampling Design and Technique

This study focused on investigating the factors that influenced the use of MOOCs in Pakistan and Thailand. The samples were students and professionals who were familiar with the use of the MOOCs in the two countries.

Sampling Design: The study has adopted the probability of random sampling design to develop samples from the population. The primary reason for using the probability sampling design was that it gives the subjects in the population an equal chance of being included in the study sample. As a result, it helped avoid bias when developing a study sample (Burger & Silima, 2006).

Sampling Technique: The sampling technique implies the procedure applied in retrieving the sample subjects from the target population (Burger & Silima, 2006). The stratified random sampling technique was applied in the study. The following steps were adopted:

Step 1: Setting the sample size

The sample size was selected based on the institutes teaching social sciences and information technology subjects. Hair et al. (2011) regard five respondents per variable to be analyzed as the lower limit, but the most acceptable way of determination is the 20:1 ratio (20 samples for one variable). Therefore, since the study has 20 observed variables, then the appropriate sample size was considered to be 400 (20*20 observed variables). However, after collecting the data and cleaning it, this research got a higher sample size

than the intended one for each country. The table below shows the intended sample size and the actual sample size that was used for each region of the study.

Table 3.1. Sample size and Regions

Region	Number of Respondents	Actual Sample Size Used
Thailand	400	490
Pakistan	400	513

Step 2: Dividing the regions into two sections, Thailand and Pakistan, each having a sample size of 400 according to the above determination, and the collected sample size was 490 for Thailand and 513 for Pakistan.

Step 3: The two countries were divided into five and four regions each, respectively.

- The regions for Thailand: North, South, Central, Eastern, and North East
- The region of Pakistan: North, West, South, and East Regions

The sample size of each country was divided equally among each country's regions. Then the sample size of each region was divided equally among the universities in the concerned region. The subjects from each university were collected randomly with each identified university

The regions, chosen universities in these regions and the sample sizes in each are summarized in the following tables.

Table 3.2. Thailand Regions and Universities

Areas	Provinces	Institutes	Sample Size
North	Chiangmai	Chiangmai University	46
North East	KhonKaen	Khonkaen University	46
Central	Bangkok	Chulalongkorn University	50
		Thammasat University	50
		Mae Fah Luang University	46
		KMUTT	51
		Mahidol	50
East	Chonburi	Burapha University	50
South	Songkhla	Prince of Songkhla University	50

Table 3.3. Pakistan Region and Universities

Areas	Provinces	Institutes	Sample Size
North	Peshawar	Ghulam Ishaq Khan Institute of Engineering Science and Technology	50
East	Punjab	Lahore University of Management and Science	52
South	Karachi	COMSAT University	50
		Institute of Business Administration	50
		Greenwich University	51
		Iqra University	52
		SZABIST	52
		Virtual University	53
West	Quetta	Bahria University	50
		University of Balochistan	53

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The primary data to be used in this research was collected using a structured questionnaire. The relationship between the variables was analyzed using the AMOS, where several analyses, such as correlation and descriptive statistics, were conducted. The SEM, which is the primary analysis of this research was performed. SEM will help in evaluating the relationship between the latent variables, the observed variables, and how the variables influence the behavioral intention to use MOOCs.

3.2.3 Variables in the Research

After conducting, evaluating, and reviewing the relevant concepts, literature review, theories, the study developed the latent and observational variables presented below.

1. Exogenous Latent Variables

1.1 Performance expectancy: consisted of 3 observed variables

- Perceived usefulness
- Relative advantage
- Outcome expectations

1.2 Effort expectancy: consisted of 2 observed variables

- Perceived Ease of Use
- Ease of use

1.3 Social influence: consisted of 2 observed variables

- General social influence
- Peer social influence

1.4 Facilitating conditions: consisted of 2 observed variables

- Perceived Behavioral Control
- Facilitating Conditions

1.5 Perceived Autonomy: consisted of 3 observed variables

- Sense of responsibility
- Self-confidence
- Freedom

1.6 Absorptive Capacity: consisted of 3 observed variables

- Knowledge acquisition
- Knowledge assimilation
- Knowledge transformation

2. The Moderating/Intervening Variables

2.1 Culture: consisted of 2 observed variables

- Uncertainty Avoidance
- Individualism/collectivism

3. Endogenous Latent Variables

3.1 Behavioral intention to use: which had 3 observed variables

- Intention
- Prediction
- Planning

The data was collected from the sample in Thailand and Pakistan using the structured questionnaire.

3.3 Research Instruments Development

1. The preparation of the research questionnaire was developed in reference to previous literature, theories, and researches conducted in a similar or most relevant setting.

2. The evaluated models, theories, concepts led to the development of the relationships between the endogenous variables, the exogenous variables, the mediating variables, and the observed variables.

3. The questionnaire, which was used to collect data, was compliant with the recommended structure. Five experts were consulted to evaluate the validity and reliability of the questionnaire, as well as find the item-objective congruence (IOC) of the questionnaire. IOC will help in evaluating the congruence among the questions included in the questionnaire and their ability to address the research objectives and questions. The expected level of acceptance is between 0.5 – 1.0 but is lower than 0.5, the questions will

have to be improved in order to fit for objectives and questions of study (Turner & Carlson, 2003).

4. The questionnaire/instrument was used in English language to collect the datasets because English is the official language in Pakistan; however, for Thailand, data was collected Thai language translated by a Thai native speaker with a strong research background to avoid any shortcomings. After the Translated version of questionnaire, revisions were incorporated by 3 IOC Experts, and certified by Dr. Singha Chaveesuk and Dr. Wornchanok Chaiyasoonthorn to ensure the translations are in perfect order.

5. The internal consistency or the reliability of the collected data was tested using Cronbach's alpha. This test is used when the questionnaire used in research has Likert questions. In this study, the focus is to determine whether the scale used is consistent and reliable.

3.3.1 The Structure of the Questionnaire and Instruments

The research was conducted based on a set of questionnaires. The questionnaire was developed on the basis of the reviewed previous literature, concepts, theories, and models, and in reference to the research questions. The questions were set to evaluate all the variables of the study, including performance expectancy, effort expectancy, social influence, facilitating conditions, perceived autonomy, absorptive capacity, culture, and behavioral intention to use.

The questionnaire was divided into four sections:

Part 1: Demographic Data – this section was collected the personal data of the respondents such as age, gender, educational level, occupation, salary, and current residence location. This was aimed to capture the demographic characteristics of the respondents

Part 2: Latent Variable Questions – this section contained questions, which evaluated the latent variables and their relationships. This section was developed in reference to the previous literature.

Part 3: 3.1 Behavioral Intention to use: the questions related to the behavioral intention to use was developed with reference to various researchers such as Yeop, Yaakob, Wong, Don, & Zain (2019), Tseng, Lin, Wang, and Liu (2019), Morales & Trinidad (2019), Chan et al., (2018), Joo, So, & Kim (2018), Tan & Lau (2016), Gao & Yang, (2015), Khechine, Lakhali, Pascot & Bytha (2014), Lakhali et al. (2013), Juinn & Tan (2013), Islam et al. (2013), Madigan, Louw, T., Dziennus, Graindorge, Ortega, Graindorge, & Merat (2016), Yi, Jackson, Park & Probst (2006), and Venkatesh et al.,(2003).

An example of a questionnaire related to Behavioral Intention to use is presented below.

Instruction: Please answer each of the following questions by ticking (√) in the blank spaces provided, that matches your opinion. The scale is classified into five levels as follows:

Table 3.4. Questions on behavioral intention to use

		Least → Most				
		1	2	3	4	5
The variable 'Behavioral Intention to Use' implies the individual's intention to perform an act, which could predict a given behavior when an individual act voluntarily.						
<u>Intention</u>	I intent to use MOOCs immediately.					
	I intend to use MOOCs in the future learning sessions					

<p>I intend to utilize MOOCs for various purposes such as self-development as well as earning credit hours</p> <p>If MOOCs become more diverse in the future, I intend to use it frequently after graduation</p>	<ul style="list-style-type: none"> - Lakhali et al., (2013) - Venkatesh et al., (2012). - Yi, Jackson, Park & Probst (2006) - Venkatesh et al., (2003). 					
<p><u>Prediction</u></p> <p>I predict I will use MOOCs immediately.</p> <p>I predict I would use MOOCs in future learning sessions</p>						
<p>I predict I will utilize for various purposes such as self-development as well as earning credit hours</p>						
<p>If MOOCs become more diverse in the future, I predict I will use them frequently after graduation</p>						
<p><u>Planning</u></p> <p>I plan to use MOOCs immediately.</p> <p>I plan to use MOOCs in future learning sessions.</p>						
<p>I plan to utilize MOOCs for various purposes such as self-development as well as earning credit hours</p>						

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If MOOCs become more diverse in the future, I plan to use them frequently after graduation						
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Part 3: 3.2 Performance Expectancy: the questions for this variable were developed into a questionnaire with reference to various researchers such as Gupta & Dogra (2017), Tan & Lau (2016), Slade, Williams, Dwivedi & Piercy (2015), Zainol Yahaya, Yahaya, and Zain (2017), Sung, Jeong, Jeong, & Shin, (2015), Nordin, Norman, & Embi, (2015), Sawsen Lakhal, Hager Khechine, and Daniel Pascot (2013), Juinn and Tan (2013), Almatari, Iahad & Balaid (2013), San Martín & Herrero (2012), Venkatesh et al., (2012), Rahman, Jamaludin and Mahmud (2011), Venkatesh et al., (2003).

Instruction: Please answer each of the following questions by ticking (√) in the blank spaces provided that match your opinion. The scale was classified into five levels as follows:

Table 3.5. Questions on performance expectancy

		Least → Most				
		1	2	3	4	5
<p>Perceived Usefulness</p> <p>Using MOOCs enables me to accomplish my learning activities more quickly</p>	- Gupta and Dogra (2017)					
	- Tan and Lau (2016)					
	- Slade et al., (2015)					

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Using MOOCs improves my learning performance (i.e., develop new skills, techniques, and gain experience)	<ul style="list-style-type: none"> - Zainol et al., (2015) - Sung et al., (2015) 					
Using MOOCs increases productivity in my learning activities (i.e., able to learn and understand a large amount of information)	<ul style="list-style-type: none"> - Nordin, et al., (2015) - Lakhali et al., (2013) - Juinn and Tan (2013) 					
Using MOOCs enhances my effectiveness in my learning activities (i.e., gain comprehensive knowledge and greater understanding about course being studied for improving grades and academic performance)	<ul style="list-style-type: none"> - Almatari et al., (2013) - San Martín & Herrero (2012) - Rahman et al., (2011) - Venkatesh et al., (2003) 					
Using MOOCs would make it easier to complete my courses and modules faster.						
I would find MOOCs useful in my learning activities.						
<p><u>Relative Advantage</u></p> <p>Using MOOCs enables me to learn more quickly as compared to traditional classroom.</p>						
Using MOOCs improves the quality of my learning activities						

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(i.e., to achieve better grades and improve academic performance)					
<u>Outcome Expectation</u>					
If I use MOOCs, I will increase the chances of getting higher marks on test and exams for the same amount of effort.					
If I use MOOCs, my classmates will perceive me as competent					
If I use MOOCs, I will increase my chances of advancing to the next level					

Part 3: 3.3 Effort Expectancy: the questions related to the effort expectancy were developed and used to inform the research questionnaire. These questions were developed with reference to various researchers such as Miadinovic and Xiang (2016), Tan & Lau (2016), Nordin, Norman & Embi, (2015), Sung, Jeong, Jeong, & Shin, (2015), Sawsen Lakhal, Hager Khechine, and Daniel Pascot (2013), Thomas, Singh, and Gaffar (2013), Almatari, Iahad & Balaid (2013), Venkatesh et al., (2012), Venkatesh et al., (2003).

Instruction: Please answer each of the following questions by ticking (√) in the blank spaces provided, that matches your opinion. The scale is classified into five levels as follows:

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Table 3.6. Questions on Effort expectancy variable

Question	Researcher	Least → Most				
		1	2	3	4	5
<u>Perceived Ease of Use</u>						
Learning to operate MOOCs would be easy for me						
My interaction with MOOCs would be clear and understandable	- Miladinovic and Xiang (2016) - Tan and Lau (2016) - Nordin et al., (2015)					
I find MOOCs to be flexible to interact with	- Sung et al., (2015) - Lakhali et al., (2013)					
It is easy for me to become skillful at using MOOCs	- Thomas et al., (2013) - Almatari et al., (2013) - Venkatesh et al., (2012)					
<u>Ease of Use</u>						
I believe I require little effort to understand how MOOCs works	- Venkatesh et al., (2003)					
Overall, I believe that the MOOCs is easy to use						

Part 3: 3.4 Social Influence: the social influence questions included in the questionnaire were developed with reference to various researchers, which include Evon and Lau (2016), Tan & Lau (2016), Morosan and DeFranco (2016), Nordin, Norman, & Embi (2015), Sung, Jeong, Jeong, & Shin, (2015), Lakhali et al. (2013), Juinn & Tan (2013),

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Thomas, Singh, & Gaffar, (2013), Almatari, Iahad & Balaid (2013), Venkatesh et al., (2012), Jeng and Tzeng (2012), Venkatesh et al., (2003), Ajzen, (1991).

Instruction: Please answer each of the following questions by ticking (√) in the blank spaces provided, that match your opinion. The scale is classified into five levels as follows:

Table 3.7 Questions on Social Influence variable

The variable 'Social Influence' A person's perception that most people who are important to him think he should or should not perform the behavior in question		Least → Most				
Question	Researcher	1	2	3	4	5
<u>General Social Influence</u>	- Evon and Lau (2016) - Tan and Lau (2016) - Morosan and DeFranco (2016) - Nordin et al., (2015)					
People who influence my behavior think that I should use MOOCs						
People who are important to me think I should MOOCs	- Sung et al., (2015) - Lakhal et al., (2013) - Juinn and Tan (2013)					
My learning institution supports the use of MOOCs	- Thomas et al., (2013) - Almatari et al., (2013)					
<u>Peer Social Influence</u>	- Venkatesh et al., (2012) - Jeng and Tzeng (2012) - Venkatesh et al., (2003) - Ajzen, (1991)					
Learner's who use MOOCs enjoy more prestige than those who do not						
Learner's who use MOOCs have a high profile						

My peers and teacher think that I should use MOOCs						
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Part 3: 3.5 Facilitating Conditions: the facilitating conditions were included in the questionnaire to investigate the variables, with references to the various researchers such as Sam & Baharin (2018), Thomas, Nordin, Norman & Embi, (2015), Juinn & Tan (2013), Singh, & Gaffar (2013), Lakhali et al. (2013), Venkatesh, Thong & Xu (2012), Venkatesh et al., (2003).

Instruction: Please answer each of the following questions by ticking (√) in the blank spaces provided, that matches your opinion. The scale is classified into five levels as follows:

Table 3.8. Questions on facilitating condition variable

Question	Researcher	Least → Most				
		1	2	3	4	5
<u>Perceived Behavioral Control</u>						
I have necessary resources to use MOOCs	- Sam & Baharin (2018) - Nordin, Norman, and Embi (2015)					
I have the necessary knowledge to use MOOCs systems.	- Juinn & Tan (2013) - Thomas et al., (2013) - Lakhali et al., (2013)					
I have the knowledge necessary to use the MOOCs.	- Venkatesh et al., (2012) - Venkatesh et al., (2003)					

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<p><u>Facilitating Conditions</u></p> <p>Guidance is available to me in the selection of MOOCs.</p>						
<p>Specialized instruction concerning the MOOCs was available to me.</p>						
<p>I get the support from a specific person/group when I face difficulties with MOOCs.</p>						
<p>Using MOOCs fits my learning style.</p>						

Part 3: 3.6 Absorptive Capacity: the questions on the absorptive capacity variable were included in the questionnaire. The questions were based on the research of others such as Garcia-Morales et al. (2019), Scuotto, Del Giudice & Carayannis (2017), Mayeh, Ramayah & Mishra, (2016), Ali, & Park, (2016), Arifin, Fontana, & Wijanto (2016), Huang, P., & Lucas, H. (2015), Arifin (2015).

Instruction: Please answer each of the following questions by ticking (√) in the blank spaces provided, that match your opinion. The scale is classified into five levels as follows:

Table 3.9. Questions on Absorptive Capacity Variable

The variable ‘Absorptive capacity’ implies the ability to locate and apply new ideas, technology, and innovation and incorporate them within the organizational process

Question	Researcher	Least → Most				
		1	2	3	4	5
<u>Knowledge Acquisition</u>	- Garcia-Morales et al., (2019)					
I am able to generate an environment of trust using MOOCs	- Scuotto et al., (2017)					
I am able to acquire information using MOOCs for my learning activities.	- Mayeh et al., (2016)					
I am able to obtain the latest knowledge in education-related issues using MOOCs	- Ali and Park (2016) - Arifin et al., (2016)					
<u>Knowledge Assimilation</u>	- Huang et al., (2015)					
I am able to learn through interactive discussions forum using MOOCs	- Arifin (2015)					
I am able to communicate my ideas regularly using MOOCs						
I am able to assimilate research and education related issues using MOOCs.						
<u>Knowledge Transformation</u>						
I am able to share important knowledge using MOOCs						

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MOOCs make it easier to share knowledge						
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Part 3: 3.7 Perceived Autonomy: the perceived autonomy was critical, and questions were included in the questionnaire. The questions were based on the research conducted by others such as Lan, & Hew, K. F. (2020), Ahearn et al., (2017), Sierens, Vansteenkiste, Goossens, Soenens & Dochy (2009), Yang (2014); Lakhali et al. (2013); Giesbrecht, Pfister, and Schwabe (2012); Chen, and Jang (2010).

Instruction: Please answer each of the following questions by ticking (√) in the blank spaces provided, that matches your opinion. The scale is classified into five levels as follows:

Table 3.10. Questions on perceived autonomy

The variable ‘Perceived Autonomy’ implies the extent to which an individual feels that he/she can exercise the freedom of choice in terms of MOOCs learning.		Least → Most				
Question	Researcher	1	2	3	4	5
<u>Sense of Responsibility</u> I have good study habits and time management using MOOCs.	- Lan et al., (2020) - Ahearn et al., (2017) - Sierens et al., (2009) - Yang (2014)					
I have autonomous work habits using MOOCs.	- Lakhali et al. (2013) - Giesbrecht et al., (2012)					
I have a great sense of personal responsibility for using MOOCs.	- Chen and Jang (2010)					

<p><u>Self-Confidence</u></p> <p>I feel confident in my ability to learn using MOOCs</p>						
<p>I show initiative and judgment in carrying out my learning activities when using MOOCs.</p>						
<p><u>Freedom</u></p> <p>Using MOOCs gives me learning freedom.</p>						
<p>I usually feel free to make my own decisions using MOOCs</p>						
<p>Using MOOCs, I can decide which activities I want to learn at a time that is appropriate for me.</p>						

Part 3: 3.8 Culture: the culture as a moderating variable was critical, and questions were included in the questionnaire. In this study, two of the cultural dimensions were used. This includes individualism/collectivism and uncertainty avoidance. These are selected as representative of culture moderating variables because they are related to the aspect of technology adoption. Individualism/collectivism will evaluate the extent to which an individual prefers to settle their own needs rather than the group's needs in relation to MOOCs. The uncertainty avoidance dimension was evaluated the extent to which a person is willing to take up the risk of adopting the new technology, MOOCs learning in this case. The questions were based on the research conducted by others such as Jung & Lee (2019), Yavwa & Twinomurinzi (2018), Pinpathomrat, N. (2017), Rabaa'i (2017), Im et al. (2011), Yoo et al. (2011), Srite 2006.

Instruction: Please answer each of the following questions by ticking (√) in the blank spaces provided, that match your opinion. The scale is classified into five levels as follows:

Table 3.11. Questions on culture as a moderating variable

The variable moderating variable ‘Culture’ implies the collective programming of the mind, which distinguishes the members of a particular group from the others.

Question	Researcher	Least → Most				
		1	2	3	4	5
<p>Individualism/ Collectivism</p> <p>I get better learning results when I study as a MOOC group member than when I study independently on my own</p>	<ul style="list-style-type: none"> - Jung & Lee (2019) - Yavwa & Twinomurinsi (2018) - Pinpathomrat, N. (2017) 					
<p>Group success is more important than individual success while studying MOOCs</p>	<ul style="list-style-type: none"> - Rabaa'i (2017). - Im et al. (2011), - Yoo et al. (2011), - Srite 2006 					
<p>Group loyalty should be encouraged even if individual goals suffer while studying MOOCs</p> <p>Uncertainty Avoidance</p> <p>Studying MOOCs, rules, and regulations are important because they inform me what is expected of me</p>						

Studying the order and structure of MOOCs learning modules is important					
It is important to have detailed learning outcomes in details so that I always know what I am expected to study					
It is important to follow MOOCs instructions and procedures closely					
Standardized work procedures are helpful when studying with MOOCs					
Learners should avoid shift to using MOOCs because it is better learning tool					

Part 4: Suggestions of Respondent

The questionnaire used for the study was structured as shown in the table below

Table 3.12. Structure of the study questionnaire

Variable	Total Questions	Question Number	Form / Scale
Part 1: Demographic Data	5	-	Nominal scale
Part 2: Latent Variable Questions	66	-	
3.2 Performance Expectancy		1-11	
3.2.1 Perceived usefulness	6		
3.2.2 Relative advantage	2		
3.2.3 Outcome expectations	3		

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Variable	Total Questions	Question Number	Form / Scale
3.3 Effort expectancy		12-17	Likert Scale
3.3.1 Perceived Ease of use	4		
3.3.2 Ease of use	2		
3.4 Social influence		18-23	
3.4.1 General social influence	3		
3.4.2 Peer social influence	3		
3.5 Facilitating conditions:		24-29	
3.5.1 Perceived Behavioral Control	2		
3.5.2 Facilitating Conditions	4		
3.9 Behavioral intention to use:		30-41	
3.8.1 Intention	4		
3.8.2 Prediction	4		
3.8.3 Planning	4		
3.7 Absorptive Capacity		42-49	
3.7.1 Knowledge acquisition	3		
3.7.2 Knowledge assimilation	3		
3.7.3 Knowledge transformation	2		
3.8 Perceived Autonomy		50-57	
3.8.1 Sense of Responsibility	3		
3.8.2 Self Confidence	2		
3.8.3 Freedom	3		
3.10 Culture		58-66	
3.9.1 Uncertainty Avoidance	3		
3.9.2 Individualism/collectivism	6		

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3.3.2 Scale Development

The questionnaire was developed in relation to the research questions and in reference to the conceptual framework. The literature review was also consulted to inform the items designed for each observed variable. The scale development of the latent and observed variables is presented in the following table.

Table 3.13. Scale development table

Latent Variables	Observed Variables	Development of Research Variables	Number of Questions
Performance Expectancy	<ul style="list-style-type: none"> - Perceived usefulness - Relative advantage - Outcome expectations 	Gupta & Dogra (2017), Tan & Lau (2016), Slade, Williams, Dwivedi & Piercy (2015), Zainol Yahaya, Yahaya, and Zain (2017), Sung, Jeong, Jeong, & Shin, (2015), Nordin, Norman, & Embi, (2015), Sawsen Lakhal, Hager Khechine, and Daniel Pascot (2013), Juinn and Tan (2013), Almatari, Iahad & Balaid (2013), San Martín & Herrero (2012), Venkatesh et al., (2012), Rahman, Jamaludin and Mahmud (2011), Venkatesh et al., (2003).	11
Effort expectancy	<ul style="list-style-type: none"> - Perceived Ease of use - Ease of use 	Miadinovic and Xiang (2016), Tan & Lau (2016), Nordin, Norman & Embi, (2015), Sung, Jeong, Jeong, & Shin, (2015), Sawsen Lakhal, Hager Khechine, and Daniel Pascot (2013), Thomas, Singh, and Gaffar (2013), Almatari, Iahad &	6

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Latent Variables	Observed Variables	Development of Research Variables	Number of Questions
		Balaid (2013), Venkatesh et al., (2012), Venkatesh et al., (2003).	
Social influence	<ul style="list-style-type: none"> - General social influence - Peer social influence 	Evon and Lau (2016), Tan & Lau (2016), Morosan and DeFranco (2016), Nordin, Norman, & Embi (2015), Sung, Jeong, Jeong, & Shin, (2015), Lakhali et al. (2013), Juinn & Tan (2013), Thomas, Singh, & Gaffar, (2013), Almatari, Iahad & Balaid (2013), Venkatesh et al , (2012), Jeng and Tzeng (2012), Venkatesh et al., (2003), Ajzen, (1991).	6
Facilitating conditions:	<ul style="list-style-type: none"> - Perceived Behavioral Control - Facilitating Conditions 	Sam & Baharin (2018), Thomas, Nordin, Norman & Embi, (2015), Juinn & Tan (2013), Singh, & Gaffar (2013), Lakhali et al. (2013), Venkatesh, Thong & Xu (2012), Ventakesh et al., (2003).	6
Absorptive Capacity	<ul style="list-style-type: none"> - Knowledge acquisition - Knowledge assimilation - Knowledge transformation 	Garcia-Morales et al (2019), Scuotto, Del Giudice & Carayannis (2017), Mayeh, Ramayah & Mishra, (2016), Ali, & Park, (2016), Arifin, Fontana, & Wijanto (2016), Huang, P., & Lucas, H. (2015), Arifin (2015).	8

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Latent Variables	Observed Variables	Development of Research Variables	Number of Questions
Perceived Autonomy	<ul style="list-style-type: none"> - Sense of responsibility - Self Confidence - Freedom 	Lan, & Hew, K. F. (2020), Ahearn et al., (2017), Sierens, Vansteenkiste, Goossens, Soenens & Dochy (2009), Yang (2014); Lakhali et al. (2013); Giesbrecht, Pfister, and Schwabe (2012); Chen, and Jang (2010).	8
Behavioral intention to use:	<ul style="list-style-type: none"> - Intention - Prediction - Planning 	Yeop, Yaakob, Wong, Don, & Zain (2019), Tseng, Lin, Wang, and Liu (2019), Morales & Trinidad (2019), Chan et al., (2018), Joo, So, & Kim (2018), Tan & Lau (2016), Gao & Yang, (2015), Khechine, Lakhali, Pascot & Bytha (2014), Lakhali et al. (2013), Juinn & Tan (2013), Islam et al, (2013), Madigan, Louw, T., Dziennus, Graindorge, Ortega, Graindorge, & Merat (2016), Yi, Jackson, Park & Probst (2006), and Venkatesh et al.,(2003).	12
Culture	<ul style="list-style-type: none"> - Uncertainty Avoidance - Individualism/ Collectivism 	Jung & Lee (2019), Yavwa & Twinomurizi (2018), Pinpathomrat, N. (2017), Rabaa'i (2017), Im et al. (2011), Yoo et al. (2011), Srite 2006.	9

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The analysis data were obtained from the questions, which were designed with a 5-point rating scale (5-point Likert Scale) was set. These questions were developed with reference to the previous literature and other academicians. In the Likert scale, the 5-point scale was containing the following components:

- ‘5’ – Strongly Agree
- ‘4’ – Agree
- ‘3’ – Neutral (Neither Agree nor Disagree)
- ‘2’ – Disagree
- ‘1’ – Strongly Disagree

These sets of questions were set as exclusion. Hence the points obtained were arranged in contrast to the above ones. As a result, the interpretation of the high scales was based on the class intervals, which were obtained as follows.

$$\begin{aligned} \text{Class Interval} &= (\text{Maximum} - \text{minimum}) / (\text{Number of Classes}) \\ &= (5-1) / 5 = 0.80 \end{aligned}$$

The above calculation shows that the distance between was 0.80, which was applied in developing the evaluation criteria which is presented in the table below.

Table 3.14. The Variable Explanation Criteria

Level of Average Point	Influence/Behavior	Level of Variable
4.24 – 5.00	Strongly Agree	Strongly Agree
3.43 – 4.23	Agree	Agree
2.62 – 3.42	Neutral	Neutral
1.81 – 2.61	Dissatisfied	Disagree
1.00 – 1.80	Strongly Disagree	Strongly Disagree

3.4 Quality of Instruments

It was important to evaluate whether the instrument used to collect data for the research was in quality standard. To check the quality standard of the instruments, its validity and reliability status was evaluated as discussed in the following sections.

Validity of the Instruments

To evaluate the validity of the instruments, the Item of Congruence (IOC) was used. A team of 5 experts, as academicians and executives, who have used MOOCs were asked to evaluate whether the questions were appropriate, and whether any improvements were important. In addition to this evaluation, there was the instrument calculation for the IOC between each question and variables. The questions, which had an IOC greater than 0.5 were considered appropriate. The calculation process is presented below.

$$IOC = \frac{\sum R}{N}$$

Where: R = Congruence value of each Question

N = the number of experts

1 = Congruent

0 = Uncertainty

-1 = Incongruent

The IOC ranges from -1 to +1. Hence, a question was considered good the closer it is to +1. The questions having an IOC, which is less than 0.6, were revised. Those with IOC less than 0.5 were excluded from the questionnaire (Turner & Carlson, 2003). The range of IOC included:

+1 = the questions were found to be congruent with the content

0 = the questions are uncertain if the questions would be congruent with the content

-1 = the questions are found to be incongruent with the content

The consideration criteria for the IOC were as follows:

1. Questions having IOC between 0.5 – 1.00 = Valid and can be used

2. Questions with IOC below 0.5 = To be revised

To assure the consistency and validity of the instrument, the questionnaire was assessed by two professors and one expert who has an abundance of knowledge and experience in terms of Information systems and technology to consider and review whether all details were simple to comprehend and meet the points or not. Firstly, Dr. Vasu Keerativutisest, specialized in research related to technology management. Secondly, Dr. Apichaya Nimkoompai who has skillful and expert in the area of Digital Disruption and Business Management. Thirdly, Dr. Paneepan Sombat specializes in eLearning and business management domain. Lastly, Mr. Michal Herzog and Mrs. Divona Herzog are the business entrepreneurs and owners of eLearning courses website Essential Skills Group, Inc., registered in Canada and have the number of local and international clients. The total score and IOC index is presented in Appendix C. Generally, all the items in the questionnaire gave a score above 0.5 except Item 4 “Using MOOCs enhances effectiveness in my learning activities (i.e., Gain comprehensive knowledge and greater understanding about course being studied for improving grades and academic performance); Item 13 “My interaction with MOOCs is clear and understandable”, Item 19 “People who are important to me think I should use MOOCs”; and Item 30 “I intend to use MOOCs immediately”. These four Items had an IOC below 5.0 and were revised based on experts’ comments. After revision, the instruments were given back to them for re-evaluation. After the second assessment, all the items got an IOC index greater than 5.0 and were considered suitable for the survey.

Reliability of the Instruments

To evaluate the reliability of the instrument, the Cronbach’s alpha was calculated to evaluate the entire questionnaire. Cronbach’s alpha greater than 0.7 was considered acceptable (Gliem & Gliem, 2003). Cronbach’s alpha was evaluated using the following criteria.

Table 3.15. Cronbach's Alpha Criteria

Cronbach's Alpha	External Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Gliem & Gliem, (2003)

The formula for developing the Cronbach's alpha is presented by (Gliem & Gliem, 2003). The coefficient of alpha ranges from 0 – 1 were, as presented in the above criteria, the higher the Cronbach's alpha, the better the reliability of the questions. The calculations are presented below:

$$\alpha = \frac{K}{K - 1} \left[1 - \frac{\sum S_i^2}{S_t^2} \right]$$

Where:

α = Reliability coefficient

k = the number of questions of the instrument

S_i^2 = Variance of score in each question

S_t^2 = Variance of total score of all respondents

In the interpretation of results, the Cronbach's alpha coefficient would be considered acceptable if it is above 0.70. However, if it is below 0.7, it would be necessary to re-evaluate the questions of the questionnaire.

To check the accuracy and internal consistency of the instruments, two tests were conducted; first with a pilot study sample (n = 30) and the actual data for Thailand, (n = 490) and for Pakistan (n = 513). The researcher used SPSS version 26 to conduct Cronbach's tests, and the results were 0.983, which was above 0.70 (See table 3.16 below). The questionnaire, according to Cronbach (1951), was excellently reliable.

Table 3.16. Cronbach's Alpha from a Pilot Study (n = 30)

Case Processing Summary			
		n	%
Cases	Valid	30	100.0
	Excluded ^a	0	0.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	
0.983	0.983	66	

Based on the validity and reliability analysis presented above, it was conclusive that the questionnaire instrument was suitable to conduct the current study. Therefore, the questionnaire was used to collect data for the study in Thailand and Pakistan. The final questionnaire is presented in Appendix B.

3.5 Data Collection

3.5.1 Quantitative Data Collection

The following procedure was adopted in the data collection process.

Primary Data

1. This first section was involve getting authentication and consent from the concerned stakeholders. The first consent was obtained from the head of the Ph.D. program. Asst. Prof. Dr. Singha Chaveesuk, in industrial business administration and from the vice dean of the academic and research department, who is in charge of graduate degree programs at KMITL university. The second consent was obtained from the organizations

and educational institutions from where the data was collected. The management of educational institutions and various organizations were consulted to give their approval to conduct the MOOCs research on their employees and staff.

2. The second step after getting the relevant permission to collect data was sending the link of questionnaires to the chosen sample. All the respondents were asked to fill out their respective responses in the online questionnaire.

3. The third section involved the examination and evaluation of the completeness of the questionnaire, followed by the actual data collection and its later analysis.

Secondary Data

The secondary data involved the data collected from various sources covering concepts, theories, literature, academicians, books, statistical data, journals and articles, and other publications by national and international researchers. The data collected from secondary sources were used to develop the study, research objectives, and hypothesis, as well as comparing the results of the data analysis in the discussion sections.

3.6 Data Analysis

3.6.1 Quantitative Data Analysis

After the questionnaires were received from all the respondents, they were analyzed to evaluate their correctness, validity, and reliability. This involved the removal of the missing data, checking for the outliers and removing them, and any values, which seem not to align with the rest of the data. The study applied a level of significance of 5%, which implies that the statistical alpha $\alpha = 0.05$. The following analysis procedure was adopted:

1) The first analysis was the calculation of the **descriptive statistics**. The descriptive statistics involved calculating characteristics of the variables used in the data, such as mean, mode, median, standard deviation, percentiles, skewness, kurtosis, maximum and minimum values. The purpose of conducting the descriptive analysis was to understand the characteristic behavior of the data before engaging in deep statistical analysis. The descriptive statistics were conducted for both the Thailand and Pakistan groups

2) The second analysis of the data was carried out with the **diagnostic tests**. The diagnostic tests were conducted to determine the statistical soundness of the data. Some of the diagnostic tests included:

a) **Normality Test** – which is based on Greene (2008), who argued that the error terms of a liner regression should be normally distributed. The normality tests were conducted using Skewness and Kurtosis following Hooland (1998).

3) The third analysis was **correlation analysis**. Pearson’s Correlation Analysis was conducted to evaluate the correlation between and among the study variables. This was a basic analysis in the structural equation modeling (SEM) analysis of finding factors that influence the behavioral intention to use MOOCs in Thailand and Pakistan. The correlation analysis consideration criteria are presented below:

Table 3.17 Levels of the Correlation coefficient

Correlation Coefficient (r)	Levels of relationships
$r > 0.8$	Very high
$0.6 < r < 0.8$	Quite high
$0.4 < r < 0.6$	Moderate
$0.2 < r < 0.4$	Quite low
$r < 0.2$	Low

Source: Akram, Ajmal & Munir (2008)

4) The other section analysis was to evaluate the congruence of the applied conceptual framework of the “Factors influencing the behavioral intention use MOOCs in Thailand and Pakistan, under the use of extended UTAUT model”, AMOS was used in carrying out the analysis.

3.6.2 Statistics for Analysis

Objectives Analysis

This section illustrates the statistical techniques that was applied in the analysis of each of the research objectives.

- For Objective 1, which empirically investigated the effects of behavioral intention to use MOOCs in Thailand and Pakistan, the structural equation model (SEM) was used to conduct the analysis.
- For Objective 2, which was to empirically determine the moderation effect of culture on behavioral intention to use MOOCs in Thailand and Pakistan, the SEM analysis with culture as a moderator variable was used.
- For Objective 3, which was to compare the results of Thailand and Pakistan on multigroup analysis on behavioral intention to use MOOCs in Thailand and Pakistan, the multigroup SEM analysis was used.
- For Objective 4, which was to develop a technology acceptance model for the behavioral intention to use MOOCs in Thailand and Pakistan, the combination of the SEM, moderated SEM and multi-group SEM was applied to develop and analyze the model.

To answer the first research question of “What are the factors influencing the behavioral intention to use MOOCs in Thailand and Pakistan?” the structural equation modeling (SEM) was applied. To answer the second research question, “What is the difference between Thailand and Pakistan in terms of factors influencing the behavioral intention to use MOOCs?” the SEM multi-group analysis was applied. The details are given in the following section.

Confirmatory Factor Analysis (CFA)

The confirmatory Factor Analysis (CFA) was applied to examine the model fitness and accuracy of the scale in terms of the relationship between the latent variables, observed variables, mediating variables, and endogenous variables. The statistical analysis involved the covariance analysis on the variance analysis of all the variables to be used in the overall study, which is in compliance with the SEM to confirm its accuracy and completeness. The covariance analysis was applied to the observed variables, latent variables, endogenous variables, and mediating variables. The congruence evaluation between the empirical data and the conceptual framework to be also conducted. The fit indices details are presented in the following table.

Table 3.18. Congruence Evaluation Table between the conceptual framework and empirical data

Statistics	Symbol	Objectives	Statistics showing congruence between empirical data and conceptual framework
Relative Chi-square	X^2/df	To test the congruence of empirical data and conceptual framework	$X^2/df < 5.00$
Goodness of Fit Index	GFI	To measure GFI, between 0-1.00	>0.90
Comparative Fit Index	CFI	To Compares the fit of a target model to the fit of an independent, or null, model	>0.90
Normed Fit Index	NFI	Measures NFI between 0 and 1	>0.90
Tucker Lewis index	TLI	To measure TLI, between 0-1.00	>0.90
Root mean square of approximation	RMSEA	To show conceptual framework errors in for of RMSEA between 0-100	<0.05

Source: Wheaton, Muthen, Alwin & Summers, (1977)

The structural Equation Modeling (SEM)

The structural equation modeling (SEM) was applied to evaluate the main objectives of the study - students' behavioral intention to Use MOOCs by incorporating the Integration of Perceived Autonomy and Absorptive Capacity to UTAUT. SEM is a quantitative research technique, which is suitable for showing the causal relationships among the study variables. The analysis is usually based on the study hypothesis. In SEM, three major analyses were carried out:

- i) The first analysis involved evaluating the latent variables (effects of independent variables on the dependent variables) guided by the stated hypothesis. This analysis was conducted for both Thailand and Pakistan data separately.

- ii) The second analysis evaluated the effects of the moderating variable (culture) on the relationship between the latent independent variables and the latent dependent variable(s). This analysis was conducted for both Thailand and Pakistan data separately.
- iii) The third objective was a multi-group SEM analysis, which compared the statistics of the two countries (Thailand and Pakistan). Multi-group analysis evaluated whether there was a difference between Thailand and Pakistan in terms of the relationship between independent and variables of the study.

Multi-group Analysis

Multi-group structural equation modeling (SEM) is an analytical technique that evaluate the invariance between two groups. The basic assumption of multi-group SEM analysis is that the two sample groups are independent. For this study, the multi-group analysis focused on evaluating whether the factors influencing the use of MOOCs in Thailand and Pakistan were different or not. Therefore, two groups were compared, where group 1 (Thailand) has a sample size of 490 respondents while group 2 (Pakistan) had a sample of 513 respondents. To run the analysis, the Chi-square difference technique was adopted. The first step was to run the whole SEM for the two groups and identify the significant and insignificant paths for each group. The insignificant paths for both countries were trimmed to get the unconstrained model and the associated Chi-square value, degrees of freedom statistics are recorded. To get the constraint model, the parameters were named to assume that they were equal for both groups. The difference between Chi-square and degrees of freedom for both groups (Thailand and Pakistan) were calculated and used to evaluate whether the two groups are invariant.

As recommended by Holmbeck (1997), the two-moderation analysis was conducted using the Structural Equation Modelling (SEM). While moderations effects are generally conducted using regression analysis and interaction terms, SEM was considered suitable for examining the moderation effects because it minimizes the impact of compounded measurement error, occurring when the independent variable and moderator are multiplied to create an interaction term (Holmbeck, 1997; Jaccard & Wan, 1996; Peyrot, 1996, Ping, 1996) minimizes the impact of compounded measurement error, occurring

when the independent variable and moderator are multiplied to create an interaction term (Holmbeck, 1997; Jaccard & Wan, 1996; Peyrot, 1996, Ping, 1996).

Amos version 26 was applied to conduct the statistical analysis.

3.7 Secondary Research

After conducting the quantitative data analysis, it was important to conduct also secondary research analysis as a way of confirming the findings of the quantitative analysis. The qualitative analysis relied purely on secondary data obtained from previous studies, which are related to the topic of study. These sources include books, articles from refereed journals, academic publications, statistical data, and other sources. These sources were used to set the research objectives, research questions, and research hypotheses.

3.8 Ethical Considerations

In this study, ethical consideration was a critical aspect from the start to the end of the research. First, the researcher sought all the relevant and required permission from concerned institutions before collecting the data. The researcher also ensured that the data collected was only applied for the purpose of the objective stated in this study only. The personal information collected from the respondents was held confidentially and never shared with any other person. All the information collected from the participants was maintained with complete privacy to ensure their dignity and confidentiality.

3.9 Conclusions

This chapter has described the methodology that was applied in carrying out the research of the study. The study adopted a mixed methodology. For quantitative research, the study used primary data collected using a questionnaire from the representative sample. The primary data was then analyzed using statistical techniques such as SEM, and correlation analysis. The qualitative research was based on previous literature, which is related to the topic of studies, such as relevant books, articles from refereed journals,

academic publications, and presentations. The data was then be analyzed using descriptive statistics.



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CHAPTER 4

ANALYSIS AND FINDINGS

4.1 Introduction

This chapter will contribute towards the objectives of this study by presenting the analysis and findings of the Integration of Perceived Autonomy and Absorptive Capacity to UTAUT Model in an Empirical Investigation of Students' Intention to Use MOOC in Thailand and Pakistan. The chapter is organized into several sections. The first section is a descriptive statistic of the demographic variables used in the data. The second section sections are the descriptive statistics of the opinions of the respondents regarding the study variables, including the performance expectancy, effort expectancy, social influence, facilitating conditions, perceived autonomy, absorptive capacity, culture, and behavioral intention to use. The third section presents the evaluation of the research models, including correlation analysis and model fitness. The fourth section is a presentation of the findings of the Structural Equation Modelling (SEM), and the last section is a summary of the chapter.

This study was carried out in two countries, Thailand and Pakistan. The target of the sample size was 400 respondents from each country. However, since the data was collected online, the study collected a total of 513 from Pakistan and 490 from Thailand. The study of the two countries was done separately, and then the last analysis of Multi-group analysis was conducted.

This section presents the analysis in several sections. Thailand and Pakistan results have been presented separated as illustrated below:

1. The first section presents the analysis of demographic statistics based on each country – Thailand and Pakistan.
2. The second section discusses the descriptive analysis results of the respondents' views on each study constructs.

3. The third section presents the results of the Test for Normality and Correlation Analysis.
4. The fourth section presents the results for the measurement model, including CFA analysis.
5. The fifth section is the validity and reliability analysis results.
6. The sixth chapter presents the SEM analysis results. For the above section, Thailand and Pakistan results have been presented separately.
7. The last section is the multi-group analysis results.

4.2 Thailand Analysis & Findings

4.2.1 Thailand Descriptive Statistics

The demographics statistics are presented in Table 4.1 below. From the statistics collected, males in Thailand were 41.0%, and women were 59.0%. Considering the age variable, the highest age category was 21 – 30 years for Thailand, being 71.8%. The second biggest age category was the 18 – 20 years represented by 20.8%. However, it does not have a respondent who was Older than 60 Years.

Table 4.1. Descriptive Statistics

		Thailand	
		n	%
Gender	Male	201	41.0
	Female	289	59.0
Age	18 – 20 Years	102	20.8
	21 - 30 Years	352	71.8
	31 - 40 Years	26	5.3
	41 - 50 Years	9	1.8
	51 - 60 Years	1	0.2
	Older than 60 Years	0	0
Education Level	High School / Diploma	9	1.7
	Bachelor's Degree	428	79
	Post-Graduate or Higher	51	9.4

	Thailand	
	n	%
Occupation		
Student	392	80
Company Employee	52	10.6
Government Officer	20	4.1
Self-Employed	21	4.3
Unemployed	5	1
Thailand Universities		
Chiang Mai University	46	9.4
Mae Fah Luang University	46	9.4
Khon Kaen University	46	9.4
Chulalongkorn University	50	10.2
Thammasat University	50	10.2
Mahidol University	50	10.2
KMITL	51	10.4
KMUTT	51	10.4
Burapaha University	50	10.2
Prince of Songkhla University	50	10.2
Monthly Income		
Less than or Equal to 10,000 Baht	278	56.7
More than 10,000 Baht - 20,000 Baht	122	24.9
More than 20,000 Baht - 30,000 Baht	50	10.2
More than 30,000 Baht - 40,000 Baht	8	1.6
More than 40,000 Baht	32	6.5
Computer Knowledge		
Very Poor	37	7.6
Poor	115	23.5
Moderate	284	58.0
Good	47	9.6
Very Good	7	1.4
Internet Knowledge		
Very Poor	80	16.3
Poor	180	36.7
Moderate	216	44.1
Good	14	2.9
Very Good	0	0
Internet Consumer		
Don't Use	0	0
1 - 5 Years	26	5.3
6 - 10 Years	197	40.2
More than 10 Years	267	54.5
		Thailand

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	n	%
Internet Usage		
Less than 1 Hour	0	0
1 - 2 Hours	10	2.0
2 - 3 Hours	49	10.0
More than 3 Hours	431	88.0

For the purpose of data collection, different universities were selected in Thailand. An almost similar number of respondents were selected from each university, as the study adopted a stratified sampling technique. The monthly income variable assessed the income of the respondents. According to the statistics, most of the respondents earned Less than or Equal to 10,000 Baht, represented by 56.7% for Thailand. The second-largest category was those who earned More than 10,000 Baht - 20,000 Baht, represented by 24.9%. The computer knowledge variable was grouped into five categories, from very poor to very good. Most of the respondents in Thailand respondents (58.0%) indicated to have moderate computer knowledge. Another variable investigated was the internet knowledge of the respondents, where most of the respondents in Thailand (44.1%) indicated to have moderate internet knowledge. The study also investigated the internet consumption of the respondents. The majority of the respondents in Thailand (54.5%) indicated to have used the internet for more than 10 years. The last demographic variable was internet usage per day, where 88.0% in Thailand indicated that they use the internet for more than 3 hours per day.

4.2.2 Respondents Opinions in Thailand

This section analyzes the feedback of the respondents regarding the various latent variables, and their observant variables. There were 8 latent variables used in this study, which include the performance expectancy, effort expectancy, social influence, facilitating condition, absorptive capacity, behavioral intention to use MOOCs, and perceived autonomy.

Performance Expectancy

In the respondents' reviews, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.2. Performance Expectancy Respondents Opinion in Thailand

Performance Expectancy	Opinion Level					Mean	Std. Dev.	Level	
	1	2	3	4	5				
Perceived Usefulness						3.89	0.8	Agree	
Using MOOCs enables me to accomplish my learning activities more quickly	n	1	12	135	221	121	3.91	0.79	Agree
	%	0.2	2.4	27.6	45.1	24.7			
Using MOOCs improves my learning performance (i.e., Develop New Skills, Techniques and Gain Experience)	n	1	10	122	243	114	3.93	0.76	Agree
	%	0.2	2	24.9	49.6	23.3			
Using MOOCs increases productivity in my learning activities	n	1	16	130	224	119	3.9	0.8	Agree
	%	0.2	3.3	26.5	45.7	24.3			
Using MOOCs enhances my understanding of complex subjects	n	2	16	134	235	103	3.85	0.79	Agree
	%	0.4	3.3	27.3	48	21			
Using MOOCs would make makes it easier to complete my courses and modules faster	n	3	15	161	191	120	3.83	0.85	Agree
	%	0.6	3.1	32.9	39	24.5			
I find MOOCs useful in my learning activities	n	1	11	140	192	146	3.96	0.83	Agree
	%	0.2	2.2	28.6	39.2	29.8			
Relative Advantage						3.76	0.86	Agree	
Using MOOCs enables me to learn more quickly as compared to traditional classroom	n	1	27	153	199	110	3.79	0.85	Agree
	%	0.2	5.5	31.2	40.6	22.4			
Using MOOCs improves the quality of my learning activities	n	2	27	170	184	107	3.74	0.87	Agree
	%	0.4	5.5	34.7	37.6	21.8			
Outcome Expectations						3.78	0.84	Agree	
If I use MOOCs, I will increase the chances of getting higher marks on tests and exams for the same amount of effort	n	2	17	159	201	111	3.82	0.83	Agree
	%	0.4	3.5	32.4	41	22.7			
If I use MOOCs, my classmates will perceive me as competent	n	3	33	157	193	104	3.73	0.88	Agree
	%	0.6	6.7	32	39.4	21.2			
If I use MOOCs, I will increase my chances of advancing to the next level	n	2	14	179	183	112	3.79	0.83	Agree
	%	0.4	2.9	36.5	37.3	22.9			
Overall						3.72	0.84	Agree	

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Performance expectancy was evaluated using three observant variables, perceived usefulness, relative advantage, and outcome expectations. Considering the perceived usefulness, the highest-ranked perceived usefulness was “I find MOOCs useful in my learning activities” (mean of 3.96) followed by “Using MOOCs improves my learning performance (i.e., Develop New Skills, Techniques and Gain Experience)” (mean of 3.93). The overall response mean was 3.89 and a standard deviation of 0.80. Considering the relative advantage, the highest-rated relative advantage was “Using MOOCs enables me to learn more quickly as compared to the traditional classroom” (mean of 3.79), while the overall mean was 3.76. The highest respondents’ views of outcome expectancy was “If I use MOOCs, I will increase the chances of getting higher marks on tests and exams for the same amount of effort” (mean of 3.82). The overall outcome expectancy mean was 3.78.

Effort Expectancy

In the respondents’ reviews, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.3. Effort Expectancy Respondents Opinion in Thailand

Effort Expectancy	Opinion Level					Mean	Std. Dev	Level	
	1	2	3	4	5				
Frequency (n) & Percentages (%)									
Perceived Ease of Use						3.85	0.83	Agree	
Learning to operate MOOCs is easy for me	n	22	132	208	128	3.9	0.83	Agree	
	%	4.5	26.9	42.4	26.1				
I expect I can work well with MOOCs	n	1	16	147	209	117	3.86	0.81	Agree
	%	0.2	3.3	30	42.7	23.9			
I find MOOCs to be flexible to interact with	n	1	20	151	194	124	3.85	0.85	Agree
	%	0.2	4.1	30.8	39.6	25.3			
It is easy for me to become skillful at using MOOCs	n		23	159	201	107	3.8	0.83	Agree
	%		4.7	32.4	41	21.8			
Ease of Use						3.86	0.84	Agree	
I believe I require little effort to understand how MOOCs works	n	3	21	154	198	114	3.81	0.86	Agree
	%	0.6	4.3	31.4	40.4	23.3			
Overall, I believe that MOOCs are easy to use	n		17	143	198	132	3.9	0.83	Agree
	%		3.5	29.2	40.4	26.9			
Overall						3.84	0.85	Agree	

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Effort expectancy was evaluated using two observant variables, perceived ease of use and ease of use. The highest-rated ease of use response was that “Learning to operate MOOCS is easy for me” (mean of 3.90), followed by “I expect I can work well with MOOCs” with a mean of 3.86. The overall mean for perceived ease of use was 3.85. For the ease of use, the highest response was “Overall, I believe that MOOCs are easy to use” (mean of 3.90), and the overall mean 3.86.

Perceived Autonomy

In the respondents’ reviews for the perceived autonomy, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.4. Perceived Autonomy Respondents Opinion in Thailand

Perceived Autonomy	Opinion Level					Mean	Std. Dev.	Level	
	1	2	3	4	5				
	Frequency (n) & Percentages (%)								
Sense of Responsibility						3.76	0.85	Agree	
I have good study habits and time management using MOOCs	n	5	27	160	199	99	3.73	0.87	Agree
	%	1	5.5	32.7	40.6	20.2			
I am independent to adopt various learning forms using MOOCs	n	1	24	159	199	107	3.78	0.84	Agree
	%	0.2	4.9	32.4	40.6	21.8			
I have a great sense of personal responsibility using MOOCs	n	1	26	160	205	98	3.76	0.83	Agree
	%	0.2	5.3	32.7	41.8	20			
Self Confidence						3.75	0.84	Agree	
I feel confident in my ability to learn using MOOCs	n	5	21	159	207	98	3.75	0.85	Agree
	%	1	4.3	32.4	42.2	20			
I show initiative and judgment in carrying out my learning activities when using MOOCs	n	3	22	162	213	90	3.74	0.82	Agree
	%	0.6	4.5	33.1	43.5	18.4			
Freedom						3.80	0.84	Agree	
Using MOOCs gives me learning freedom	n		13	158	199	120	3.86	0.81	Agree
	%		2.7	32.2	40.6	24.5			
I usually feel free to make my own decision using MOOCs	n	3	26	148	207	106	3.78	0.86	Agree
	%	0.6	5.3	30.2	42.2	21.6			
Using MOOCs, I can decide which activities I want to learn at a time that is appropriate for me	n	2	22	165	199	102	3.76	0.84	Agree
	%	0.4	4.5	33.7	40.6	20.8			
Overall						3.72	0.84	Agree	

Perceived autonomy was evaluated using three observant variables, the sense of responsibility, self-confidence, and freedom. The highest-rated sense of responsibility was that “I am independent to adopt various learning forms using MOOCs” with a mean of 3.78 followed by “I have a great sense of personal responsibility using MOOCs” with a mean of 3.76. The overall mean for the sense of responsibility was 3.76. Considering the self-confidence, the highest rated was “I show initiative and judgment in carrying out my learning activities when using MOOCs” with a mean of 3.74 and an overall mean of 3.75. The freedom response was that “Using MOOCs gives me learning freedom,” with a mean of 3.86 and an overall mean of 3.80.

Social Influence

In the respondents’ reviews for social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.5. Social Influence Respondents Opinion in Thailand

Social Influence	Opinion Level					Mean	Std. Dev.	Level
	1	2	3	4	5			
	Frequency (n) & Percentages (%)							
General Social Influence						3.71	0.86	Agree
People who influence my behavior think that I should use MOOCs	n 11	38	162	206	73	3.5959	0.91118	Agree
	% 2.2	7.8	33.1	42	14.9			
People who are important to me think I should use MOOCs	n 1	28	161	208	92	3.7388	0.83453	Agree
	% 0.2	5.7	32.9	42.4	18.8			
My learning institution supports the use of MOOCs	n 4	16	164	204	102	3.7837	0.8376	Agree
Learners who use MOOCs enjoy more prestige than those who do not	% 0.8	3.3	33.5	41.6	20.8			
Peer Social Influence						3.49	1.01	
Learners who use MOOCs enjoy more prestige than those who do not	n 36	51	163	168	72	3.3857	1.08729	Agree
	% 7.3	10.4	33.3	34.3	14.7			
Learners who use MOOCs have a high profile	n 22	42	173	175	78	3.5	1.00561	Agree
	% 4.5	8.6	35.3	35.7	15.9			
My peers think that I should use MOOCs	n 13	32	183	180	82	3.5837	0.93234	Agree
	% 2.7	6.5	37.3	36.7	16.7			
Overall						3.6712	0.9177	Agree

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The social influence latent variable was evaluated using two observant variables, the general social influence and peer social influence. With regard to Pakistan, the highest-rated general social influence was “People who are important to me think I should use MOOCs” with a mean of 3.60, and an overall mean of 3.55. For the peer social influence, the highest response was “Learners who use MOOCs enjoy more prestige than those who do not” (mean of 3.59). For the case of Thailand, the highest-rated general social influence was “My learning institution supports the use of MOOCs” with a mean of 3.78, followed by “People who are important to me think I should use MOOCs”, and an overall mean of 3.71. For the peer social influence, the highest response was “My peers think that I should use MOOCs” (mean of 3.58), and an overall mean of 3.49.

Facilitating Conditions

In the respondents’ reviews for the social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.6. Facilitating Condition Respondents Opinion in Thailand

Facilitating Conditions	Opinion Level					Mean	Std. Dev.	Level
	1	2	3	4	5			
	Frequency (n) & Percentages (%)							
Perceived Behavioral Control						3.89	0.83	
I have the necessary resources to use MOOCs	n 2	15	132	198	143	3.94	0.84	Agree
	% 0.4	3.1	26.9	40.4	29.2			
I have the necessary knowledge to use MOOCs	n 2	14	157	208	109	3.83	0.81	Agree
	% 0.4	2.9	32	42.4	22.2			
Facilitating Conditions						3.75	0.89	
Guidance is available to me in the selection of MOOCs	n 6	19	159	206	100	3.76	0.86	Agree
	% 1.2	3.9	32.4	42	20.4			
Specialized instructions concerning MOOCs is available to me	n 6	15	149	194	126	3.85	0.88	Agree
	% 1.2	3.1	30.4	39.6	39.6			
I get support from a specific person/group when I face difficulties with MOOCs	n 9	32	165	177	107	3.69	0.94	Agree
	% 1.8	6.5	33.7	36.1	21.8			
Using MOOCs fits my learning style	n 7	24	174	188	97	3.7	0.88	Agree
	% 1.4	4.9	35.5	38.4	19.8			
Overall						3.79	0.89	Agree

The facilitating condition latent variable was evaluated using perceived behavioral control and facilitating condition observant variables. Considering the case of Thailand, the highest perceived behavioral control variable was “I have the necessary resources to use MOOCs” (mean of 3.94), followed by “I have the necessary knowledge to use MOOCs” (mean of 3.83). Considering the facilitating conditions, the highest response was “Specialized instructions concerning MOOCs is available to me” (mean of 3.85), followed by “Guidance is available to me in the selection of MOOCs” (mean of 3.76). The overall mean for perceived behavioral control was 3.89, while that of facilitating conditions was 3.75.

Absorptive Capacity

In the respondents’ reviews for social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.7. Absorptive Capacity Respondents Opinion in Thailand

Absorptive Capacity	Opinion Level						Mean	Std. Dev.	Level
	1	2	3	4	5				
	Frequency (n) & Percentages (%)								
Knowledge Acquisition							3.75	0.84	Agree
I am able to generate an environment of trust using MOOCs.	n	3	18	178	192	99	3.74	0.83	Agree
	%	0.6	3.7	36.3	39.2	20.2			
I am able to acquire information using MOOCs for my learning activities.	n	2	21	160	204	103	3.78	0.83	Agree
	%	0.4	4.3	32.7	41.6	21			
I am able to obtain latest knowledge in education-related issues using MOOCs	n	5	24	164	196	101	3.74	0.87	Agree
	%	1	4.9	33.5	40	20.6			
Knowledge Assimilation							3.73	0.84	Agree
I am able to learn through interactive discussions forum using MOOCs	n	3	24	175	192	96	3.72	0.85	Agree
	%	0.6	4.9	35.7	39.2	19.6			
I am able to communicate my ideas regularly using MOOCs	n	3	21	174	201	91	3.72	0.83	Agree
	%	0.6	4.3	35.5	41	18.6			

		Opinion Level					Mean	Std. Dev.	Level	
		1	2	3	4	5				
Absorptive Capacity										
		Frequency (n) & Percentages (%)								
I am able to assimilate research and education-related issues using MOOCs	n	6	19	165	206	94	3.74	0.85	Agree	
	%	1.2	3.9	33.7	42	19.2				
Knowledge Transformation							3.77	0.83	Agree	
I am able to share important knowledge using MOOCs	n	2	24	164	207	93	3.74	0.83	Agree	
	%	0.4	4.9	33.5	42.2	19				
MOOCs make it easier to share knowledge	n		22	157	206	105	3.8	0.82	Agree	
	%		4.5	32	42	21.4				
Overall							3.75	0.83	Agree	

The absorptive capacity was evaluated using three observant variables, knowledge acquisition, knowledge assimilation, and knowledge transformation. The response with the highest knowledge acquisition was “I am able to acquire information using MOOCs for my learning activities” with a mean of 3.78, followed by “I am able to generate an environment of trust using MOOCs” (mean of 3.74). The overall mean for knowledge acquisition was 3.75. The highest knowledge assimilation was response was “I am able to assimilate research and education-related issues using MOOCs” (mean of 3.74) with an overall average of 3.73. Considering the knowledge transformation, the highest response was that “MOOCs make it easier to share knowledge” with a mean of 3.80, followed by “I am able to share important knowledge using MOOCs” (mean of 3.74). The overall mean response was 3.77.

Behavioral Intention to Use

In the respondents’ reviews for social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.8. Behavioral Intention Respondents Opinion in Thailand

Behavioral Intention	Opinions Level					mean	std. dev	Level	
	1	2	3	4	5				
Intention						3.76	0.84	Agree	
I intend to use MOOCs immediately	n	5	33	196	173	83	3.6	0.88	Agree
	%	1	6.7	40	35.3	16.9			
I intend to use MOOCs in future learning sessions	n	1	16	170	186	117	3.82	0.83	Agree
	%	0.2	3.3	34.7	38	23.9			
I intend to utilize MOOCs for various purposes such as self-development as well as earning credit hours	n	1	20	157	199	113	3.82	0.83	Agree
	%	0.2	4.1	32	40.6	23.1			
If MOOCs become more diverse in the future, I intend to use them frequently after graduation	n	2	17	163	199	109	3.8	0.83	Agree
	%	0.4	3.5	33.3	40.6	22.2			
Prediction							3.81	0.84	Agree
I predict I will use MOOCs in future learning sessions	n	1	15	149	195	130	3.89	0.83	Agree
	%	0.2	3.1	30.4	39.8	26.5			
I predict I will use MOOCs immediately	n	5	30	178	183	94	3.67	0.88	Agree
	%	1	6.1	36.3	37.3	19.2			
I predict I will utilize MOOCs for various purposes such as self-development as well as earning credit hours	n	1	16	160	200	113	3.83	0.82	Agree
	%	0.2	3.3	32.7	40.8	23.1			
If MOOCs become more diverse in the future, I predict I will use them frequently after graduation	n	0	23	147	198	122	3.85	0.84	Agree
	%	0	4.7	30	40.4	24.9			
Planning							3.74	0.86	Agree
I plan to use MOOCs in future learning sessions	n	1	16	176	190	107	3.78	0.82	Agree
	%	0.2	3.3	35.9	38.8	21.8			
I plan to use MOOCs immediately	n	11	24	178	176	101	3.67	0.93	Agree
	%	2.2	4.9	36.3	35.9	20.6			
I plan to utilize MOOCs for various purposes such as self-development as well as earning credit hours	n	3	18	173	197	99	3.75	0.82	Agree
	%	0.6	3.7	35.3	40.2	20.2			
If MOOCs become more diverse in the future, I plan to use them frequently after graduation	n	2	23	168	191	106	3.76	0.85	Agree
	%	0.4	4.7	34.3	39	21.6			

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Considering the intention observant variable, the highest intention response was “I intend to utilize MOOCs for various purposes such as self-development as well as earning credit hours” and “I intend to use MOOCs in future learning sessions” both, which had a mean of 3.82, followed by “If MOOCs become more diverse in the future, I intend to use them frequently after graduation” which had a mean of 3.80. The overall mean for the intention was 3.76. Considering the prediction observant variable, the highest response was “I predict I will use MOOCs in future learning sessions” (mean of 3.89), followed by “If MOOCs become more diverse in the future, I predict I will use them frequently after graduation” (mean of 3.85). The overall mean for prediction was 3.81. Lastly, the highest planning response was “I plan to use MOOCs in future learning sessions” with a mean of 3.78) followed by “If MOOCs become more diverse in the future, I plan to use them frequently after graduation” (mean of 3.76). The overall planning mean was 3.74.

Culture

In the respondents’ reviews for social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.9. Culture Respondents Opinion in Thailand

	Opinion Levels					mean	Std. Dev	Level	
	1	2	3	4	5				
Individualism/Collectivism	Frequency (n) & Percent (%)					3.74	0.85	Agree	
I get better learning results when I study as a MOOC group member than when I study independently on my own	n	5	28	157	201	99	3.74	0.88	Agree
	%	1	5.7	32	41	20.2			
Group success is more important than individual success while studying MOOCs	n	6	17	161	212	94	3.76	0.84	Agree
	%	1.2	3.5	32.9	43.3	19.2			
Group loyalty should be encouraged even if individual goals suffer while studying MOOCs	n	2	23	167	207	91	3.74	0.83	Agree
	%	0.4	4.7	34.1	42.2	18.6			
Uncertainty Avoidance							3.80	0.83	Agree
Studying MOOCs, rules and regulations are important because they inform me what is expected of me	n	3	21	162	213	91	3.75	0.83	Agree
	%	0.6	4.3	33.1	43.5	18.6			

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Studying the order and structure of MOOCs learning modules is important	n	1	18	161	207	103	3.80	0.82	Agree
	%	0.2	3.7	32.9	42.2	21			
It is important to have detailed learning outcomes in details so that I always know what I'm expected to study	n		23	150	192	125	3.86	0.85	Agree
	%		4.7	30.6	39.2	25.5			
It is important to follow MOOCs instructions and procedures closely	n	1	15	172	190	112	3.81	0.83	Agree
	%	0.2	3.1	35.1	38.8	22.9			
Standardized work procedures are helpful when studying with MOOCs	n	1	23	155	199	112	3.81	0.85	Agree
	%	0.2	4.7	31.6	40.6	22.9			
Learners should avoid shift to using MOOCs because it is a better learning tool	n								
	n	2	19	150	225	94	3.80	0.81	Agree
	%	0.4	3.9	30.6	45.9	19.2			

The culture variable was evaluated using two observant variables – individualism/collectivism and uncertainty avoidance. For the individualism/collectivism, the response with the highest score was “Group success is more important than individual success while studying MOOCs” with a mean of 3.76, while the last ones were “I get better learning results when I study as a MOOC group member than when I study independently on my own” and “Group loyalty should be encouraged even if individual goals suffer while studying MOOCs” both with a mean of 3.74. The overall score for individualism/collectivism was 3.74, with a standard deviation of 0.85. For the uncertainty avoidance, the highest response was “It is important to have detailed learning outcomes in details so that I always know what I'm expected to study” with a mean of 3.86 and the one with the least response was “Studying MOOCs, rules, and regulations are important because they inform me what is expected of me” with a mean of 3.75. The overall uncertainty avoidance mean was 3.80.

4.2.3 Test for Normality and Correlation Analysis for Thailand

This section presents the results of the normality tests, evaluated using the skewness and kurtosis criteria, and the correlation analysis of the variables.

Test for Normality

This section evaluated whether the latent variables were normally distributed. There were eight latent variables measured by different observant variables. The variables were: performance expectance measured by three variables (perceived usefulness, relative advantage, and outcome expectancy); effort expectancy measured by two observed variables (perceived ease of use, Ease of use); Social influence measured by two variables (General social influence and Peer Social Influence); Facilitating Condition measured by two observed variables (Perceived behavioral control and Facilitating condition); Absorptive Capacity measured by two observed variables (Knowledge acquisition, Knowledge assimilation, and Knowledge transformation); Perceived autonomy measured by three observed variables (Sense of responsibility, Self-confidence, and Freedom); Behavioral Intention to use measured by three variables (Intention, Prediction, and Planning); and culture measured by two observed variables (Uncertainty avoidance and individualism/collectivism). The average of skewness and kurtosis for each observed variable in the latent variables are presented in Table 4.9 below, and the overall skewness and kurtosis in Appendix D.

Table 4.10. Test for Normality for Thailand

Variable	Skewness	Kurtosis	Normal Distribution
Performance Expectancy	-0.22309	-0.444	✓
Effort Expectancy	-0.20683	-0.62667	✓
Social Influence	-0.35433	-0.10217	✓
Facilitating Conditions	-0.32867	-0.1605	✓
Behavioral Intention to Use	-0.155	-0.498	✓
Absorptive Capacity	-0.18888	-0.31175	✓
Perceived Autonomy	-0.21375	-0.37938	✓
Culture	-0.20422	-0.36778	✓

For Thailand, the first latent variable was performance expectancy, which was measured by three variables (perceived usefulness, relative advantage, and outcome expectancy). Performance expectancy measured by two variables skewness ranged from -0.331 to -0.055, and kurtosis ranged from -0.729 to -0.056. Effort Expectancy measured

by two variables skewness ranged from -0.275 to -0.104 while kurtosis ranged from -0.819 to 0.0342. Social influence measured by two variables skewness ranged from -0.449 to -0.157, while kurtosis ranged from -0.484 to -0.005. Facilitating conditions measured by two variables skewness ranged from -0.418 to -0.18, while kurtosis ranged from -0.421 to -0.007. Behavioral intention to use was measured by three variables, and its skewness ranged from -0.358 to -0.069, and kurtosis ranged from -0.762 to -0.035. Absorptive capacity was evaluated using three variables, and its skewness ranged from -0.329 to -0.109, and kurtosis ranged from -0.70 to -0.105. Perceived autonomy was measured using three variables, and its skewness ranged from -0.324 to -0.057, while kurtosis ranged from -0.888 to -0.011. The culture was measured using two variables and ranged from -0.357 to -0.046, while kurtosis ranged from -0.599 to -0.143. The results above for skewness and kurtosis satisfy the normality assumption because all the variables skewness is not above 0.75, and kurtosis is not above 1.5 (Hooland, 1998). Since the data satisfied that normality test, it was considered suitable to be used in carrying out the Structural Equation Model Analysis (SEM).

Correlation Analysis in Thailand

The correlation analysis evaluates the relationship between variables. In this study, the observant variables for the 8 latent variables were evaluated differently for Pakistan and Thailand countries. The results of the two countries are presented differently as shown in the table below. Table 4.10 presents the correlation analysis of the observed variables of the latent variables in Thailand. The correlation coefficient of the performance expectancy ranged from 0.70 to 0.73; the correlation coefficient for the effort expectancy observed variables was 0.68; the correlation coefficient for social influence observed variables was 0.74; the correlation coefficient for facilitating conditions observed variables was 0.67; the correlation coefficient for absorptive capacity observed variables ranged between 0.77 to 0.80; the correlation coefficient for perceived autonomy observed variables ranged from 0.74 to 0.80; the correlation coefficient for behavioral intention to use observed variables ranged from 0.76 to 0.78; the correlation coefficient for culture observed variables was 0.76. From the statistics presented above, the correlation among these variables is satisfactory because the correlation coefficient is not below 0.3, indicating the suitability

of the variables to be used in SEM. Additionally, the correlation coefficient was not above the threshold of 0.8, which indicates the absence of multicollinearity.



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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Table 4.11. Thailand Correlation Analysis

	PU	RA	OE	PEO	EOU	GSI	PSI	PBC	PBC	IN	PR	PL	Kac	Kas	KTr	SR	SC	FRD	I/C	UA	
PU	1.00																				
RA	0.73	1.00																			
OE	0.70	0.72	1.00																		
PEO	0.68	0.60	0.67	1.00																	
EOU	0.57	0.46	0.57	0.68	1.00																
GSI	0.66	0.57	0.66	0.66	0.63	1.00															
PSI	0.59	0.57	0.67	0.57	0.55	0.74	1.00														
PBC	0.51	0.42	0.49	0.59	0.55	0.56	0.56	1.00													
FC	0.63	0.60	0.62	0.61	0.55	0.72	0.67	0.67	1.00												
IN	0.65	0.53	0.60	0.67	0.60	0.67	0.66	0.65	0.66	1.00											
PR	0.63	0.48	0.59	0.63	0.59	0.62	0.66	0.61	0.62	0.79	1.00										
PL	0.60	0.48	0.59	0.60	0.55	0.60	0.63	0.58	0.58	0.76	0.80	1.00									
Kac	0.64	0.52	0.58	0.61	0.58	0.61	0.63	0.64	0.66	0.71	0.74	0.76	1.00								
Kas	0.61	0.51	0.57	0.63	0.54	0.62	0.63	0.56	0.65	0.67	0.72	0.71	0.78	1.00							
KTr	0.61	0.48	0.59	0.65	0.58	0.63	0.59	0.55	0.59	0.69	0.73	0.69	0.72	0.77	1.00						
SR	0.58	0.50	0.58	0.60	0.56	0.59	0.58	0.58	0.65	0.64	0.68	0.67	0.69	0.72	0.71	1.00					
SC	0.59	0.50	0.55	0.59	0.58	0.58	0.57	0.57	0.58	0.67	0.72	0.69	0.71	0.68	0.74	0.78	1.00				
FRD	0.56	0.46	0.56	0.59	0.57	0.57	0.56	0.55	0.54	0.66	0.68	0.68	0.68	0.66	0.73	0.74	0.78	1.00			
I/C	0.56	0.47	0.58	0.58	0.59	0.60	0.62	0.55	0.60	0.64	0.65	0.65	0.65	0.68	0.66	0.65	0.66	0.69	1.00		
UA	0.59	0.50	0.55	0.61	0.56	0.59	0.60	0.59	0.60	0.69	0.69	0.66	0.66	0.67	0.69	0.69	0.70	0.73	0.76	1.00	

4.2.4 Measurement of the Model for Thailand

The measurement of the model was implemented using the Confirmatory factor analysis and the validity and reliability analysis.

First Model CFA Analysis

CFA Analysis – Performance Expectancy Variable

The first CFA model evaluated the validity of the performance expectancy three observed variables; Perceived Usefulness (PU), Relative Advantage (RA) and Outcome Expectation (OE). As presented in figure 4.1 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, PU had the highest factor weight of 0.86 while RA and OE had equal factor weights of 0.84 each. The factor weights were statistically significant at 0.05 level of significance.

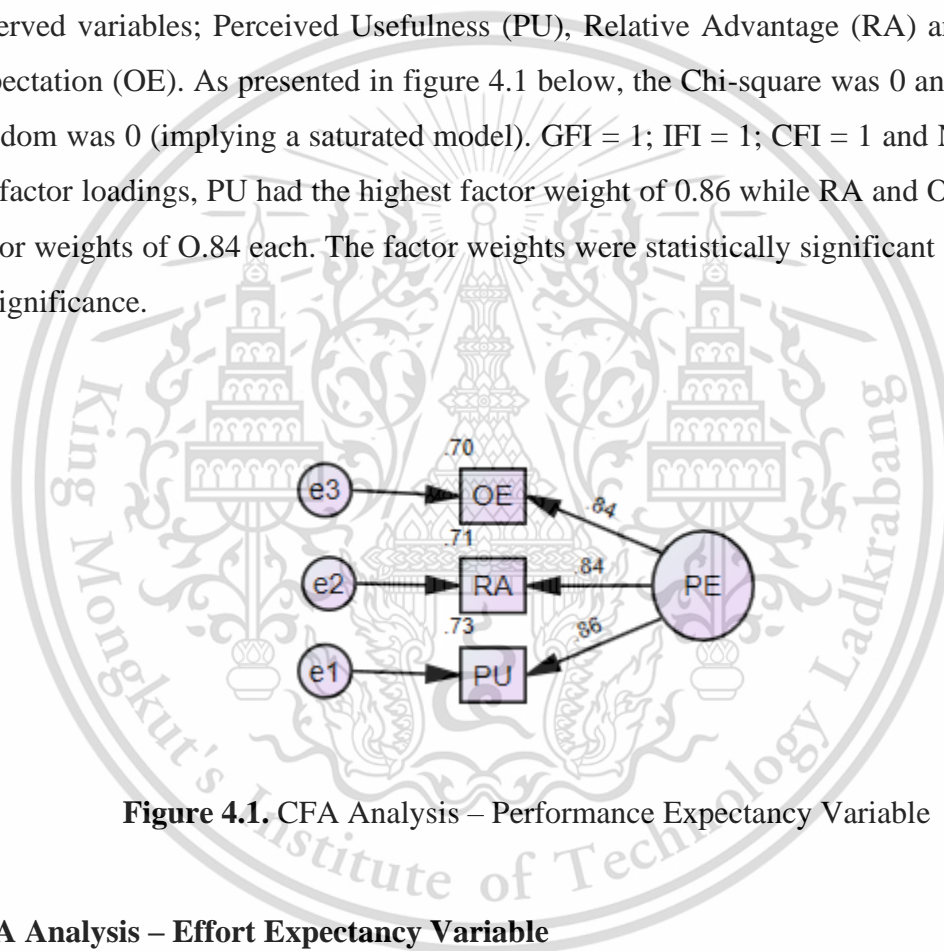


Figure 4.1. CFA Analysis – Performance Expectancy Variable

CFA Analysis – Effort Expectancy Variable

The second CFA model evaluated the validity of the effort expectancy two observed variables; Ease of Use (EU) and Perceived Ease of Use (PEU). As presented in figure 4.2 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, perceived ease of use (PEU) had the highest factor weight of 0.92 ease of use (EU) factor weight was of 0.86 each. The factor weights were statistically significant at 0.05 level of significance.

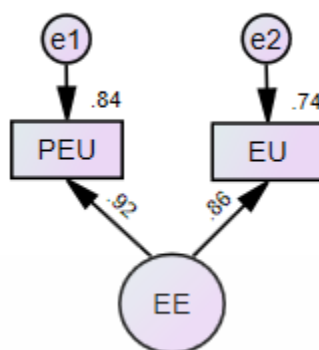


Figure 4.2: CFA Analysis – Effort Expectancy Variable

CFA Analysis – Perceived Autonomy Variable

The third CFA model evaluated the validity of the perceived autonomy variable with three observed variables namely freedom, self-confidence (SC) and sense of responsibility (SR). As presented in figure 4.3 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, freedom had the highest factor weight of 0.89 followed by sense of responsibility (SR) with a factor weight of 0.88 and the last one was self-confidence (SC) with a factor weight of 0.87. The factor weights were statistically significant at 0.05 level of significance.

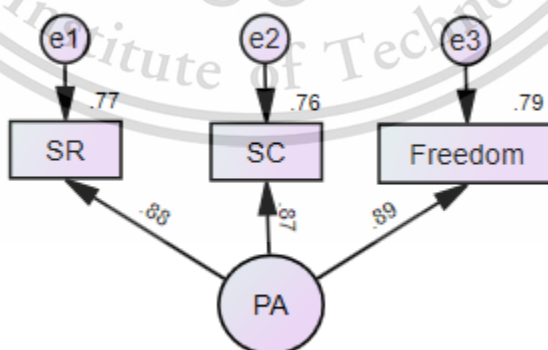


Figure 4.3. CFA Analysis – Perceived Autonomy Variable

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

CFA Analysis – Social Influence Variable

The fourth CFA model evaluated the validity of the social influence variable with two observed variables namely Perceived Social Influence (PSI) and General Social Influence (GSI). As presented in figure 4.4 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, general social influence (GSI) had the highest factor weight of 0.82 followed by perceived social influence (PSI) with a factor loading of 0.68. The factor weights were statistically significant at 0.05 level of significance.

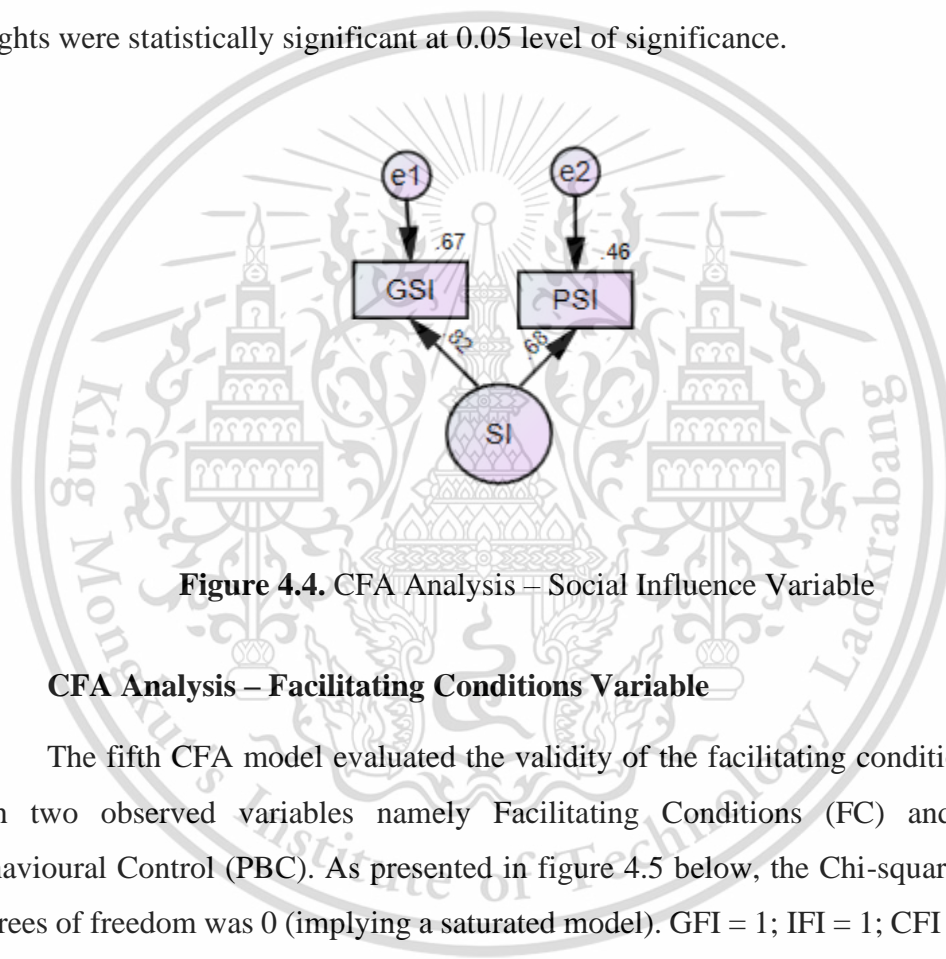


Figure 4.4. CFA Analysis – Social Influence Variable

CFA Analysis – Facilitating Conditions Variable

The fifth CFA model evaluated the validity of the facilitating conditions variable with two observed variables namely Facilitating Conditions (FC) and Perceived Behavioural Control (PBC). As presented in figure 4.5 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, perceived behavioral control (PBC) had the highest factor weight of 0.96 followed by facilitating conditions (FC) with a factor loading of 0.63. The factor weights were statistically significant at 0.05 level of significance.

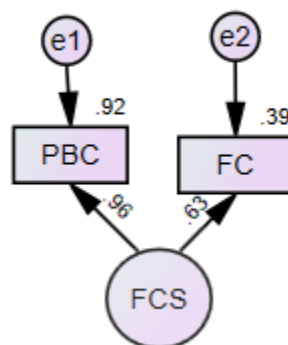


Figure 4.5. CFA Analysis – Facilitating Conditions Variable

CFA Analysis – Absorbed Capacity Variable

The sixth CFA model evaluated the validity of the absorbed capacity variable with three observed variables namely Knowledge Transformation, Knowledge Assimilation, Knowledge Acquisition. As presented in figure 4.6 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, knowledge assimilation (KAss) had the highest factor weight of 0.90 followed by knowledge acquisition (KAaq) with a factor weight of 0.89 and the last one was knowledge transformation (KTrans) with a factor weight of 0.83. The factor weights were statistically significant at 0.05 level of significance.

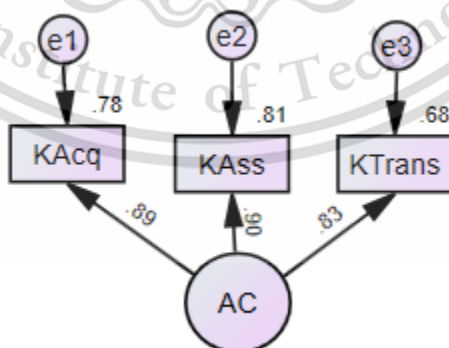


Figure 4.6. CFA Analysis – Absorbed Capacity Variable

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

CFA Analysis – Behavioral Intention to use

The seventh CFA model evaluated the validity of the absorbed capacity variable with three observed variables namely Intention to use, Prediction to use, Planning to use. As presented in figure 4.7 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, prediction to use had the highest factor weight of 0.95 followed by intention to use with a factor weight of 0.89 and the last one was planning to use with a factor weight of 0.87 respectively. The factor weights were statistically significant at 0.05 level of significance

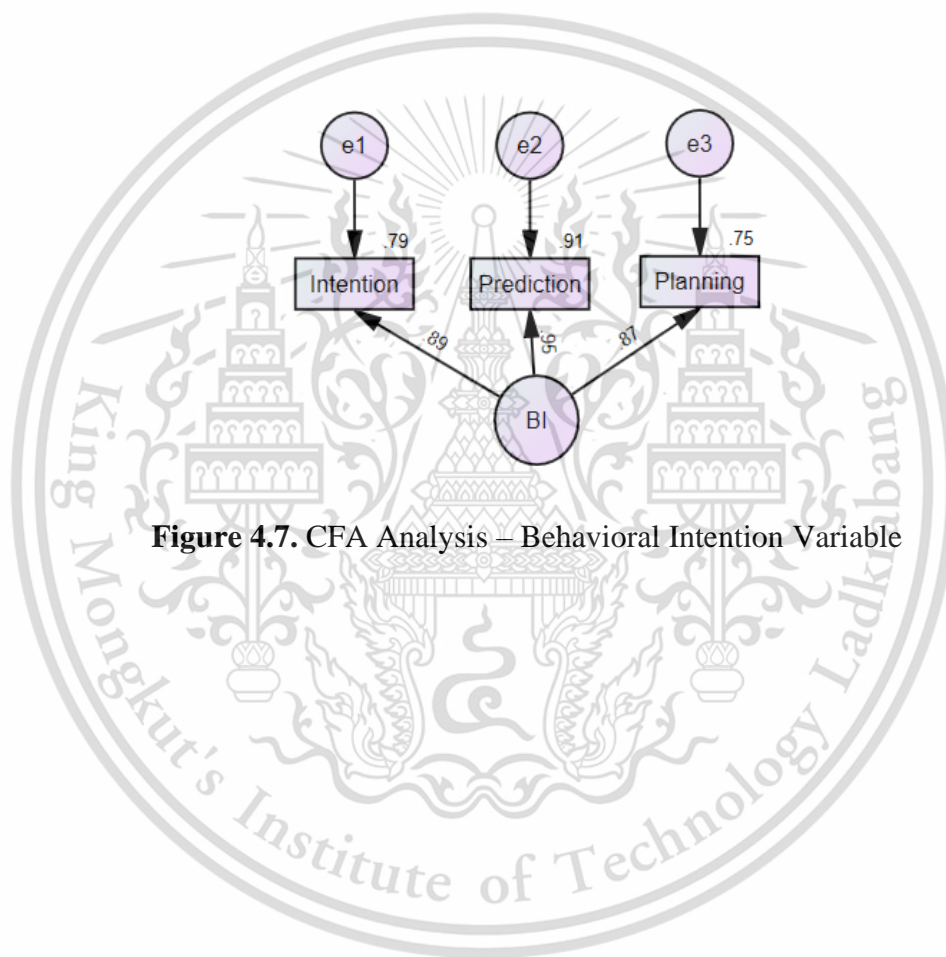


Figure 4.7. CFA Analysis – Behavioral Intention Variable

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Second Model CFA Analysis

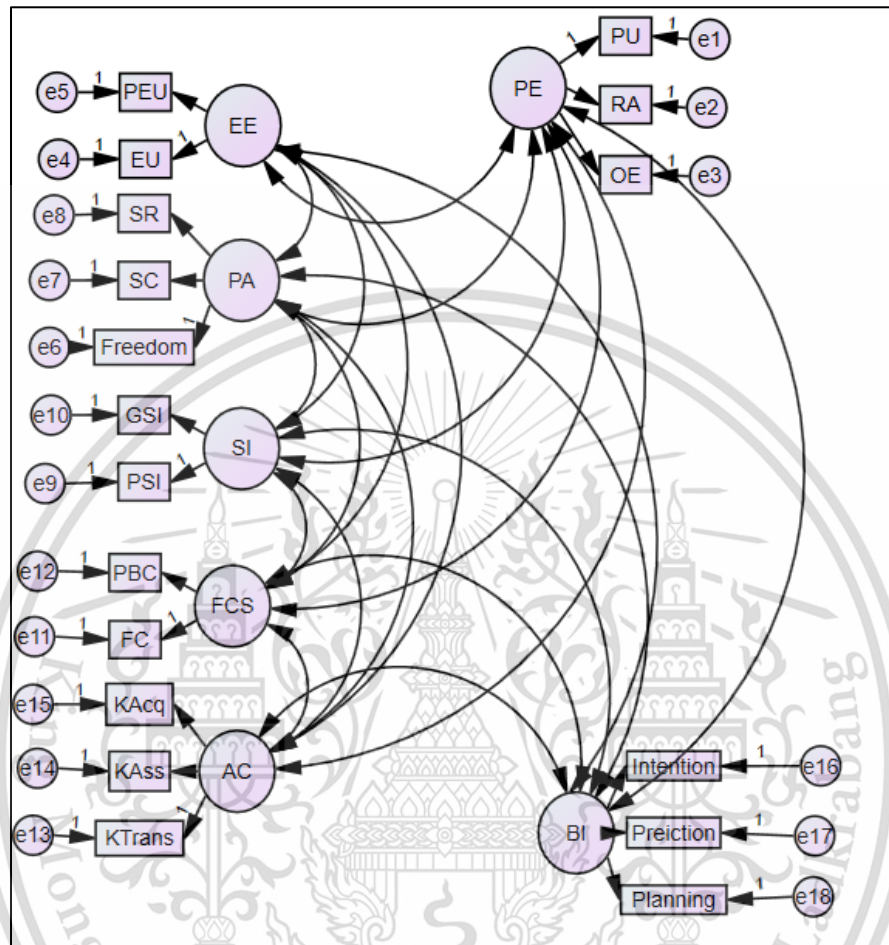


Figure 4.8. CFA Measurement Model for Thailand

For the case of Thailand, the figure 4.2 below shows the standardized estimates of the loadings and the r-squared values of the indicator variables. The CFA model fitness criteria indicate that the initial model fits well with the data.

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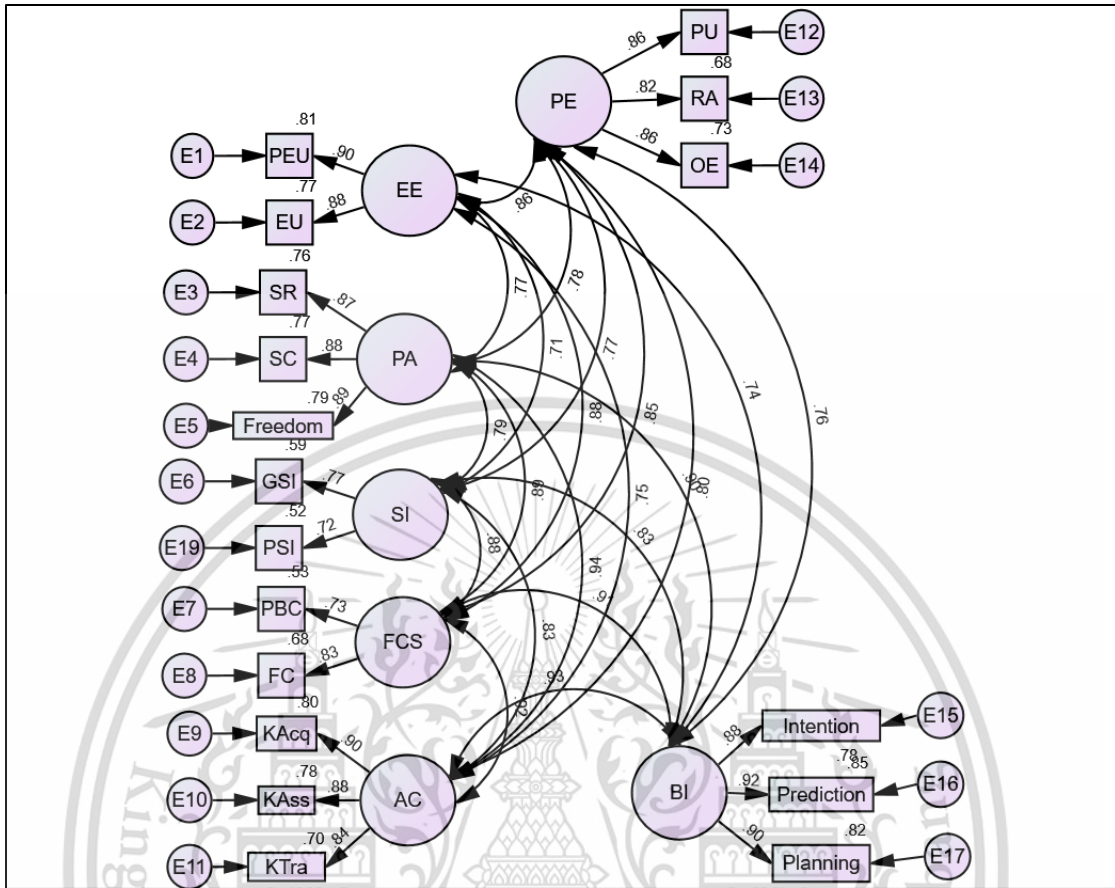


Figure 4.9. CFA for Thailand

For the case of Thailand, the base model proved to have a fit to the data. The chi-square statistic for the model was significant ($\chi^2 [114] = 354.916, p < 0.01$), while the more practical alternative, the χ^2/df ratio = 3.113 (considered acceptable since it was below 5 and was being influenced by sample size) (Schumacker & Lomax, 2004; Hu & Bentler, 1999;). The CFI is 0.971; TLI is 0.956; NFI is 0.957; which provided an excellent fit, since the values were greater than 0.9 or close to 1.0. Additionally, the RMSEA is 0.063 (below the threshold of 0.80) (Browne & Cudeck, 1993; Schumacker & Lomax, 2010). The results of the CFA for Thailand data indicated that it was feasible to move on and conduct the multi-group Structural Equation Modeling (SEM). These results are summarized in the table below.

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Table 4.12. Measurement Model Fit Indices

Indices	Criteria	Statistics Value
CMIN/DF	<5	3.113
GFI	≥ 0.90	0.923
NFI	≥ 0.90	0.957
IFI	≥ 0.90	0.971
CFI	≥ 0.90	0.971
RMR	<0.08	0.013
RMSEA	<0.08	0.063
Conclusion		Model Fit

In addition to the evaluation of the model fitness, the factor loadings of the CFA were also evaluated to determine how the observed variables contributed to the effect of the latent variables. The table below presents the factor loadings of the observed variables, their t-values, whether significant or not, as well as squared multiple correlation values. The results are discussed in this section.

Considering the Performance expectancy (PE) latent variable, Perceived usefulness (PU) was found to have the highest factor loading score of 0.857 and a square multiple correlation of 0.735, which explained approximately 74% of Performance expectancy variation. It was followed by Outcome Expectation (OE), having a factor loading score of 0.856 and a square multiple correlation of 0.733, which explained approximately 73% of Performance expectancy variation. The last one was Relative Advantage (RA) which had a factor loading score of 0.823 with a squared multiple correlations of 0.677, accounting for 68% variation in PE.

Considering the Effort expectancy (EE) latent variable, Perceived Ease of Use (PEU) was found to have the highest factor loading score of 0.897 and a square multiple correlation of 0.803, which explained approximately 80% of effort expectancy variation. It was followed by Ease of Use (EU), having a factor loading score of 0.879 and a square multiple correlation of 0.773, which explained approximately 77% variation.

For the Perceived Autonomy (PA), freedom was found to have the highest factor loading score of 0.889 and a square multiple correlation of 0.79, which explained approximately 79% of perceived autonomy variation. It was followed by self-confidence having a factor loading score of 0.877 and a square multiple correlation of 0.77 which explained approximately 77% variation. The last one was social responsibility (SR), having a factor loading score of 0.873 and a square multiple correlation of 0.762, which explained approximately 76% variation.

Considering Social Influence (SI) latent variable, General Social Influence (GSI) was found to have the highest factor loading score of 0.769 and a square multiple correlation of 0.591, which explained approximately 59% of effort expectancy variation. It was followed by Peer Social Influence (PSI) having a factor loading score of 0.721 and a square multiple correlation of 0.52, which explained approximately 52% variation.

For the Facilitating Conditions (FCS) latent variable, facilitating condition (FC) was found to have the highest factor loading score of 0.826 and a square multiple correlation of 0.682, which explained approximately 68% of effort expectancy variation. It was followed by perceived behavioural control (PBC) having a factor loading score of 0.726 and a square multiple correlation of 0.528, which explained approximately 53% variation.

For the Absorptive capacity (AC) variable, knowledge acquisition (KA_{acq}) was found to have the highest factor loading score of 0.896 and a square multiple correlation of 0.803, which explained approximately 80% of variation. It was followed by knowledge assimilation (KA_{ass}), having a factor loading score of 0.884 and a square multiple correlation of 0.781, which explained approximately 78% variation. The last one was knowledge transformation (K_{trans}), having a factor loading score of 0.836 and a square multiple correlation of 0.699, which explained approximately 70% variation.

Considering the behavioral intention (BI) latent variable, the prediction was found to have the highest factor loading score of 0.924 and a square multiple correlation of 0.803, which explained approximately 80% of variation. It was followed by planning having a factor loading score of 0.904 and a square multiple correlation of 0.817, which explained approximately 82% variation. The last one was intention having a factor loading score of

0.882 and a square multiple correlation of 0.854, which explained approximately 85% variation.

Table 4.13. CFA Factor Loadings

Variables Latent Variable	Observed Variable	Factor Loading			t	Squared- R
		Estimate	S.E.	Beta		
PE	PU	1.000		0.857		0.735
	RA	1.171	0.052	0.823	22.328**	0.677
	OE	1.131	0.048	0.856	23.779**	0.733
						CR = 0.883; AVE= 0.715
EE	EU	1.000		0.879		0.773
	PEU	0.937	0.036	0.897	26.134**	0.805
						CR = 0.882; AVE = 0.789
PA	Freedom	1.000		0.889		0.79
	SC	1.042	0.037	0.877	27.932**	0.77
	SR	0.996	0.036	0.873	27.611**	0.762
						CR = 0.911; AVE = 0.774
SI	PSI	1.000		0.721		0.52
	GSI	0.840	0.056	0.769	14.925**	0.591
						CR = 0.714; AVE = 0.556
FCS	FC	1.000		0.826		0.682
	PBC	0.859	0.047	0.726	18.135**	0.528
						CR = 0.753 AVE = 0.605
AC	KTrans	1.000		0.836		0.699
	KAss	1.055	0.042	0.884	25.346**	0.781
	KAcq	1.079	0.042	0.896	25.96**	0.803
						CR = 0.905; AVE = 0.761
BI	Intention	1.000		0.882		0.777
	Prediction	1.061	0.034	0.924	31.215**	0.854
	Planning	1.063	0.036	0.904	29.69**	0.817
						CR = 0.93; AVE = 0.816

4.2.5 Validity and Reliability Analysis for Thailand

The reliability and validity of the model constructs were evaluated in this section. The reliability was evaluated using Fornell and Larcker (1981) criteria that the convergent reliability (CR) of every construct should be equal to or higher than 0.70, (which satisfies the act that all the items were able to accurately measure the factors (Nunnally

& Bernstein, 1994), and the average variance extracted (AVE) should be equal to or higher than 0.50 (Segars, A. H. (1997). The CR and AVE for Thailand data are presented in the table below.

Table 4.14. Validity and Reliability Analysis

Variables	Thailand	
	CR	AVE
BI	0.930	0.816
EE	0.882	0.789
PA	0.911	0.774
SI	0.714	0.556
FCS	0.753	0.605
AC	0.905	0.761
PE	0.883	0.715

From the table above, the Convergent Reliability (CR) ranged between 0.753 – 0.930, while the AVE for Pakistan and Thailand ranged between 0.605 and 0.816, respectively. From the results, all factor loading, CR Alpha, and AVE values meet the recommended norms and standards, meaning that the proposed construct convergence validity of the measurement model.

4.2.6 Research result of empirically determining the effects of behavioral intention to use MOOCs in Thailand

Structural Equation Modelling (SEM) for Thailand

This section was carried out to address the first objective of the study “To empirically determine the effects of behavioral intention to use MOOCs in Thailand” which was addressed by conducting SEM analysis.

Initial Models

After establishing the fitness of the model, the structural equation model was developed, for Thailand. These initial models served as the subsequent models for testing moderating effects. In this research, there were two types of moderation effects that were performed:

a) The moderation effects of culture variable on the relationship between the independent variables and the dependent variable.

b) The multi-group SEM analysis, where the country (Thailand and Pakistan) were used as the two groups to compare the relationship between the variables.

Prior to conducting the multi-group analysis with the categorical variable of the country (Thailand and Pakistan) and the moderation effect of the culture variable, the SEM model for each country was conducted, and the path analysis is presented in the following section

Initial SEM Analysis for Thailand

Overview of Terms

The Structural Equation Modelling (SEM) was applied to evaluate the effects of various variables on the Behavioral intention to use MOOCs in Thailand. The variables applied were both latent variables and observed variables. The table below shows the symbols used to represent the variables and their relationship.

Table 4.15. Symbols used in SEM





Symbol	Meaning
	Latent Variable
	Observed Variable
	Causal Relationship
	Non-causal relationship

Table 4.16. Abbreviation of the Variables used for SEM

Variable's symbol		Variable Names
Latent Variable	Observed Variable	
PE	PU	Perceived Usefulness
	RA	Relative Advantage
	OE	Outcome Expectation
EE	EU	Ease of Use
	PEU	Perceived Ease of Use
PA	Freedom	Freedom
	SC	Self Confidence
	SR	Sense of Responsibility
SI	PSI	Perceived Social Influence
	GSI	General Social Influence
FCS	FC	Facilitating Conditions
	PBC	Perceived Behavioural Control
AC	KTrans	Knowledge Transformation
	KAss	Knowledge Assimilation
	KAcq	Knowledge Acquisition
BI	Intention	Intention to use
	Prediction	Prediction to use
	Planning	Planning to use

Based on the review of the literature and with reference to the developed hypothesis of the study, the following model frame for SEM was developed.

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ตัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

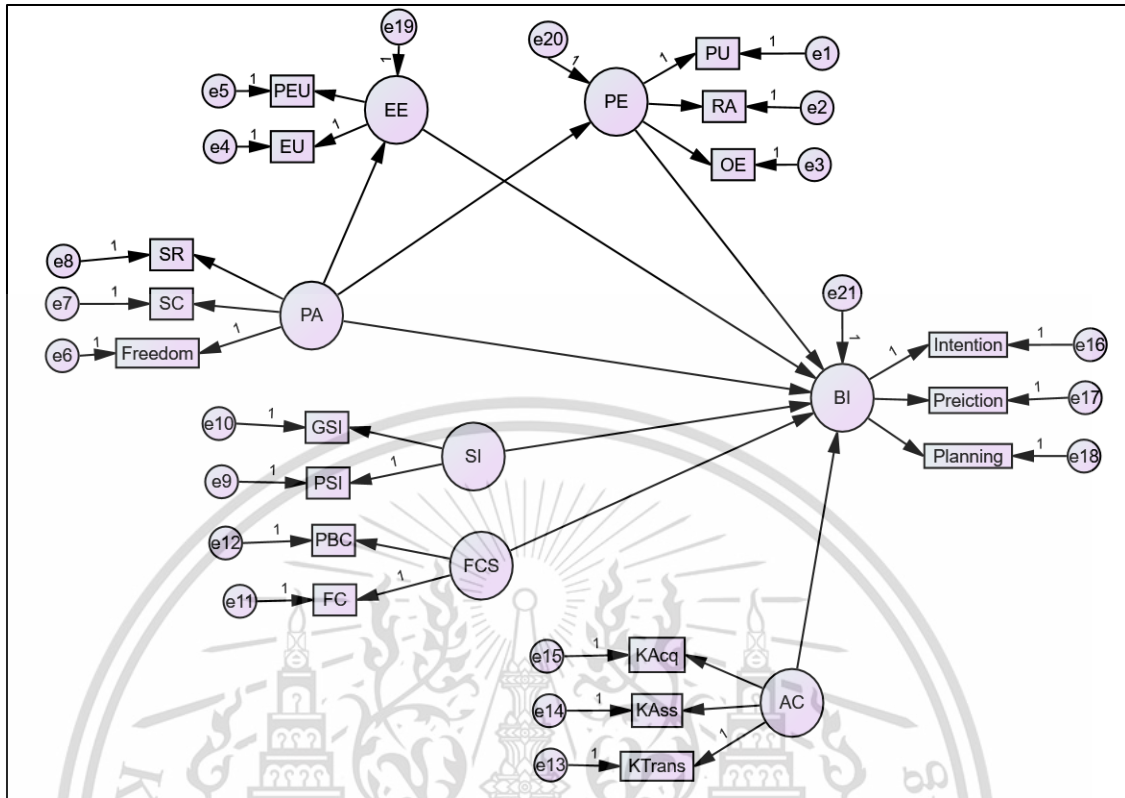


Figure 4.10. Model framework developed for SEM

After the analysis of the SEM model for Thailand, the following SEM model output was obtained.

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

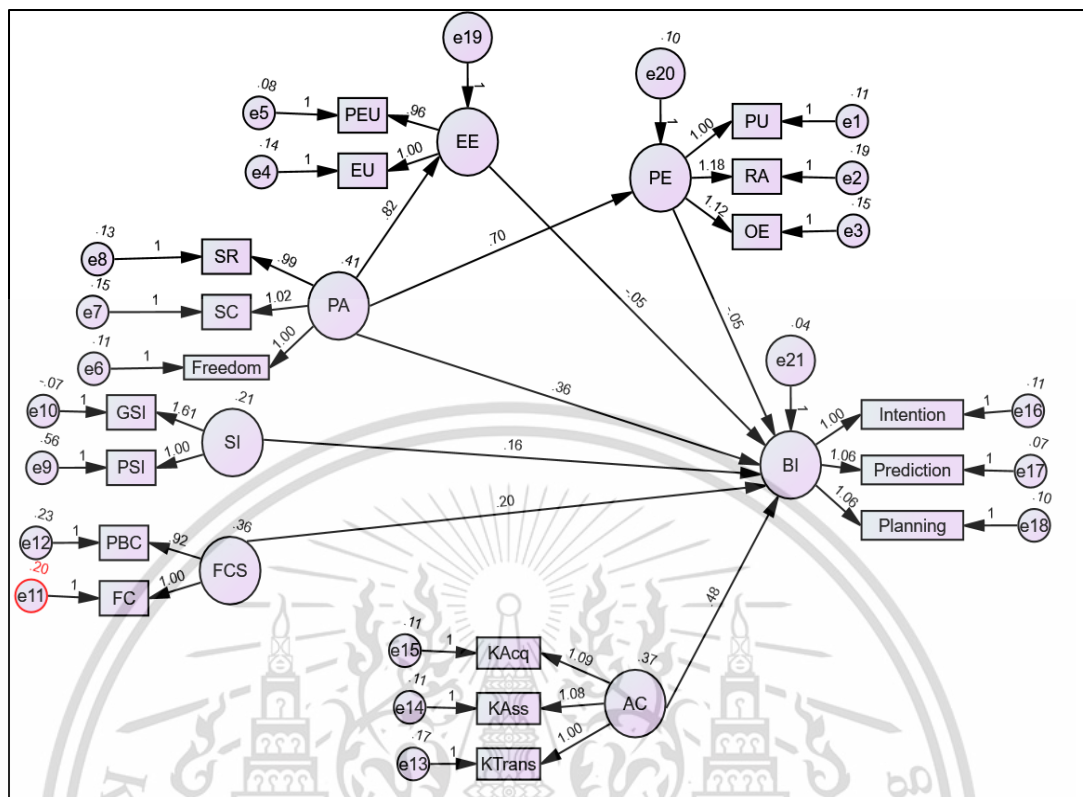


Figure 4.11. Initial SEM Analysis for Thailand

The figure above shows the path analysis results with the standardized estimates of the loadings and the r-squared values of the indicator variables. The model fitness of the SEM was evaluated for the seven latent variables used in the study. For the case of Thailand, the base model proved to have a fit for the data. The chi-square statistic for the model was significant ($\chi^2 [121] = 525.820, p < 0.01$), while the more practical alternative, the χ^2/df ratio = 4.219 was below five and was influenced by the sample size (Schumacker, Lomax & Schumacker, 2015; Hu & Bentler, 1999). The CFI was 0.951; TLI was 0.938; NFI was 0.937, which provided an excellent fit since the values were greater than 0.9 or close to 1.0. Considering that all the other thresholds were above 0.9 and GFI would round off to 0.9, the model was considered satisfactory. Additionally, the RMSEA was 0.063 (below the threshold of 0.80) (Browne & Cudeck, 1992; Schumacker, Lomax, & Schumacker, 2015). These results are summarised in the table below.

Indices	Criteria	Statistics Value
CMIN/DF	<5	4.219
GFI	≥0.90	0.886
NFI	≥0.90	0.937
IFI	≥0.90	0.951
CFI	≥0.90	0.951
RMR	<0.08	0.021
RMSEA	<0.08	0.063
Conclusion		Model Fit

The path relationship between the endogenous and exogenous variables is shown in the table below.

Regression Weights

Table 4.17. Path Analysis Regression Weights for Thailand

Paths	Estimate	S.E.	C.R.	p-value	Significance
Direct Effects					
PE <--- PA	.705	.037	19.022	***	
EE <--- PA	.821	.045	18.396	***	
BI <--- PA	.359	.064	5.589	***	
BI <--- FCS	.196	.030	6.448	***	
BI <--- EE	-.051	.043	-1.178	0.239	
BI <--- PE	-.048	.054	-.896	0.370	
BI <--- AC	.478	.031	15.365	***	
BI <--- SI	.155	.029	5.277	***	
Indirect Effects					
BI <---EE <---PA	-0.042	-0.133	0.042	0.405	
BI <---PE <---PA	-0.034	-0.131	0.055	0.511	

Note: *** significant at 0.01; ** significant at 0.05; BI = Behavioral intention to use; PE = Performance Expectancy; EE = Effort expectancy; PA = Perceived Autonomy; SI = Social Influence; FCS = Facilitating Conditions; AC = Absorptive Capacity

From the table above, four variables have a significant and positive effect on behavioral intention to use (BI). PA was found to have a positive and significant effect on BI ($\beta = 0.359$, $p < 0.01$), FCS has a positive and significant effect on BI ($\beta = 0.196$, $p < 0.01$), AC has a positive and significant effect on BI ($\beta = 0.478$, $p < 0.01$), SI has a positive and significant effect on BI ($\beta = 0.155$, $p < 0.01$). However, the results indicated that PE

and EE have a non-significant effect on BI. Additionally, PA have a positive and significant effect on PE ($\beta = 0.705$, $p < 0.01$), and EE ($\beta = 0.821$, $p < 0.01$).

4.2.7 Direct, Indirect and Total Effects

The results of the direct, indirect and total effects of the various variables on behavioral intention to use are shown in the sections below

Direct effects

The direct effects considered in the analysis were from the effect of PA, FSC, EE, PE, AC and SI on BI which has the following coefficients as 0.359, 0.196, -0.051, -0.048, 0.478, 0.155 respectively.

Indirect Effects

The indirect effects considered in the analysis was from the PA to BI whose value as shown in the table below was 0.757

Total Effects

The total effects were found for all the variables PA, FSC, EE, PE, AC and SI on their effect on BI whose coefficients as presented in the figure below include 0.196, -0.051, -0.048, 0.478, 0.155 and 0.283 respectively.

Table 4.18. Direct, Indirect and Total Effects

			Direct Effects	Indirect Effects	Total Effects
BI	<---	PA	0.359	-0.07571 (0.821*-0.051)+(0.705*-0.048)	0.28329 (-0.07571+0.359)
BI	<---	FCS	0.196	-	0.196
BI	<---	EE	-0.051	-	-0.051
BI	<---	PE	-0.048	-	-0.048
BI	<---	AC	0.478	-	0.478
BI	<---	SI	0.155	-	0.155

4.2.8 Research result of empirically determining the moderation effects of behavioral intention to use MOOCs in Thailand

Moderation effects of culture variable for Thailand

This section was carried out to address the second objective of the study “To empirically determine the moderation effect of culture on behavioral intention to use MOOCs in Thailand” which was addressed by conducting SEM moderating analysis with culture as the variable.

In this analysis, there were eight variables, the independent variables (performance expectancy, effort expectancy, social influence, facilitating conditions, absorptive capacity, and perceived autonomy), the dependent variable (behavioral intention to use MOOC), and moderating variable (culture). The interaction between the independent variables ((performance expectancy, effort expectancy, social influence, facilitating conditions, absorptive capacity, and perceived autonomy) with the moderator variables (culture) was calculated using the variables standardized values. The model and results are presented in the figure below.

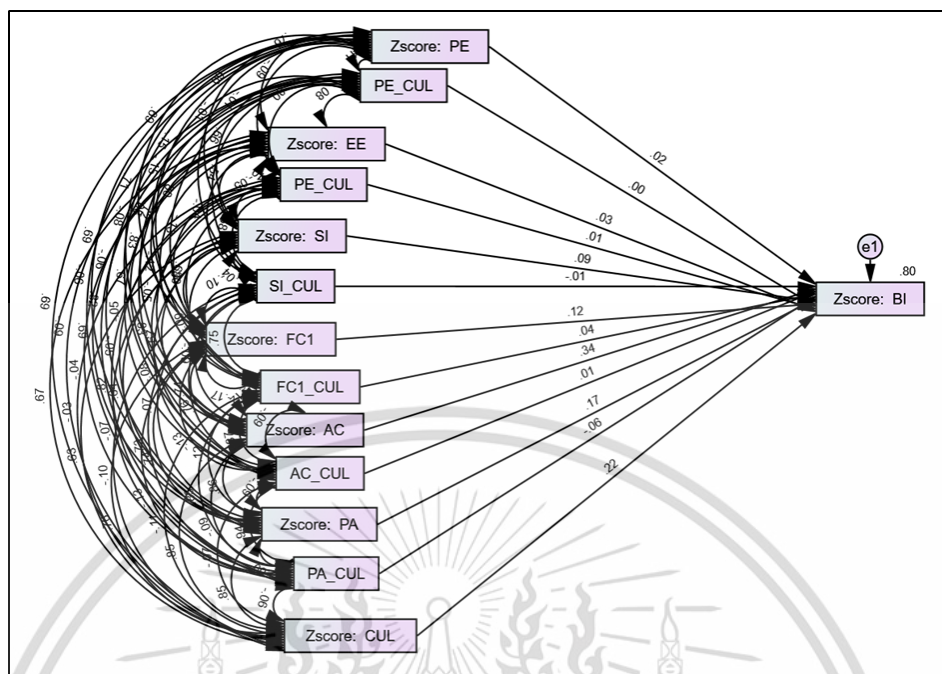


Figure 4.12. Thailand Moderation Analysis

Table 4.19. Thailand Moderation Analysis

	Estimate	S.E.	C.R.	P
Direct Effects				
ZBI <--- ZSI	.093	.030	3.094	**
ZBI <--- ZFC1	.122	.037	3.288	**
ZBI <--- ZAC	.336	.047	7.162	***
ZBI <--- ZPA	.168	.046	3.649	***
ZBI <--- ZCUL	.223	.045	4.930	***
ZBI <--- ZEE	.033	.035	.942	.346
ZBI <--- ZPE	.016	.036	.440	.660
Interaction Effects				
ZBI <--- PE_CUL	.000	.031	-.005	.996
ZBI <--- EE_CUL	.006	.034	.182	.856
ZBI <--- SI_CUL	-.005	.028	-.184	.854
ZBI <--- AC_CUL	.008	.052	.144	.885
ZBI <--- PA_CUL	-.046	.048	-.953	.341
ZBI <--- FC1_CUL	.029	.035	.850	.395

Note: *** = significance at 99% CL; ** significant at 95% CL; ZBI = Standardized Behavioral intention to use; ZPE = Standardized Performance Expectancy; ZEE = Standardized Effort expectancy; ZPA = Standardized Perceived Autonomy; ZSI = Standardized Social Influence; ZFC1 = Standardized Facilitating Conditions; ZAC = Standardized Absorptive Capacity

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The results above indicate that Culture (ZCUL), Perceived autonomy (ZPA), and Absorptive Capacity (ZAC) have a significant effect on Behavioral intention at 99% confidence levels, since their $\beta = 0.223; 0.168; 0.336, p < 0.01$, respectively. Additionally, Facilitating Condition (ZFC1) and Social Influence (ZSI) has a significant effect on behavioral intention (ZBI) at 95% CL since their $\beta = 0.122; 0.093; p < 0.05$ respectively. However, Performance Expectancy (ZPE) and Effort Expectancy (ZEE) has an insignificant effect on behavioral intention (ZBI). Considering the mediation effects of culture on the relationship between independent variables and dependent variable (ZBI), the results indicate that all the interaction between culture and independent variables has an insignificant effect on the dependent variables at all levels, both at 95% and 99% confidence levels. This indicates that culture does not moderate any relationship between the independent variables and the dependent variables.

4.3 Pakistan Analysis

4.3.1 Descriptive Statistics

The demographics statistics are presented in Table 4.15 below. From the statistics collected, male in Pakistan was 71.5% while women for Pakistan were 28.5%. Considering the age variable, highest age category was 21 – 30 years for Pakistan being 67.6%. As well, for both countries, second biggest age category was the 18 – 20 years represented by 18.9% in Pakistan.

Table 4.20. Descriptive Statistics for Pakistan

		Pakistan	
		n	%
Gender	Male	367	71.5
	Female	146	28.5
Age	18 – 20 Years	97	18.9
	21 - 30 Years	347	67.6
	31 - 40 Years	52	10.1
	41 - 50 Years	10	1.9
	51 - 60 Years	4	0.8

Older than 60 Years	3	0.6
Education Level		
High School / Diploma	11	2.1
Bachelor's Degree	305	59.5
Post-Graduate or Higher	195	38
Occupation		
Student	409	79.7
Company Employee	40	7.8
Government Officer	32	6.2
Self-Employed	18	3.5
Unemployed	14	2.7
Pakistan Universities		
Ghulam Ishaq Institute	50	9.7
Lahore University of Management Science	52	10.1
COMSATS University	50	9.7
Bahria University	50	9.7
Institute of Business Administration	50	9.7
Greenwich University	51	9.9
		Pakistan
		n
		%
Iqra University	52	10.1
SZABIST	52	10.1
Virtual University	53	10.3
University of Balochistan	53	10.3
Monthly Income		
Less than or Equal to 10,000 Baht	341	66.5
More than 10,000 Baht - 20,000 Baht	89	17.3
More than 20,000 Baht - 30,000 Baht	39	7.6
More than 30,000 Baht - 40,000 Baht	16	3.1
More than 40,000 Baht	28	5.5
Computer Knowledge		
Very Poor	9	1.8
Poor	34	6.6
Moderate	183	35.7
Good	208	40.5
Very Good	79	15.4
Internet Knowledge		
Very Poor	6	1.2
Poor	24	4.7
Moderate	138	26.9
Good	240	46.8
Very Good	105	20.5
Internet Consumer		

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Don't Use	4	0.8
1 - 5 Years	161	31.4
6 - 10 Years	177	34.5
More than 10 Years	171	33.3
Internet Usage		
Less than 1 Hour	17	3.3
1 - 2 Hours	74	14.4
2 - 3 Hours	109	21.2
More than 3 Hours	313	61.0

Considering the university variable, different universities were selected. An almost similar number of respondents were selected from each university, as the study adopted a stratified sampling technique. The monthly income variable assessed the income of the respondents. According to the statistics, most of the respondents for both countries earned Less than or Equal to 10,000 Baht, represented by 66.5% for Pakistan. The second-largest category was those who earned More than 10,000 Baht - 20,000 Baht, represented by 17.3%. The computer knowledge variable was grouped into five categories from very poor to very good. Most of the respondents in Pakistan were those with Good computer Knowledge (40.5%). Another variable investigated was the internet knowledge of the respondents, where most of the respondents (46.8%) indicated to have Good internet knowledge. The study also investigated the internet consumption of the respondents, where the majority of the respondents (34.5%) indicated to have consumed the internet for 6 – 10 years. The last demographic variable was the internet usage per day, where the majority (61.0%) indicated that they use the internet for more than 3 hours per day.

4.3.2 Respondents Opinions for Pakistan

This section analyzes the feedback of the respondents regarding the various latent variables, and their observant variables. There were 8 latent variables used in this study, which include the performance expectancy, effort expectancy, social influence, facilitating condition, absorptive capacity, behavioral intention to use MOOCs, and perceived autonomy.

Performance Expectancy

In the respondents' reviews, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

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Table 4.21. Performance Expectancy Respondents Opinion for Pakistan

Performance Expectancy	Opinion Levels					Mean	Std. Dev.	Level	
	1	2	3	4	5				
	Frequency (n) & Percent (%)								
Perceived Usefulness						3.67	1.1	Agree	
Using MOOCs enables me to accomplish my learning activities more quickly	n	21	53	158	153	128	3.61	1.09	Agree
	%	4.1	10.3	30.8	29.8	25			
Using MOOCs improves my learning performance (i.e., Develop New Skills, Techniques, and Gain Experience)	n	21	41	128	166	157	3.77	1.09	Agree
	%	4.1	8	25	32.4	30.6			
Using MOOCs increases productivity in my learning activities	n	21	46	141	151	154	3.72	1.11	Agree
	%	4.1	9	27.5	29.4	30			
Using MOOCs enhances my understanding of complex subjects	n	25	55	159	131	143	3.61	1.14	Agree
	%	4.9	10.7	31	25.5	27.9			
Using MOOCs would make makes it easier to complete my courses and modules faster	n	20	48	142	162	141	3.69	1.09	Agree
	%	3.9	9.4	27.7	31.6	27.5			
I find MOOCs useful in my learning activities	n	25	41	146	168	133	3.67	1.09	Agree
	%	4.9	8	28.5	32.7	25.9			
Relative Advantage							3.45	1.17	Agree
Using MOOCs enables me to learn more quickly as compared to traditional classroom	n	54	71	161	109	118	3.32	1.26	Agree
	%	10.5	13.8	31.4	21.2	23			
Using MOOCs improves the quality of my learning activities	n	25	52	152	167	117	3.58	1.09	Agree
	%	4.9	10.1	29.6	32.6	22.8			
Outcome Expectations							3.61	1.11	Agree
If I use MOOCs, I will increase the chances of getting higher marks on tests and exams for the same amount of effort	n	28	50	153	149	133	3.6	1.13	Agree
	%	5.5	9.7	29.8	29	25.9			
If I use MOOCs, my classmates will perceive me as competent	n	23	55	180	130	125	3.54	1.11	Agree
	%	4.5	10.7	35.1	25.3	24.4			
If I use MOOCs, I will increase my chances of advancing to the next level	n	20	49	145	152	147	3.7	1.1	Agree
	%	3.9	9.6	28.3	29.6	28.7			
Overall							3.62	1.11	Agree

Performance expectancy was evaluated using three observant variables, perceived usefulness, relative advantage, and outcome expectations. Considering the perceived

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usefulness, the highest-ranked perceived usefulness was “Using MOOCs improves my learning performance (i.e., Develop New Skills, Techniques and Gain Experience)” (mean of 3.77) followed by “Using MOOCs increases productivity in my learning activities” (mean of 3.72). The overall response mean was 3.67 and a standard deviation of 1.10. Considering the relative advantage, the highest-rated relative advantage was “Using MOOCs improves the quality of my learning activities” (mean of 3.58), while the overall mean was 3.45. The highest respondents’ views of outcome expectancy were “If I use MOOCs, I will increase my chances of advancing to the next level” (mean of 3.7). The overall outcome expectancy mean was 3.61.

Effort Expectancy

In the respondents’ reviews, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.22. Effort Expectancy Respondents Opinion

Effort Expectancy		Opinions Level					Mean	Std. Dev	Level
		1	2	3	4	5			
		Frequency (n) & Percent (%)							
Perceived Ease of Use							3.7	1.04	Agree
Learning to operate MOOCs is easy for me	n	17	35	140	183	138	3.76	1.02	Agree
	%	3.3	6.8	27.3	35.7	26.9			
I expect I can work well with MOOCs	n	17	46	141	159	150	3.73	1.07	Agree
	%	3.3	9	27.5	31	29.2			
I find MOOCs to be flexible to interact with	n	10	61	145	172	125	3.66	1.03	Agree
	%	1.9	11.9	28.3	33.5	24.4			
It is easy for me to become skillful at using MOOCs	n	19	47	148	163	136	3.68	1.07	Agree
	%	3.7	9.2	28.8	31.8	26.5			
Ease of Use							3.75	1.03	Agree
I believe I require little effort to understand how MOOCs works	n	17	45	135	168	148	3.75	1.06	Agree
	%	3.3	8.8	26.3	32.7	28.8			
Overall, I believe that MOOCs are easy to use	n	12	39	149	170	143	3.76	1.01	Agree
	%	2.3	7.6	29	33.1	27.9			
Overall							3.72	1.04	Agree

Effort expectancy was evaluated using two observant variables, perceived ease of use and ease of use. The highest-rated ease of use response was that “Learning to operate MOOCS is easy for me” (mean of 3.76), followed by “I expect I can work well with MOOCs” with a mean of 3.73. The overall mean for perceived ease of use was 3.70. For the ease of use, the highest response was “Overall, I believe that MOOCs are easy to use” (mean of 3.76), and the overall mean was 3.75.

Perceived Autonomy

In the respondents’ reviews for the perceived autonomy, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.23. Perceived Autonomy Respondents Opinion

Perceived Autonomy	Opinion Levels					Mean	Std. Dev	Level	
	1	2	3	4	5				
	Frequency (n) & Percent (%)								
Sense of Responsibility						3.61	1.08	Agree	
I have good study habits and time management using MOOCs	n	28	51	160	161	113	3.55	1.1	Agree
	%	5.5	9.9	31.2	31.4	22			
I am independent to adopt various learning forms using MOOCs	n	22	47	153	170	121	3.63	1.07	Agree
	%	4.3	9.2	29.8	33.1	23.6			
I have a great sense of personal responsibility using MOOCs	n	19	49	151	163	131	3.66	1.07	Agree
	%	3.7	9.6	29.4	31.8	25.5			
Self Confidence						3.67	1.06	Agree	
I feel confident in my ability to learn using MOOCs	n	22	47	138	162	144	3.7	1.1	Agree
	%	4.3	9.2	26.9	31.6	28.1			
I show initiative and judgment in carrying out my learning activities when using MOOCs	n	16	47	158	182	110	3.63	1.02	Agree
	%	3.1	9.2	30.8	35.5	21.4			
Freedom						3.68	1.05	Agree	
Using MOOCs gives me learning freedom	n	16	47	137	176	137	3.72	1.05	Agree
	%	3.1	9.2	26.7	34.3	26.7			
I usually feel free to make my own decision using MOOCs	n	18	45	171	154	125	3.63	1.05	Agree
	%	3.5	8.8	33.3	30	24.4			
Using MOOCS, I can decide which activities I want to learn at a time that is appropriate for me	n	15	48	155	163	132	3.68	1.05	Agree
	%	2.9	9.4	30.2	31.8	25.7			
Overall						3.68	1.04	Agree	

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า ไม่ว่าจะกรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Perceived autonomy was evaluated using three observant variables, the sense of responsibility, self-confidence, and freedom. The highest-rated sense of responsibility was that “I have a great sense of personal responsibility using MOOCs” with a mean of 3.66 followed by “I am independent to adopt various learning forms using MOOCs” with a mean of 3.63. The overall mean for sense of responsibility was 3.61. Considering the self-confidence, the highest rated was “I feel confident in my ability to learn using MOOCs” with a mean of 3.70 and an overall mean of 3.67. The freedom response was that “Using MOOCs gives me learning freedom” with a mean of 3.72 and an overall mean of 3.68.

Social Influence

In the respondents’ reviews for social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.24. Social Influence Respondents Opinion

Social Influence		Opinion Levels					Mean	Std. Dev	Level
		1	2	3	4	5			
		Frequency (n), Percent (%)							
General Social Influence						3.55	1.08	Agree	
People who influence my behavior think that I should use MOOCs	n	21	62	171	148	111	3.51	1.08	Agree
	%	4.1	12.1	33.3	28.8	21.6			
People who are important to me think I should use MOOCs	n	19	47	180	141	126	3.6	1.06	Agree
	%	3.7	9.2	35.1	27.5	24.6			
My learning institution supports the use of MOOCs	n	27	54	155	162	115	3.55	1.1	Agree
Learners who use MOOCs enjoy more prestige than those who do not	%	5.3	10.5	30.2	31.6	22.4			
Peer Social Influence						3.52	1.10	Agree	
Learners who use MOOCs enjoy more prestige than those who do not	n	19	61	153	158	122	3.59	1.08	Agree
	%	3.7	11.9	29.8	30.8	23.8			
Learners who use MOOCs have a high profile	n	28	59	163	159	104	3.49	1.1	Agree
	%	5.5	11.5	31.8	31	20.3			
My peers think that I should use MOOCs	n	32	56	167	152	106	3.47	1.12	Agree
	%	6.2	10.9	32.6	29.6	20.7			
Overall						3.51	1.09	Agree	

The social influence latent variable was evaluated using two observant variables, the general social influence and peer social influence. With regard to Pakistan, the highest-rated general social influence was “People who are important to me think I should use MOOCs” with a mean of 3.60 and an overall mean of 3.55. For the peer social influence, the highest response was “Learners who use MOOCs enjoy more prestige than those who do not” (mean of 3.59). For the case of Thailand, the highest-rated general social influence was “My learning institution supports the use of MOOCs” with a mean of 3.78, followed by “People who are important to me think I should use MOOCs”, and an overall mean of 3.71. For the peer social influence, the highest response was “My peers think that I should use MOOCs” (mean of 3.58), and an overall mean of 3.49.

Facilitating Conditions

In the respondents’ reviews for the social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.25. Facilitating Condition Respondents Opinion

Facilitating Conditions	Opinion Levels					Mean	Std. Dev	Levels
	1	2	3	4	5			
	Frequency (n) percentage (%)							
Perceived Behavioral Control						3.67	1.10	Agree
I have the necessary resources to use MOOCs	n 21	58	138	164	132	3.63	1.1	Agree
	% 4.1	11.3	26.9	32	25.7			
I have the necessary knowledge to use MOOCs	n 24	44	137	164	144	3.7	1.1	Agree
	% 4.7	8.6	26.7	32	28.1			
Facilitating Conditions						3.47	1.14	Agree
Guidance is available to me in the selection of MOOCs	n 33	60	158	152	110	3.47	1.14	Agree
	% 6.4	11.7	30.8	29.6	21.4			
Specialized instructions concerning MOOCs is available to me	n 26	73	155	159	100	3.45	1.1	Agree
	% 5.1	14.2	30.2	31	19.5			
I get support from a specific person/group when I face difficulties with MOOCs	n 37	64	151	150	111	3.46	1.16	Agree
	% 7.2	12.5	29.4	29.2	21.6			
Using MOOCs fits my learning style	n 31	67	148	152	115	3.49	1.15	Agree
	% 6	13.1	28.8	29.6	22.4			
Overall						3.65	1.16	Agree

The facilitating condition latent variable was evaluated using perceived behavioral control and facilitating condition observant variables. The highest perceived behavioral control variable was “I have the necessary knowledge to use MOOCs” (mean of 3.70), followed by “I have the necessary resources to use MOOCs” (mean of 3.63). Considering the facilitating conditions, the highest response was “Using MOOCs fits my learning style” (mean of 3.49), followed by “Guidance is available to me in the selection of MOOCs” (mean of 3.47). The overall mean for perceived behavioral control was 3.67, while that of facilitating conditions was 3.47.

Absorptive Capacity

In the respondents’ reviews for social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.26. Absorptive Capacity Respondents Opinion

Absorptive Capacity	Opinion Levels					Mean	Std.	Level	
	1	2	3	4	5				
	Frequency (n), Percent (%)								
Knowledge Acquisition									
I am able to generate an environment of trust using MOOCs.	n	16	55	145	196	101	3.6	1.01	Agree
	%	3.1	10.7	28.3	38.2	19.7			
I am able to acquire information using MOOCs for my learning activities.	n	20	49	154	167	123	3.63	1.06	Agree
	%	3.9	9.6	30	32.6	24			
I am able to obtain latest knowledge in education-related issues using MOOCs	n	19	55	128	179	132	3.68	1.08	Agree
	%	3.7	10.7	25	34.9	25.7			
Knowledge Assimilation									
I am able to learn through interactive discussions forum using MOOCs	n	23	57	142	169	122	3.6	1.09	Agree
	%	4.5	11.1	27.7	32.9	23.8			
I am able to communicate my ideas regularly using MOOCs	n	22	58	142	173	118	3.59	1.08	Agree
	%	3.1	10.1	28.8	32.9	25			
I am able to assimilate research and education-related issues using MOOCs	n	16	52	148	169	128	3.66	1.05	Agree
	%	3.1	10.1	28.8	32.9	25			
Knowledge Transformation									
I am able to share important knowledge using MOOCs	n	23	49	147	159	135	3.65	1.1	Agree
	%	4.5	9.6	28.7	31	26.3			
MOOCs make it easier to share knowledge	n	20	46	134	155	158	3.75	1.1	Agree
	%	3.9	9	26.1	30.2	30.8			
Overall							3.76	1.11	Agree

The absorptive capacity was evaluated using three observant variables, knowledge acquisition, knowledge assimilation, and knowledge transformation. The response with the highest knowledge acquisition was “I am able to obtain latest knowledge in education-related issues using MOOCs” with a mean of 3.68, followed by “I am able to acquire information using MOOCs for my learning activities” (mean of 3.64). The highest knowledge assimilation was response was “I am able to assimilate research and education-related issues using MOOCs” (mean of 3.66) with an overall average of 3.62. Considering the knowledge transformation, the highest response was that “MOOCs make it easier to share knowledge” with a mean of 3.75, followed by “I am able to share important knowledge using MOOCs” (mean of 3.65). The overall mean response was 3.70.

Behavioral Intention to Use

In the respondents’ reviews for social influence latent variable, a 5-point Likert Scale was applied, where 1 = strongly disagree, 2=Disagree, 3 = neutral, 4=Agree, 5 = strongly Agree.

Table 4.27. Behavioral Intention Respondents Opinion

Behavioral Intention	Opinion Levels					mean	std. dev	Level
	1	2	3	4	5			
Intention	Frequency (n), Percent (%)					3.65	1.09	Agree
I intend to use MOOCs immediately	n 26	51	175	148	113	3.52	1.09	Agree
	% 5.1	9.9	34.1	28.8	22			
I intend to use MOOCs in future learning sessions	n 27	40	148	164	134	3.65	1.1	Agree
	% 5.3	7.8	28.8	32	26.1			
I intend to utilize MOOCs for various purposes such as self-development as well as earning credit hours	n 18	45	131	177	142	3.74	1.06	Agree
	% 3.5	8.8	25.5	34.5	27.7			
If MOOCs become more diverse in the future, I intend to use them frequently after graduation	n 27	47	132	166	141	3.69	1.12	Agree
	% 5.3	9.2	25.7	32.4	27.5			
Prediction						3.65	1.09	Agree
I predict I will use MOOCs in future learning sessions	n 21	48	136	171	137	3.69	1.08	Agree
	% 4.1	9.4	26.5	33.3	26.7			
I predict I will use MOOCs immediately	n 22	62	175	148	106	3.49	1.07	Agree
	% 4.3	12.1	34.1	28.8	20.7			
	n 20	43	146	154	150	3.72	1.09	Agree

	Opinion Levels					mean	std. dev	Level	
	1	2	3	4	5				
Behavioral Intention	Frequency (n), Percent (%)								
I predict I will utilize MOOCs for various purposes such as self-development as well as earning credit hours	%	3.9	8.4	28.5	30	29.2			
If MOOCs become more diverse in the future, I predict I will use them frequently after graduation	n	24	47	130	170	142	3.69	1.1	Agree
	%	4.4	8.7	24	31.4	26.2			
Planning							3.63	1.10	Agree
I plan to use MOOCs in future learning sessions	n	19	48	134	172	140	3.71	1.08	Agree
	%	4.7	9.2	25.3	33.1	27.7			
I plan to use MOOCs immediately	n	35	44	166	147	121	3.53	1.14	Agree
	%	3.7	9.4	26.1	33.5	27.3			
I plan to utilize MOOCs for various purposes such as self-development as well as earning credit hours	n	24	44	144	171	130	3.66	1.08	Agree
	%	4.7	8.6	28.1	33.3	25.3			
If MOOCs become more diverse in the future, I plan to use them frequently after graduation	n	25	42	151	171	124	3.63	1.08	Agree
	%	4.9	8.2	29.4	33.3	24.2			
Overall							3.66	1.03	Agree

Considering the intention observant variable, the highest intention response was “I intend to utilize MOOCs for various purposes such as self-development as well as earning credit hours” which had a mean of 3.74, followed by “If MOOCs become more diverse in the future, I intend to use them frequently after graduation” which had a mean of 3.69. The overall mean for intention was 3.65. Considering the prediction observant variable, the highest response was “I predict I will utilize MOOCs for various purposes such as self-development as well as earning credit hours” (mean of 3.72), followed by “If MOOCs become more diverse in the future, I predict to use them frequently after graduation” (mean of 3.69). The overall mean for prediction was 3.65. Lastly, the highest planning response was “I plan to use MOOCs in future learning sessions” with a mean of 3.71, followed by “I plan to use MOOCs for various purposes such as self-development as well as earning credit hours” (mean of 3.66). The overall planning mean was 3.63.

Culture

Table 4.28. Culture Respondents Opinion

		1	2	3	4	5	Mean	Std. Dev	Level
Individualism/Collectivism							3.63	1.08	Agree
I get better learning results when I study as a MOOC group member than when I study independently on my own	n	24	42	168	174	105	3.57	1.05	Agree
	%	4.7	8.2	32.7	33.9	20.5			
Group success is more important than individual success while studying MOOCs	n	22	48	160	149	134	3.63	1.10	Agree
	%	4.3	9.4	31.2	29	26.1			
Group loyalty should be encouraged even if individual goals suffer while studying MOOCs	n	22	45	150	157	139	3.67	1.09	Agree
	%	4.3	8.8	29.2	30.6	27.1			
Uncertainty Avoidance							3.73	1.04	Agree
Studying MOOCs, rules and regulations are important because they inform me what is expected of me	n	12	46	160	163	132	3.70	1.02	Agree
	%	2.3	9	31.2	31.8	25.7			
Studying the order and structure of MOOCs learning modules is important	n	13	44	156	161	139	3.72	1.03	Agree
	%	2.5	8.6	30.4	31.4	27.1			
It is important to have detailed learning outcomes in details so that I always know what I'm expected to study	n	12	29	149	191	132	3.78	0.97	Agree
	%	2.3	5.7	29	37.2	25.7			
It is important to follow MOOCs instructions and procedures closely	n	14	36	145	160	158	3.80	1.04	Agree
	%	2.7	7	28.3	31.2	30.8			
Standardized work procedures are helpful when studying with MOOCs	n	20	30	151	171	141	3.75	1.04	Agree
	%	3.9	5.8	29.4	33.3	27.5			
Learners should avoid shift to using MOOCs because it is a better learning tool	n	27	43	160	148	135	3.63	1.12	Agree
	%	5.3	8.4	31.2	28.8	26.3			

The culture variable was evaluated using two observant variables – individualism/collectivism and uncertainty avoidance. For the individualism/collectivism, the response with the highest score was “Group loyalty should be encouraged even if individual goals suffer while studying MOOCs” with a mean of 3.73, while the one with

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

the least is “I get better learning results when I study as a MOOC group member than when I study independently on my own” with a mean of 3.63. The overall score for individualism/collectivism was 3.63, with a standard deviation of 1.05. For the uncertainty avoidance, the highest response was “It is important to follow MOOCs instructions and procedures closely” with a mean of 3.80, and the one with the least response was “Standardized work procedures are helpful when studying with MOOCs” with a mean of 3.63. The overall uncertainty avoidance mean was 3.73.

4.3.3 Test for Normality and Correlation Analysis for Pakistan

This section presents the results of the normality tests, evaluated using the skewness and kurtosis criteria, and the correlation analysis of the variables.

Test for Normality

This section evaluated whether the latent variables were normally distributed. There were eight latent variables measured by different observant variables. The variables were: performance expectance measured by three variables (perceived usefulness, relative advantage, and outcome expectancy); effort expectancy measured by two observed variables (perceived ease of use, Ease of use); Social influence measured by two variables (General social influence and Peer Social Influence); Facilitating Condition measured by two observed variables (Perceived behavioral control and Facilitating condition); Absorptive Capacity measured by two observed variables (Knowledge acquisition, Knowledge assimilation, and Knowledge transformation); Perceived autonomy measured by three observed variables (Sense of responsibility, Self-confidence, and Freedom); Behavioral Intention to use measured by three variables (Intention, Prediction, and Planning); and culture measured by two observed variables (Uncertainty avoidance and individualism/collectivism). The average skewness and kurtosis for each observed variable in the latent variables are presented in Table 4.26 below, and the overall skewness and kurtosis are in Appendix D.

Table 4.29. Test for Normality

	Skewness	Kurtosis	Normal Distribution
Performance Expectancy	-0.47527	-0.43855	✓
Effort Expectancy	-0.51967	-0.31633	✓
Social Influence	-0.38133	-0.464	✓
Facilitating Conditions	-0.43883	-0.50567	✓
Behavioral Intention to Use	-0.5335	-0.30058	✓
Absorptive Capacity	-0.50625	-0.35788	✓
Perceived Autonomy	-0.48038	-0.32525	✓
Culture	-0.502	-0.25911	✓

Considering the case of Pakistan, the first latent variable was performance expectancy, which was measured by three variables (perceived usefulness, relative advantage and outcome expectancy). Performance expectancy measured by two variables skewness ranged from -0.668 to -0.252, and kurtosis ranged from -0.597 to -0.18. Effort Expectancy measured by two variables skewness ranged from -0.621 to -0.372 while kurtosis ranged from -0.587 to 0.021. Social influence measured by two variables skewness ranged from -0.307 to -0.457, while kurtosis ranged from -0.539 to -0.307. Facilitating conditions measured by two variables skewness ranged from -0.334 to -0.606, while kurtosis ranged from -0.606 to -0.265. Behavioral intention to use was measured by three variables, and its skewness ranged from -0.608 to -0.296, and kurtosis ranged from -0.502 to -0.193. Absorptive capacity was evaluated using three variables, and its skewness ranged from -0.596 to -0.472, and kurtosis ranged from -0.417 to -0.238. Perceived autonomy was measured using three variables, and its skewness ranged from -0.572 to -0.395, while kurtosis ranged from -0.402 to -0.224. The culture was measured using two variables, and ranged from -0.613 to -0.395, while kurtosis ranged from -0.435 to -0.013. The results above for skewness and kurtosis satisfy the normality assumption because all the variables skewness is not above 0.75, and kurtosis is not above 1.5 (Hooland, 1998). Since the data satisfied that normality test, it was considered suitable to be used in carrying out the Structural Equation Model Analysis (SEM).

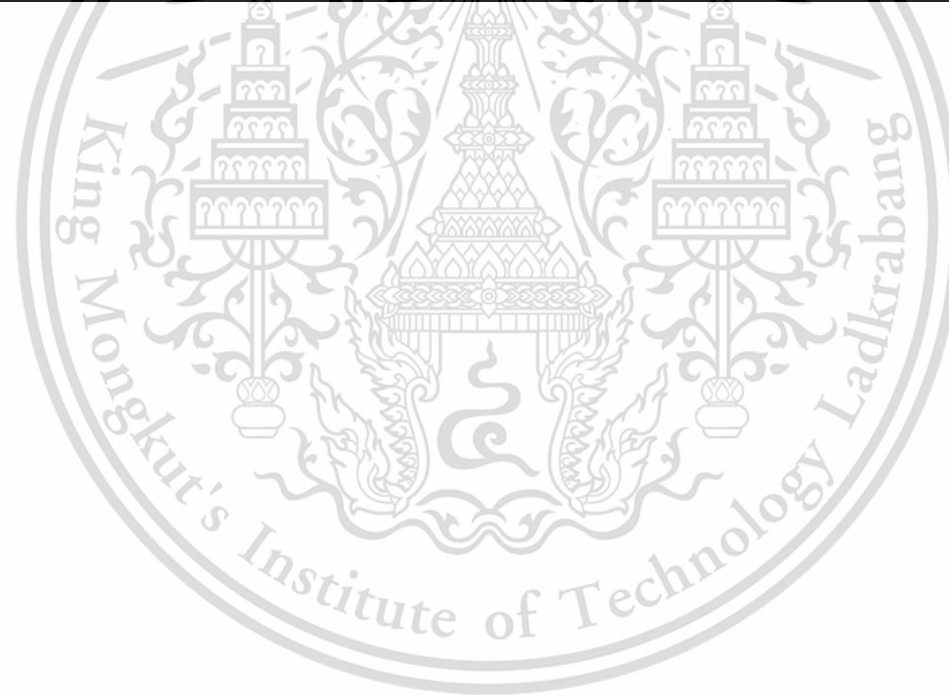
4.3.4 Correlation Analysis for Pakistan

The correlation analysis evaluates the relationship between variables. Table 4.27 presents the correlation analysis of the observed variables of the latent variables. The correlation coefficient of the performance expectancy ranged from 0.71 to 0.72; the correlation coefficient for the effort expectancy observed variables was 0.67; the correlation coefficient for social influence observed variables was 0.56; the correlation coefficient for facilitating conditions observed variables was 0.60; the correlation coefficient for absorptive capacity observed variables ranged between 0.73 to 0.80; the correlation coefficient for perceived autonomy observed variables ranged from 0.76 to 0.78; the correlation coefficient for behavioral intention to use observed variables ranged from 0.77 to 0.80; the correlation coefficient for culture observed variables was 0.75. From the statistics presented above, the correlation among these variables is satisfactory because the correlation coefficient is not below 0.3, indicating the suitability of the variables to be used in SEM. Additionally, the correlation coefficient was not above the threshold of 0.8, which indicates the absence of multicollinearity.

Table 4.30: Pakistan Correlation Analysis

	PU	RA	OE	PE O	EO U	GSI	PSI	PB C	FC	IN	PR	PL	Kac	Kas	KT r	SR	SC	FR D	I/C	UA
PU	1.00																			
RA	0.72	1.00																		
OE	0.72	0.71	1.00																	
PEO	0.62	0.62	0.67	1.00																
EOU	0.62	0.60	0.77	0.79	1.00															
GSI	0.52	0.50	0.53	0.54	0.53	1.00														
PSI	0.40	0.46	0.50	0.40	0.38	0.57	1.00													
PBC	0.60	0.51	0.55	0.63	0.57	0.66	0.40	1.00												
FC	0.60	0.57	0.55	0.62	0.63	0.58	0.55	0.60	1.00											
IN	0.60	0.54	0.66	0.62	0.59	0.60	0.55	0.59	0.60	1.00										
PR	0.60	0.53	0.66	0.59	0.58	0.60	0.55	0.59	0.60	0.79	1.00									
PL	0.55	0.53	0.66	0.61	0.57	0.57	0.55	0.60	0.77	0.78	0.80	1.00								
Kac	0.62	0.53	0.66	0.61	0.60	0.55	0.55	0.59	0.60	0.60	0.77	0.77	1.00							
Kas	0.62	0.53	0.66	0.58	0.57	0.55	0.55	0.54	0.60	0.60	0.77	0.77	0.80	1.00						
KTr	0.52	0.53	0.66	0.58	0.57	0.55	0.55	0.60	0.60	0.60	0.77	0.77	0.77	0.77	1.00					

	PU	RA	OE	PE O	EO U	GSI	PSI	PB C	FC	IN	PR	PL	Kac	Kas	KT r	SR	SC	FR D	I/C	UA
SR	0.5	0.5	0.6			0.5	0.5		0.6	0.6	0.7	0.7	0.7	0.7	0.7	1.0				
	5	5	0	0.63	0.56	1	1	0.54	3	8	0	3	3	3	1	0				
SC	0.6	0.5	0.5			0.5	0.5		0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.7	1.0			
	1	4	8	0.60	0.60	3	3	0.56	8	9	0	1	4	6	9	6	0			
FR	0.6	0.5	0.6			0.5	0.5		0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7			
D	2	6	0	0.62	0.58	3	2	0.58	4	4	4	4	4	2	1	8	8	1.00		
I/C	0.5	0.5	0.6			0.5	0.5		0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.7	0.7		1.0	
	4	1	0	0.60	0.55	2	3	0.59	1	3	9	2	0	2	9	2	1	0.71	0	
UA	0.6	0.5	0.6			0.5	0.5		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7		0.7	1.0
	3	6	5	0.63	0.59	4	1	0.63	1	7	8	9	7	3	3	5	2	0.78	5	0



4.3.5 Measurement of the Model for Pakistan

The measurement of the model was conducted using two methods, the confirmatory factor analysis (CFA) and the validity and reliability analysis.

First Order CFA Model for Pakistan

CFA Analysis – Performance Expectancy Variable

The first CFA model for Pakistan evaluated the validity of the performance expectancy three observed variables; Perceived Usefulness (PU), Relative Advantage (RA) and Outcome Expectation (OE). As presented in figure 4.13 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, relative advantage (RA) had the highest factor weight of 0.87, perceived usefulness (PU) was second in rank with a factor weight of 0.84, and the last one was outcome expectation (OE) with a factor weight of 0.83 respectively. The factor weights were statistically significant at 0.05 level of significance.

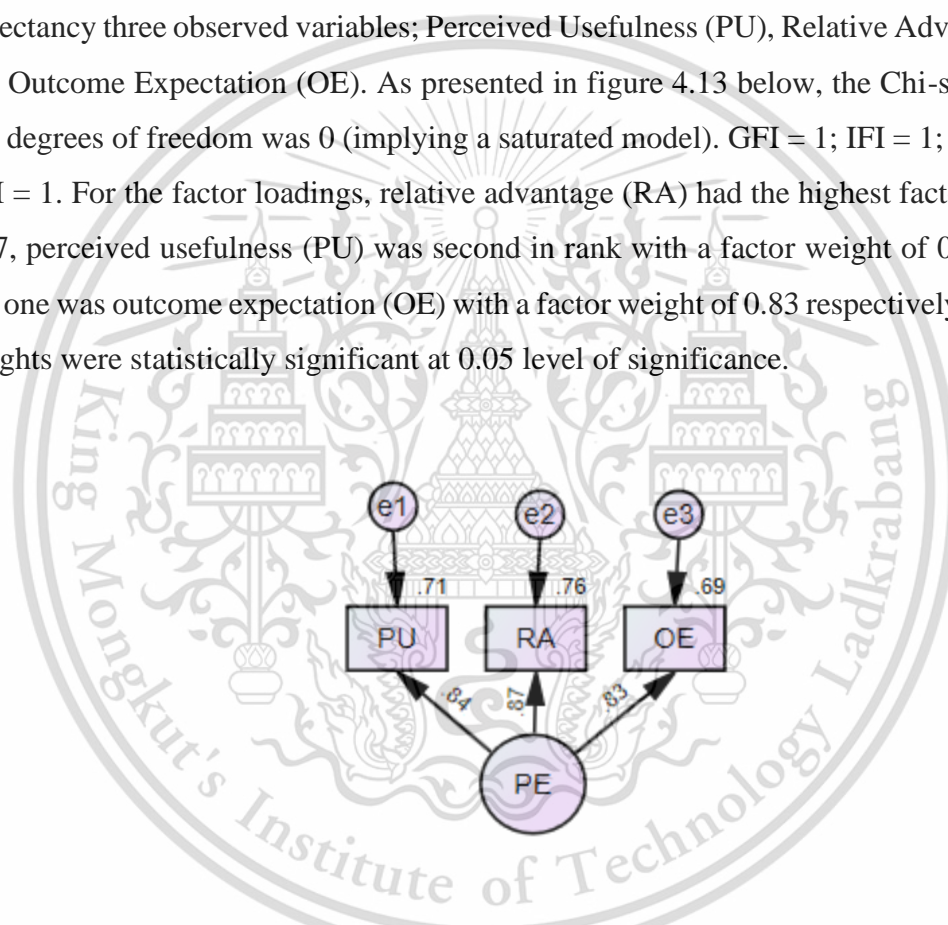


Figure 4.13. CFA Analysis – Performance Expectancy Variable

CFA Analysis – Effort Expectancy Variable

The second CFA model evaluated the validity of the effort expectancy two observed variables; Ease of Use (EU) and Perceived Ease of Use (PEU). As presented in figure 4.14 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, perceived

ease of use (PEU) had the highest factor weight of 0.86 ease of use (EU) factor weight was of 0.79 each. The factor weights were statistically significant at 0.05 level of significance.

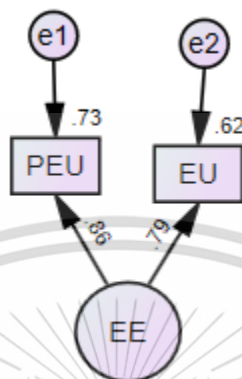


Figure 4.14. CFA Analysis – Effort Expectancy Variable

CFA Analysis – Perceived Autonomy Variable

The third CFA model evaluated the validity of the perceived autonomy variable with three observed variables namely freedom, self-confidence (SC) and sense of responsibility (SR). As presented in figure 4.15 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, self-confidence had the highest factor weight of 0.90 while freedom and sense of responsibility (SR) had similar factor weights of 0.86 each. The factor weights were statistically significant at 0.05 level of significance.

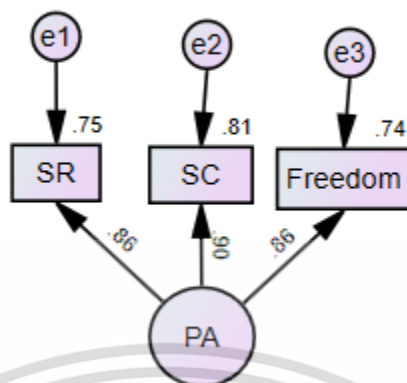


Figure 4.15. CFA Analysis – Perceived Autonomy Variable

CFA Analysis – Social Influence Variable

The fourth CFA model evaluated the validity of the social influence variable with two observed variables namely Perceived Social Influence (PSI) and General Social Influence (GSI). As presented in figure 4.16 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, general social influence (GSI) had the highest factor weight of 0.90 followed by perceived social influence (PSI) with a factor loading of 0.83. The factor weights were statistically significant at 0.05 level of significance.

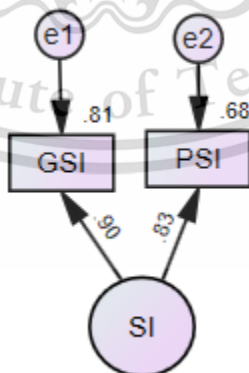


Figure 4.16. CFA Analysis – Social Influence Variable

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

CFA Analysis – Facilitating Conditions Variable

The fifth CFA model evaluated the validity of the facilitating conditions variable with two observed variables namely Facilitating Conditions (FC) and Perceived Behavioural Control (PBC). As presented in figure 4.17 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, perceived behavioral control (PBC) had the highest factor weight of 0.82 followed by facilitating conditions (FC) with a factor loading of 0.81. The factor weights were statistically significant at 0.05 level of significance.

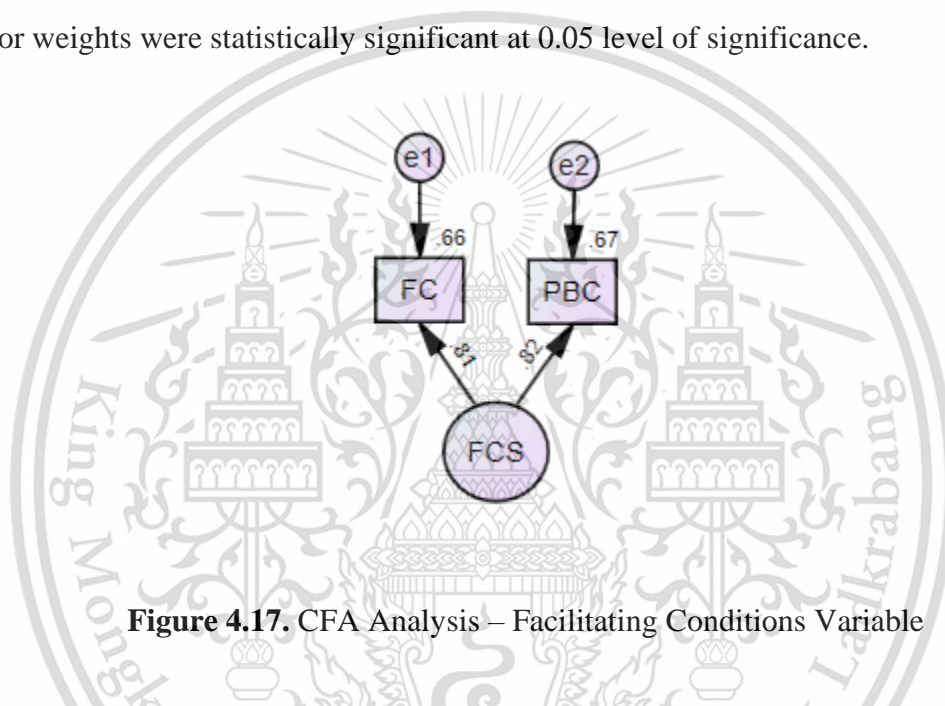


Figure 4.17. CFA Analysis – Facilitating Conditions Variable

CFA Analysis – Absorbed Capacity Variable

The sixth CFA model evaluated the validity of the absorbed capacity variable with three observed variables namely Knowledge Transformation, Knowledge Assimilation, Knowledge Acquisition. As presented in figure 4.18 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, knowledge assimilation (KAss) had the highest factor weight of 0.92 followed by knowledge acquisition (KAaq) with a factor weight of 0.86 and the last one was knowledge transformation (KTrans) with a factor weight of 0.84. The factor weights were statistically significant at 0.05 level of significance.

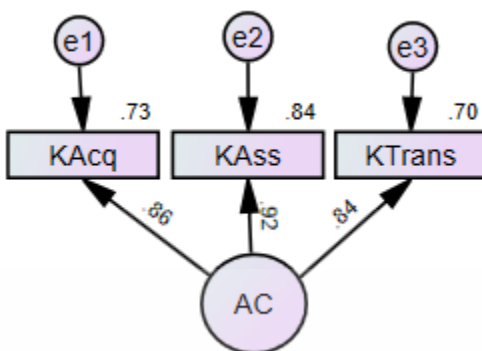


Figure 4.18. CFA Analysis – Absorbed Capacity Variable

CFA Analysis – Behavioral Intention to use Variable

The seventh CFA model evaluated the validity of the absorbed capacity variable with three observed variables namely Intention to use, Prediction to use, Planning to use. As presented in figure 4.19 below, the Chi-square was 0 and degrees of freedom was 0 (implying a saturated model). GFI = 1; IFI = 1; CFI = 1 and NFI = 1. For the factor loadings, prediction to use had the highest factor weight of 0.97 followed by planning to use with a factor weight of 0.88 and the last one was intention to use with a factor weight of 0.86 respectively. The factor weights were statistically significant at 0.05 level of significance.

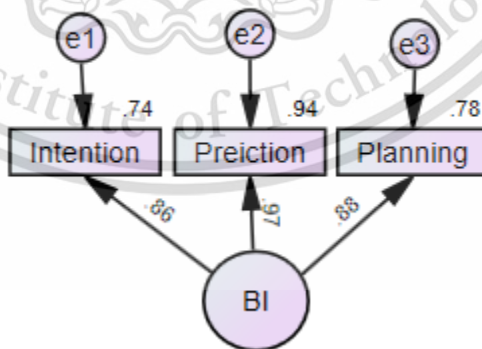


Figure 4.19. CFA Analysis – Behavioral Intention to use Variable

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

The model fitness was evaluated using the Confirmatory Factor Analysis (CFA) for the seven latent variables used in the study. These variables are performance expectancy (PE), effort expectancy (EE), perceived autonomy (PA), social influence (SI), facilitating condition (FC), absorptive capacity (AC), and behavioral intention to use (BI). The CFA for Pakistan and the results are presented below. The measurement model applied is shown below

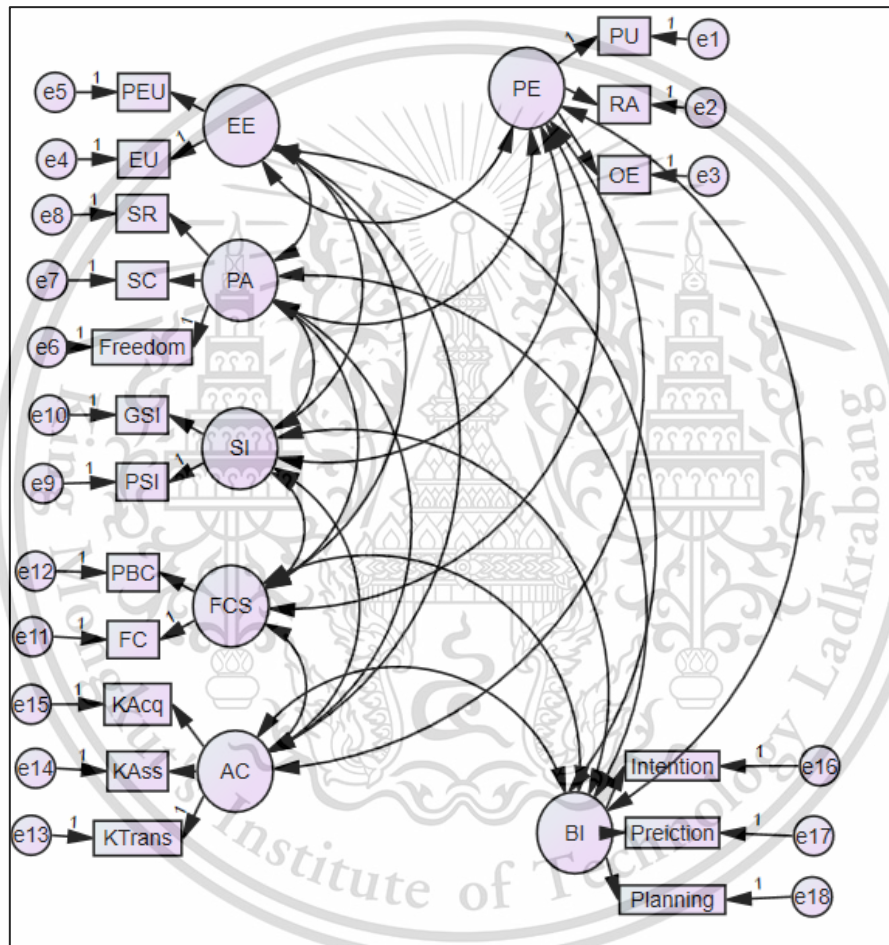


Figure 4.20. Measurement Model of Factors Involving Behavioral Intention

Figure 4.2 below shows the standardized estimates of the loadings and the r-squared values of the indicator variables. The CFA model fitness criteria indicate that the initial model fits well with the data.

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

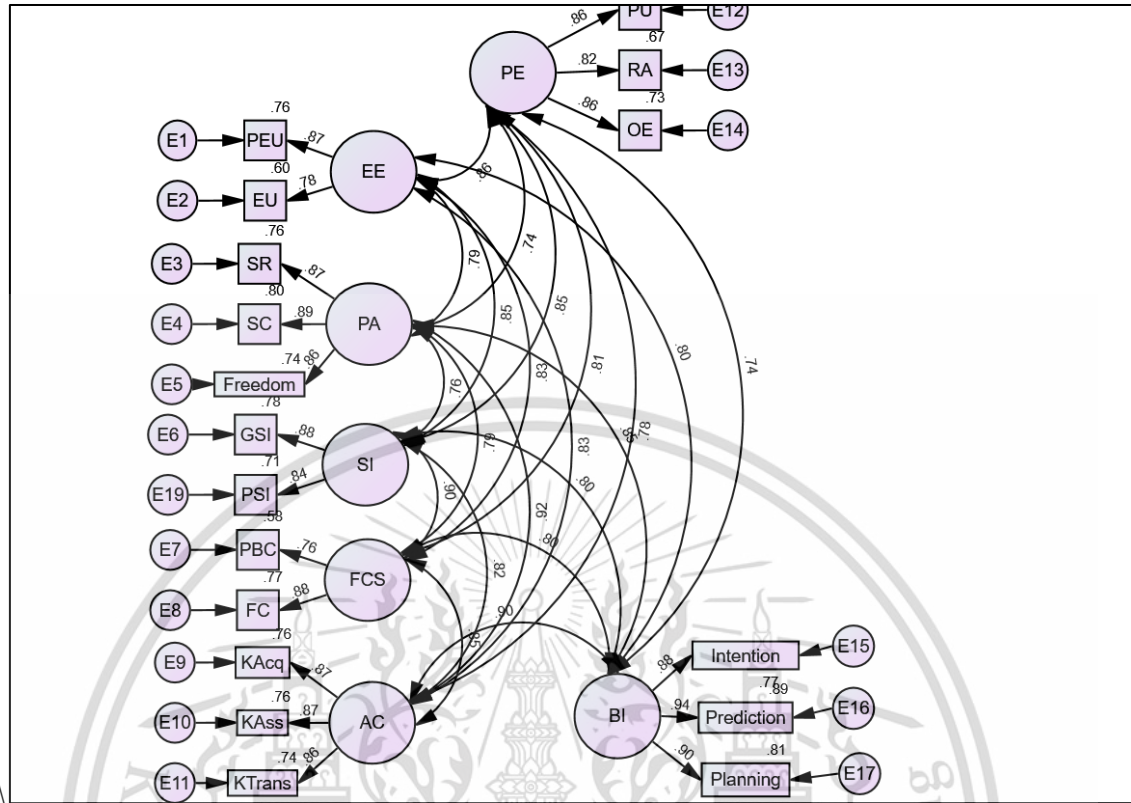


Figure 4.21. CFA for Pakistan

The hypothesized model appears to be a good fit for the data. The chi-square statistic for the model was significant ($\chi^2 [114] = 458.643, p < 0.01$), while the more practical alternative, the χ^2/df ratio = 4.023 (considered acceptable since it was below 5 and was being influenced by sample size) (Schumacker & Lomax, 2004; Hu & Bentler, 1999;). The CFI is 0.96; TLI is 0.947; NFI is 0.948, which provided an excellent fit since the values were greater than 0.9 or close to 1.0. Additionally, the RMSEA is 0.077 (below the threshold of 0.80) (Browne & Cudeck, 1993; Schumacker & Lomax, 2010). The results of the CFA for Pakistan data indicated that it was feasible to move on and conduct the multi-group Structural Equation Modeling (SEM). The fit indices are summarized in the table below.

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Table 4.31. CFA Fit Indices for Pakistan

Indices	Criteria	Statistics Value
CMIN/DF	<5	4.023
GFI	≥ 0.90	0.910
NFI	≥ 0.90	0.948
IFI	≥ 0.90	0.961
CFI	≥ 0.90	0.96
RMR	<0.08	0.030
RMSEA	<0.08	0.077
Conclusion		Model Fit

In addition to the evaluation of the model fitness, the factor loadings of the CFA were also evaluated to determine how the observed variables contributed to the effect of the latent variables. The table below presents the factor loadings of the observed variables, their t-values, whether significant or not, as well as squared multiple correlation values. The results are discussed in this section.

Considering the Performance expectancy (PE) latent variable, Perceived usefulness (PU) was found to have the highest factor loading score of 0.86 and a square multiple correlation of 0.74, which explained approximately 74% of Performance expectancy variation. It was followed by Outcome Expectation (OE), having a factor loading score of 0.857 and a square multiple correlation of 0.734, which explained approximately 73% of Performance expectancy variation. The last one was Relative Advantage (RA) which had a factor loading score of 0.821 with a squared multiple correlation of 0.674, accounting for 67% variation in PE.

Considering the Effort expectancy (EE) latent variable, Perceived Ease of Use (PEU) was found to have the highest factor loading score of 0.87 and a square multiple correlation of 0.756, which explained approximately 76% of effort expectancy variation. It was followed by Ease of Use (EU), having a factor loading score of 0.777 and a square multiple correlation of 0.604, which explained approximately 60% variation.

For the Perceived Autonomy (PA), self-confidence had the highest factor loading score of 0.894 and a square multiple correlation of 0.799, which explained approximately 80% variation. It was seconded by the freedom with a factor loading score of 0.861 and a square multiple correlation of 0.742 which explained approximately 74% of perceived autonomy variation. The last one was social responsibility (SR), having a factor loading score of 0.873 and a square multiple correlation of 0.762, which explained approximately 76% variation.

Considering the Social Influence (SI) latent variable, General Social Influence (GSI) was found to have the highest factor loading score of 0.881 and a square multiple correlation of 0.776, which explained approximately 78% of effort expectancy variation. It was followed by Peer Social Influence (PSI), having a factor loading score of 0.843 and a square multiple correlation of 0.711, which explained approximately 71% variation.

For the Facilitating Conditions (FCS) latent variable, facilitating condition (FC) was found to have the highest factor loading score of 0.878 and a square multiple correlation of 0.771, which explained approximately 77% of effort expectancy variation. It was followed by perceived behavioural control (PBC) having a factor loading score of 0.76 and a square multiple correlation of 0.578, which explained approximately 58% variation.

For the Absorptive capacity (AC) variable, knowledge assimilation (KAss) was found to have the highest factor loading score of 0.873 and a square multiple correlation of 0.764, which explained approximately 76% of variation. It was followed by knowledge acquisition (KAaq) having a factor loading score of 0.873 and a square multiple correlation of 0.762, which explained approximately 76% variation. The last one was knowledge transformation (KTrans) having a factor loading score of 0.863 and a square multiple correlation of 0.744, which explained approximately 74% variation.

Considering the behavioural intention (BI) latent variable, the prediction was found to have the highest factor loading score of 0.943 and a square multiple correlation of 0.89, which explained approximately 89% of variation. It was followed by planning having a factor loading score of 0.904 and a square multiple correlation of 0.897, which explained approximately 90% variation. The last one was intention having a factor loading score of

0.88 and a square multiple correlation of 0.774, which explained approximately 77% variation.

Table 4.32. CFA Factor Loadings for Pakistan

Variables		Factor Loading			t	Squared R
Latent Variable	Observed Variable	Estimate	S.E.	BETA		
PE	PU	1.000		0.86		0.74
	RA	1.118	0.049	0.821	22.836	0.674
	OE	1.064	0.044	0.857	24.430	0.734
	CR = 0.883; AVE = 0.716					
EE	EU	1.000		0.777		0.604
	PEU	1.071	0.052	0.87	20.470	0.756
	CR = 0.809; AVE = 0.68					
PA	Freedom	1.000		0.861		0.742
	SC	1.076	0.039	0.894	27.421	0.799
	SR	1.008	0.038	0.873	26.285	0.762
	CR = 0.908; AVE = 0.768					
SI	PSI	1.000		0.843		0.711
	GSI	0.991	0.040	0.881	24.580	0.776
	CR = 0.853; AVE = 0.743					
FCS	FC	1.000		0.878		0.771
	PBC	0.920	0.046	0.76	20.033	0.578
	CR = 0.805; AVE = 0.674					
AC	KTrans	1.000		0.863		0.744
	KAss	0.967	0.036	0.874	26.783	0.764
	KAcq	0.925	0.035	0.873	26.719	0.762
	CR = 0.903; AVE = 0.757					
BI	Intention	1.000		0.88		0.774
	Prediction	1.069	0.032	0.943	33.168	0.89
	Planning	1.045	0.035	0.897	29.729	0.805
	CR = 0.933; AVE = 0.823					

Validity and Reliability Analysis

The reliability and validity of the model constructs were evaluated in this section. The reliability was evaluated using Fornell and Larcker (1981) criteria that the Convergent Reliability (CR) of every construct should be equal to or higher than 0.70, (which satisfies the act that all the items were able to accurately measure the factors (Nunnally

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& Bernstein, 1994), and the average variance extracted (AVE) should be equal to or higher than 0.50 (Segars, A. H. (1997). The CR and AVE for the Pakistan data are presented in the table below.

Table 4.33. Validity and Reliability Results

Variables	Pakistan	
	CR	AVE
BI	0.933	0.823
EE	0.809	0.680
PA	0.908	0.768
SI	0.853	0.743
FCS	0.805	0.674
AC	0.903	0.757
PE	0.883	0.716

From the table above, the CR for Pakistan ranged between 0.805 – 0.933, while the AVE ranged between 0.674 – 0.823. From the results, all factor loading, CR, and AVE values meet the recommended norms and standards, meaning that the proposed construct convergence validity of the measurement model.

4.3.6 Research result of empirically determining the effects of behavioral intention to use MOOCs in Pakistan

Structural Equation Modelling (SEM) for Pakistan

This section was carried out to address the first objective of the study “To empirically determine the effect of culture on behavioral intention to use MOOCs in Pakistan” which was addressed by conducting SEM analysis.

Initial Models

After establishing the fitness of the model, the structural equation model was developed. These initial models served as the subsequent models for testing moderating effects. In this research, there were two types of moderation effects that were performed:

- c) The moderation effects of culture variable on the relationship between the independent variables and the dependent variable.
- d) The multi-group SEM analysis, where the country (Thailand and Pakistan) was used as the two groups to compare the relationship between the variables.

Prior to conducting the multi-group analysis with the categorical variable of Pakistan and the moderation effect of the culture variable, the SEM model for Pakistan was conducted, and the path analysis is presented in the following section.

Initial SEM Analysis for Pakistan

Overview of Terms

The Structural Equation Modelling (SEM) was applied to evaluate the effects of various variables on the Behavioral intention to use MOOCs in Pakistan. The variables applied were both latent variables and observed variables. The table below shows the symbols used to represent the variables and their relationship.

Table 4.34. Overview of Terms




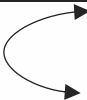
Symbol	Meaning
	Latent Variable
	Observed Variable
	Causal Relationship
	Non-causal relationship

Table 4.35. Variables used for SEM analysis

Variables Symbol		
Latent Variable	Observed Variable	Variable Names
PE	PU	Performance Expectancy Perceived Usefulness

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Variables	Symbol	
	RA	Relative Advantage
	OE	Outcome Expectation
EE	EU	Effort Expectancy
	PEU	Ease of Use Perceived Ease of Use
PA	Freedom	Perceived Autonomy Freedom
	SC	Self Confidence
	SR	Sense of Responsibility
SI	PSI	Social Influence Perceived Social Influence
	GSI	General Social Influence
FCS	FC	Facilitating Conditions
	PBC	Facilitating Conditions Perceived Behavioral Control
AC	KTrans	Absorbed Capacity Knowledge Transformation
	KAss	Knowledge Assimilation
	KAcq	Knowledge Acquisition
BI	Intention	Behavioral Intention Intention to use
	Prediction	Prediction to use
	Planning	Planning to use

Based on the review of the literature and with reference to the developed hypothesis of the study, the following model frame for SEM was developed.

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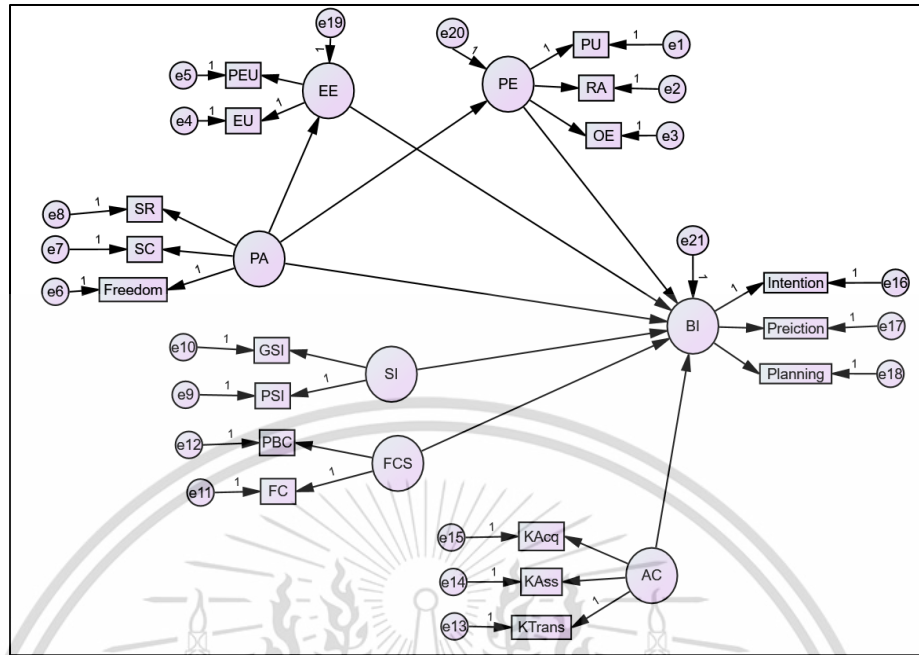


Figure 4.22. Model framework developed for SEM

After the analysis of the SEM model for Pakistan, the following SEM model output was obtained.

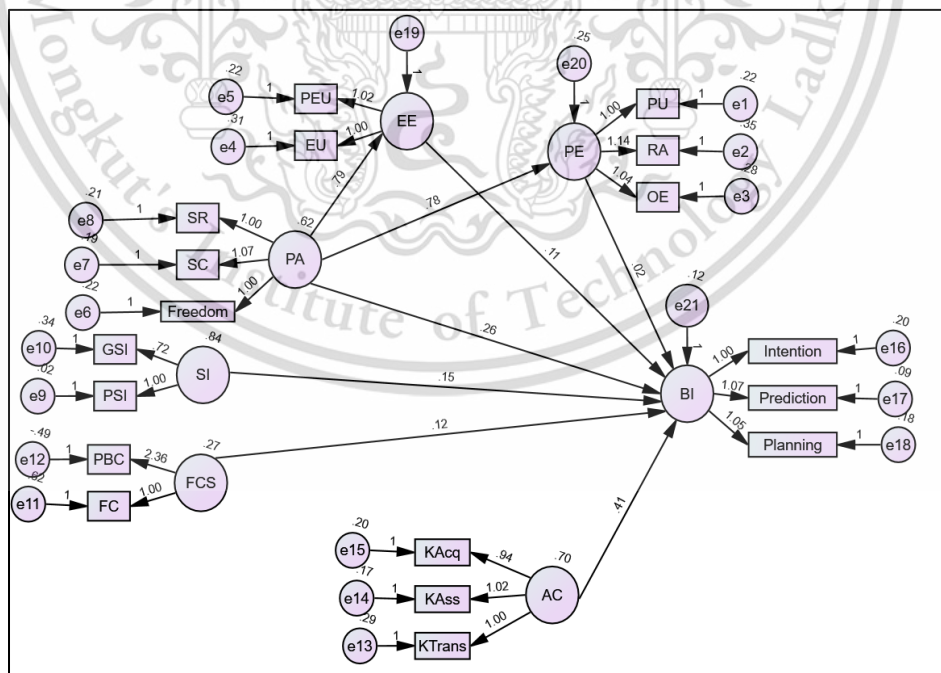


Figure 4.23. Initial SEM Analysis for Pakistan

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า ไม่ว่าจะกรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Presented above are the path analysis results with the standardized estimates of the loadings and the r-squared values of the indicator variables. The SEM model fitness was evaluated, and the following results were obtained. The chi-square statistic for the model was significant ($\chi^2 [121] = 580.178, p < 0.01$), while the more practical alternative, the χ^2/df ratio = 4.795 was below five and was influenced by the sample size (Schumacker, Lomax & Schumacker, 2015; Hu & Bentler, 1999). The CFI was 0.936; TLI was 0.919; NFI was 0.923, which provided an excellent fit since the values were greater than 0.9 or close to 1.0. Considering that all the other thresholds were above 0.9 and GFI would round off to 0.9, the model was considered satisfactory. Additionally, the RMSEA was 0.075 (below the threshold of 0.80) (Browne & Cudeck, 1992; Schumacker, Lomax & Schumacker, 2015). These results indicated that the model had a good fit and, therefore good for conducting SEM analysis.

Table 4.36. Fit Indices for SEM for Pakistan

Indices	Criteria	Statistics Value
CMIN/DF	<5	4.795
GFI	≥ 0.90	0.860
NFI	≥ 0.90	0.923
IFI	≥ 0.90	0.936
CFI	≥ 0.90	0.936
RMR	<0.08	0.043
RMSEA	<0.08	0.075
Conclusion		Model Fit

The path relationship between the endogenous and exogenous variables is shown in Table 4.37 below.

Regression Weights: (Group number 1 - Default model)

Table 4.37. Path Analysis Regression Weights for Pakistan

	Estimate	S.E.	C.R.	P-value	Label
Direct Effects					
PE <--- PA	.780	.045	17.517	***	
EE <--- PA	.791	.046	17.022	***	
BI <--- PA	.256	.075	3.403	***	

			Estimate	S.E.	C.R.	P-value	Label	
BI	<---	FCS	.117	.031	3.831	***		
BI	<---	EE	.106	.066	1.596	.110		
BI	<---	PE	.022	.045	.496	.620		
BI	<---	AC	.412	.029	14.092	***		
BI	<---	SI	.153	.027	5.617	***		
Indirect Effects								
BI	<---	EE	<---	PA	0.084	-0.060	0.219	0.322
BI	<---	PE	<---	PA	0.018	-0.067	0.110	0.683

Note: *** significant at 0.01; BI = Behavioral intention to use; PE = Performance Expectancy; EE = Effort expectancy; PA = Perceived Autonomy; SI = Social Influence; FSC = Facilitating Conditions; AC = Absorptive Capacity

The analysis of the above findings shows that four variables have a significant and positive effect on behavioral intention to use (BI), which are PA, FCS, AC, and SI. PA was found to have a positive and significant effect on BI ($\beta = 0.256$, $p < 0.01$), FCS has a positive and significant effect on BI ($\beta = 0.117$, $p < 0.01$), FCS has a positive and significant effect on BI ($\beta = 0.412$, $p < 0.01$), AC has a positive and significant effect on BI ($\beta = 0.153$, $p < 0.01$), SI has a positive and significant effect on BI ($\beta = 0.155$, $p < 0.01$). However, the results indicated that PE and EE have a non-significant effect on BI. As well, PA have a positive and significant effect on PE ($\beta = 0.780$, $p < 0.01$), and EE ($\beta = 0.791$, $p < 0.01$).

4.3.7 Direct, Indirect, and Total Effects

The results of the direct, indirect, and total effects of the various variables on behavioral intention to use are shown in the sections below

Direct effects

The direct effects considered in the analysis were from the effect of PA, FSC, EE, PE, AC and SI on BI which has the following coefficients as 0.117, 0.106, 0.022, 0.412, 0.153 respectively.

Indirect Effects

The indirect effects considered in the analysis was from the PA to BI whose value, as shown in the table below was 0.101

Total Effects

The total effects were found for all the variables PA, FSC, EE, PE, AC, and SI on their effect on BI, whose coefficients, as presented in the figure below, include 0.117, 0.106, 0.022, 0.412, and 0.153 respectively.

Table 4.38. Direct, Indirect, and Total Effects

			Direct Effects	Indirect Effects	Total Effects
BI	<---	PA	0.256	0.101 (0.791*0.106)+(0.780*0.022)	0.357 (0.101+0.256)
BI	<---	FCS	0.117	-	0.117
BI	<---	EE	0.106	-	0.106
BI	<---	PE	0.022	-	0.022
BI	<---	AC	0.412	-	0.412
BI	<---	SI	0.153	-	0.153

4.3.8 Research result of empirically determining the moderation effect of culture on behavioral intention to use MOOCs in Pakistan

Moderation effects of culture variable for Pakistan

This section was carried out to address the second objective of the study “To empirically determine the moderation effect of culture on behavioral intention to use MOOCs in Pakistan” which was addressed by conducting CFA moderating analysis with culture as the variable.

In this analysis, there were eight variables, the independent variables (performance expectancy, effort expectancy, social influence, facilitating conditions, absorptive capacity, and perceived autonomy), the dependent variable (behavioral intention to use MOOC), and moderating variable (culture).

Pakistan Moderation Analysis

The interaction between the independent variables (performance expectancy, effort expectancy, social influence, facilitating conditions, absorptive capacity, and perceived

autonomy) with the moderator variables (culture) was calculated using the variables standardized values. The model and results are presented in the figure below.

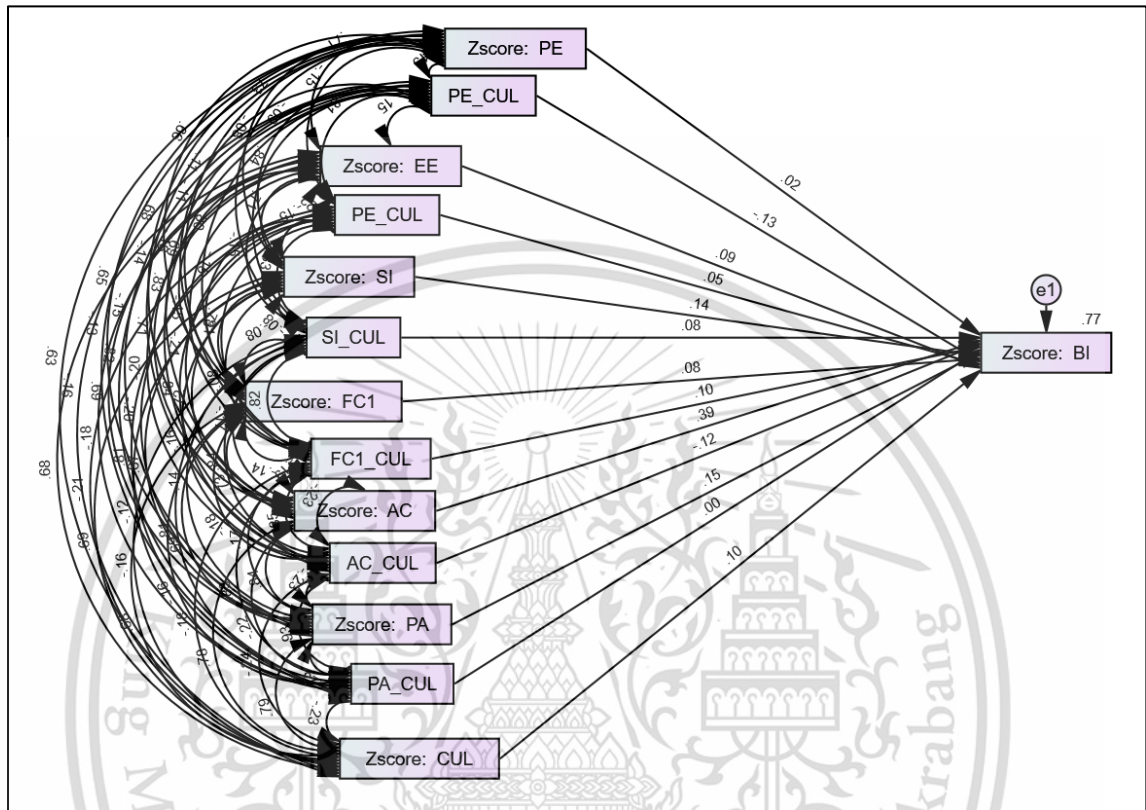


Figure 4.24. Pakistan Moderation Analysis

Table 4.39. Pakistan Moderation Analysis

			Estimate	S.E.	C.R.	P	Label
Direct Effects							
ZBI	<---	ZSI	.137	.039	3.531	***	
ZBI	<---	ZFC1	.084	.036	2.322	**	
ZBI	<---	ZAC	.394	.046	8.650	***	
ZBI	<---	ZPA	.146	.044	3.332	***	
ZBI	<---	ZCUL	.101	.039	2.580	**	
ZBI	<---	ZEE	.085	.036	2.345	**	
ZBI	<---	ZPE	.018	.036	.490	.624	
Interaction Effects							
ZBI	<---	PE_CUL	-.101	.036	-2.834	***	
ZBI	<---	EE_CUL	.040	.035	1.155	.248	

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

			Estimate	S.E.	C.R.	P	Label
ZBI	<---	SI_CUL	.061	.037	1.648	.099	
ZBI	<---	FC1_CUL	.072	.035	2.070	**	
ZBI	<---	AC_CUL	-.083	.047	-1.778	.075	
ZBI	<---	PA_CUL	-.001	.041	-.032	.974	

Note: *** = significance at 99% CL; ** significant at 95% CL; ZBI = Standardized Behavioral intention to use; ZPE = Standardized Performance Expectancy; ZEE = Standardized Effort expectancy; ZPA = Standardized Perceived Autonomy; ZSI = Standardized Social Influence; ZFC1 = Standardized Facilitating Conditions; ZAC = Standardized Absorptive Capacity

The above result for Pakistan indicates that three independent variables, Social Influence (ZSI), Perceived autonomy (ZPA), and Absorptive Capacity (ZAC), has a significant effect on Behavioral intention (ZBI) at 99% confidence levels, since their $\beta = 0.137; 0.146; 0.394$, $p < 0.01$ respectively. Additionally, two independent variables (Facilitating Condition (ZFC1) and Effort Expectancy (ZEE)) and the moderating variables (ZCUL) has a significant effect on behavioral intention (ZBI) at 95% CL since their $\beta = 0.084; 0.085; 0.101$; $p < 0.05$ respectively. However, Performance Expectancy (ZPE) has an insignificant effect on behavioral intention (ZBI).

From the table displaying the moderation effects of culture on the relationship between independent variables and dependent variable (ZBI), the results indicates that two interactions were significant. The interaction between performance expectancy and culture (PE_CUL) had a negative and significant effect on Behavioral intention (ZBI) ($\beta = -0.101$, $p < 0.01$) at 99% CL. This implies that culture is a significant moderator of the effect of performance expectancy on behavioral intention. As well, the interaction between facilitating condition and culture (FC1_CUL) has a significant and positive effect on behavioral intention (ZBI) ($\beta = 0.072$, $p < 0.05$) at 95% CL. This implies that culture is a significant moderator of the effect of facilitating conditions on behavioral intention.

The interaction between the remaining four independent variables and culture (EE_CUL, SI_CUL, AC_CUL, and PA_CUL) has an insignificant effect on the dependent variables (BI) at all levels, both at 95% and 99% confidence levels. This indicates that culture does not moderate any relationship between them and the dependent variable.

4.4 Research result of the comparison between Thailand and Pakistan on behavioral intention to use MOOCs using multi group analysis

Multi-Group SEM Analysis

This section was carried out to address the third objective of the study “To compare the results of Thailand and Pakistan on multigroup analysis on behavioral intention to use MOOCs in Thailand and Pakistan” which was addressed by conducting multi-group SEM analysis.

The section conducted the multi-group SEM analysis to compare the difference in effects of the independent variables on dependent variables between the two countries, Thailand and Pakistan. In this case, the moderating variable “country” was a categorical variable (1 = Thailand, 2 = Pakistan).

The first analysis was testing the whole model to see if the two groups are different (whether there is a difference between Thailand and Pakistan). To do this, the Chi-square differences for the unconstrained and constrained model were compared. After running the model, the results of the default model are presented below.

Table 4.40. Multi-Group SEM Analysis

Paths	Thailand		Pakistan	
	Estimate	P	Estimate	P
EE <--- PA	0.685	***	0.672	***
PE <--- PA	0.658	***	0.684	***
BI <--- PE	0.02	0.492	0.034	0.231
BI <--- EE	0.032	0.247	0.093	**
BI <--- PA	0.249	***	0.205	***
BI <--- SI	0.094	***	0.153	***
BI <--- FC1	0.16	***	0.099	***
BI <--- AC	0.404	***	0.405	***

Note: *** p-value < 0.01; ** p-value < 0.05

From the table above, the insignificant paths for both countries were trimmed (for Thailand BI<---PE; BI<---EE; and for Pakistan BI<---PE) to get the unconstrained model. The Chi-square values for the unconstrained model were recorded. To get the constraint

model, the parameters were named to assume that they were equal for both groups. The difference between Chi-square and degrees of freedom for both groups (Thailand and Pakistan) were calculated and used to evaluate whether the two groups are invariant. The difference between the unconstrained and constraint model and the three thresholds (90%, 95%, and 99% CL) are presented in the table below.

Table 4.41. Constrained and Unconstrained Models

	Chi-square	df	p-value	Invariant?
Overall Model				
Unconstrained	705.845	16		
Fully constrained	711.204	23		
Number of groups		2		
Difference	5.359	7	0.616	YES
Chi-square Thresholds				
90% Confidence	708.55	17		
Difference	2.71	1	0.100	
95% Confidence	709.69	17		
Difference	3.84	1	0.050	
99% Confidence	712.48	17		
Difference	6.63	1	0.010	

From the results presented in the table above, it shows that that the Chi-square difference between the two models was 5.359, and that of degrees of freedom was 7. The p-value was 0.616 ($p > 0.1, 0.05, 0.01$). This indicated that the two groups (Thailand and Pakistan) were invariant. This implied that the models are not different across countries, or rather, the effects of dependent variables on independent variables were invariant (not different) between the two countries. Considering that the overall model was invariant, it did not make sense to do path-by-path analysis for each independent variable.

4.5 Research result of empirical analysis to determine the effects of behavioral intention to use MOOCs in Thailand and Pakistan

The empirical analysis to determine the effects of behavioral intention to use MOOCs in Thailand and Pakistan was guided by the conceptual framework and the resulting study hypotheses, as presented in chapter 3. The results of the analysis is presneted below based on the stated hypotheses.

Hypothesis Testing

Table 4.42. Results of Hypothesis Testing

Hypo thesis	Explanation	Results Country	Decision Beta	
H1	Performance Expectancy (PE) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan	Thailand	-0.048	Reject
		Pakistan	0.022	Reject
H2	Effort Expectancy (EE) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan	Thailand	-0.051	Reject
		Pakistan	0.106	Reject
H3	Social Influence (SI) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan	Thailand	0.155***	Accept
		Pakistan	0.153***	Accept
H4	Facilitating Conditions (FCS) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan	Thailand	0.196***	Accept
		Pakistan	0.117***	Accept
H5	Absorptive Capacity (AC) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan	Thailand	0.478***	Accept
		Pakistan	0.412***	Accept
H6	Perceived Autonomy (PA) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan	Thailand	0.359***	Accept
		Pakistan	0.256***	Accept

Hypothesis	Explanation	Results Country	Decision Beta			
H7	Culture moderates the effect of the independent variables (PE, EE, SI, FCS, AC, & PA) on Behavioral Intention to use MOOCs in Thailand	Thailand	PE	0.000	Reject	
			→			
			BI			
			EE	.006	Reject	
			→			
			BI			
			SI	-.005	Reject	
			→			
			BI			
			FC	.029	Reject	
			S→			
			BI			
			AC	.008	Reject	
			→			
			BI			
			PA	-.046	Reject	
			→			
			BI			
			Pakistan	PE		Accept
				→	-.101***	
		BI				
		EE		Reject		
		→	.040			
		BI				
		SI		Reject		
		→	.061			
		BI				
		FC		Accept		
		S→	.072**			
		BI				
		AC		Reject		
		→	-.083			
		BI				
		PA		Reject		
		→	-.001			
		BI				
H8	There is a difference in the effects of the independent variables (PE, EE,	Unconstrained model X ²	705.845	Reject		

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Hypothesis	Explanation	Results Country	Decision Beta
	SI, FCS, AC, & PA) on BI between the two countries	Fully constrained model X^2 X^2 – difference P-value	711.204 5.359 0.616

Based on the table above, the hypothesis of the study is discussed.

H1: Performance Expectancy (PE) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan

In the case of Thailand, Performance expectancy has an insignificant and negative effect on Behavioral intention ($\beta = -0.048$, $p > 0.05$). For the case of Pakistan performance expectancy has a positive and insignificant effect on behavioral intention to use MOOCs ($\beta = 0.022$, $p > 0.05$). It is observed that for both countries, performance expectancy (perceived usefulness, relative advantage, and outcome expectancy) did not have any significant effect on the behavioral intention of the students to use MOOCs.

H2: Effort Expectancy (EE) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan

For Thailand, effort expectancy has a negative and insignificant effect on behavioral intention to use MOOCs ($\beta = -0.051$, $p > 0.05$). Similarly, for Pakistan, effort expectancy has a positive and insignificant effect on behavioral intention to use MOOCs ($\beta = 0.106$, $p > 0.05$). Comparing these findings, this study observed that in both cases, effort expectancy (perceive effort and ease of use) did not have a significant effect on the students to use MOOCs.

H3: Social Influence (SI) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan

Considering the case of Thailand, social influence has a positive and significant effect on behavioral intention to use MOOCs ($\beta = 0.155$, $p < 0.05$). Similarly, for Pakistan, social influence has a positive and insignificant effect on behavioral intention to use MOOCs (β

= 0.153, $p < 0.05$). Comparing these findings, this study observed that in both cases, an increase in the level of social influence (general social influence and peer social influence) would result in an increase in the behavioral intention of the students to use MOOCs.

H4: Facilitating Conditions (FCS) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan

In Thailand, the results indicated that facilitating conditions had a significant and positive influence on behavioral intention to use MOOCs ($\beta = 0.196$, $p < 0.05$). Similar results were observed for Pakistan. Facilitating conditions had a significant and positive influence on behavioral intention to use MOOCs ($\beta = 0.117$, $p < 0.05$). This implies that an increase in the observed aspects of facilitating condition (perceived behavioral control, facilitating condition) would result in an increase of the behavioral intention to use MOOCs by the students

H5: Absorptive Capacity (AC) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan

Considering the case of Thailand, absorptive capacity has a positive and significant effect on behavioral intention to use MOOCs ($\beta = 0.478$, $p < 0.05$). Similarly, for Pakistan, absorptive capacity has a positive and significant effect on behavioral intention to use MOOCs ($\beta = 0.412$, $p < 0.05$). Comparing these findings, this study observed that in both cases, an increase in the level of absorptive capacity (Knowledge acquisition, Knowledge assimilation, Knowledge transformation) would result in an increase in the behavioral intention of the students to use MOOCs.

H6: Perceived Autonomy (PA) has a positive effect on Behavioral Intention to use MOOCs (BI) in Thailand and Pakistan

In the case of Thailand, it was found that perceived autonomy has a significant and positive effect on behavioral intention to use MOOCs ($\beta = 0.359$, $p < 0.05$). In the case of Pakistan, it was observed that perceived autonomy has a significant and positive effect on behavioral intention to use MOOCs ($\beta = 0.256$, $p < 0.05$). Overall, it is conclusive that an increase/decrease in the perceived autonomy aspects (sense of responsibility, self-

confidence, and freedom) results in an increase/decrease of behavioral intention to use MOOCs by the students.

H7: Culture moderates the effect of the independent variables (PE, EE, SI, FCS, AC, & PA) on behavioral Intention to use MOOCs in Thailand and Pakistan

The moderation effect of culture on the effect of the independent variables (PE, EE, SI, FCS, AC, & PA) on behavioral Intention to use MOOCs in Thailand and Pakistan was evaluated. The results revealed that for Thailand, it was found out that culture does not moderate any relationship between the independent variables and the dependent variables. For Pakistan, culture was found as a significant moderator of the effect of performance expectancy on behavioral intention and the effect of facilitating conditions on behavioral intention to use MOOCs.

H8: There is a difference in the effects of the independent variables (PE, EE, SI, FCS, AC, & PA) on BI between the two countries

The difference between Thailand and Pakistan were compared in terms of the difference in the effects of the independent variables (PE, EE, SI, FCS, AC, & PA) on BI. This was done using a multi-group structural equation modeling. From the results obtained, the two countries were invariant as the Chi-square difference between the two models was 5.359, and that of degrees of freedom was 7. The p-value was 0.616 ($p > 0.1, 0.05, 0.01$). This indicated that the two groups (Thailand and Pakistan) were invariant, or there was no difference in the effects of the independent variables (PE, EE, SI, FCS, AC, & PA) on BI.

CHAPTER 5

CONCLUSIONS AND DISCUSSIONS

5.1 Introduction

This study integrated the perceived autonomy and absorptive capacity to the UTAUT model in the Empirical investigation of the students' intention to use MOOCs in Thailand and Pakistan. The study focused on comparing the findings on both countries and identify the difference in the findings. The study was geared to finding out how the independent variables (performance expectancy, effort expectancy, social influence, facilitating condition, perceived autonomy, and absorptive capacity) influenced the independent variable behavioral intention to use. The study also investigated how the variable culture moderated the relationship between the independent variables and the dependent variable. Further, the study investigated the mediating effect of perceived autonomy on the relationship between performance expectancy and behavioral intention, and effort expectancy and behavioral intention. The study was composed of 20 observed variables and 7 latent variables, and 1 moderating variable. The data was collected from a sample of 1003 respondents from both countries. Various statistical tests were conducted, including descriptive statistics, correlation analysis, reliability and validity analysis of the data, confirmatory factor analysis (CFA), and structural equation modeling (SEM). Based on the findings of the previous chapters, this chapter presents the discussion of the findings, the summary of the findings, implications, and recommendations of the research.

5.2 Discussion of the Findings

The discussion of the findings of this research is organized according to the research questions and research hypothesis, in reference to the previous research findings, to evaluate whether the findings agree or are central to another research conducted previously. A comparison is done for both countries for each research question.

5.2.1 Factors Influencing the Behavioral Intention to use MOOCs

This section addressed objective 1 and 4 by investigates the factors influencing behavioral intention to use MOOCs. The section was discussed in answer to the research question “What are the factors influencing the behavioral intention to use MOOCs in Thailand and Pakistan?” the results were discussed separately for individual countries – Thailand and Pakistan.

5.2.2 The Case for Thailand

Effect of PE on BI

This section discusses the effects of performance expectancy on behavioral intention to use MOOCs. Based on the findings, for the case of Thailand, Performance expectancy has an insignificant and negative effect on Behavioral intention ($\beta = -0.048$, $p > 0.05$). There are previous studies conducted on the same area which had centrally and similar findings. The study conducted by Gupta & Dogra (2017) found out that performance expectancy has a significant influence on traveler’s intention and habit to use technology. As well, a study by San Martín & Herrero (2012) indicated that performance expectancy significantly influenced the intention to make an online purchase.

Effect of EE on BI

This section discusses the effects of effort expectancy on behavioral intention to use MOOCs in Thailand. The findings reveal that effort expectancy has a negative and insignificant effect on behavioral intention to use MOOCs ($\beta = -0.051$, $p > 0.05$). These findings show that effort expectancy (perceive effort and ease of use) did not have a significant effect on the students to use MOOCs. Evacuating the previous research’s, Alkhunaizan & Love (2012) had results centrally that effort expectancy has a significant influence on the behavioral intention to use mobile commerce technology. Wang (2010) also indicated that effort expectancy has a significant effect on behavioral intention to use m-Internet. The contrast of the previous research and current research could be justified by varying study environments.

Effect of SI on BI

The effects of social influence on behavioral intention to use MOOCs for Thailand. It was found that social influence has a positive and significant effect on behavioral intention to use MOOCs ($\beta = 0.155$, $p < 0.05$). This study observed that an increase in the level of social influence (general social influence and peer social influence) would result in an increase in the behavioral intention of the students to use MOOCs. These findings are similar to that of Morosan and DeFranco (2016), whose study indicated that social influences have a significant effect on NFC- Mobile purchase in hotels. However, on the central, Jeng & Tzeng (2012) social influence does not have a significant influence on the behavioral intention to use a clinical decision support system (CDSS) for medical professionals.

Effect of FC on BI

The effects of facilitating condition on behavioral intention to use MOOCs for Thailand. The results indicated that facilitating conditions had a significant and positive influence on behavioral intention to use MOOCs ($\beta = 0.196$, $p < 0.05$). This implies that an increase in the observed aspects of facilitating condition (perceived behavioral control, facilitating condition) would result in an increase of the behavioral intention to use MOOCs by the students. These findings are in agreement with that of Sam & Baharin (2018), who indicated that facilitating conditions significantly and positively affect the users' behavioral intention to use the online booking system. Similarly, Almatari, Iahad & Balaid (2013) found that facilitating conditions has a positive and significant effect on student's intention to use mobile learning.

Effect of PA on BI

This section discusses the relationship between perceived autonomy and the behavioral intention to use MOOCs. In the case of Thailand, it was found that perceived autonomy has a significant and positive effect on behavioral intention to use MOOCs ($\beta = 0.359$, $p < 0.05$). It is conclusive that an increase/decrease in the perceived autonomy aspects (sense of responsibility, self-confidence, and freedom) results in an increase/decrease of behavioral intention to use MOOCs by the students. These findings are supported by literature, such as the study by Lakhali, Khechine, & Pascot (2013);

Sierens, Vansteenkiste, Goossens, Soenens & Dochy (2009), whose study found that there is a positive relationship between perceived autonomy and behavioral intention to undertake the self-regulated learning. Similarly, Jang, Reeve & Deci (2010) indicated that students' online study engagement was influenced by autonomy support and structure, while both autonomy support and structure have a significant effect on the students' behavioral engagement.

Effect of AC on BI

The effects of absorptive capacity on behavioral intention to use MOOCs are discussed in this section. Absorptive capacity has a positive and significant effect on behavioral intention to use MOOCs ($\beta = 0.478, p < 0.05$). This study observed that an increase in the level of absorptive capacity (Knowledge acquisition, Knowledge assimilation, Knowledge transformation) would result in an increase in the behavioral intention of the students to use MOOCs. These findings are in line with that of Scuotto, Del Giudice & Carayannis (2017), who indicated that absorptive capacity has a significant influence on the behavioral intention to use SME innovations. Similarly, Mayeh, Ramayah & Popa (2014) found out that absorptive capacities had a significant influence on the intention to use ERP systems.

5.2.3 The Case for Pakistan

Effect of PE on BI

This section discusses the effects of performance expectancy on behavioral intention to use MOOCs in Pakistan. The results showed that performance expectancy has a positive and insignificant effect on behavioral intention to use MOOCs ($\beta = 0.022, p > 0.05$). It is observed that for both countries, performance expectancy (perceived usefulness, relative advantage, and outcome expectancy) did not have any significant effect on behavioral intention of the students to use MOOCs. There are previous studies conducted on the same area which had centrally and similar findings. The study conducted by Gupta & Dogra (2017) found out that performance expectancy has a significant influence on traveler's intention and habit to use technology. As well, a study by San Martín & Herrero (2012) indicated that performance expectancy significantly influenced the intention to make an online purchase.

Effect of EE on BI

This section discusses the effects of effort expectancy on behavioral intention to use MOOCs in Pakistan. The results showed that effort expectancy has a positive and insignificant effect on behavioral intention to use MOOCs ($\beta = 0.106, p > 0.05$). These findings show that effort expectancy (perceive effort and ease of use) did not have a significant effect on the students to use MOOCs. Evacuating the previous research's, Alkhunaizan & Love (2012) had results centrally that effort expectancy has a significant influence on the behavioral intention to use mobile commerce technology. Wang (2010) also indicated that effort expectancy has a significant effect on behavioral intention to use m-Internet. The contrast of the previous research and current research could be justified by varying study environments.

Effect of SI on BI

The effects of social influence on behavioral intention to use MOOCs for Pakistan. It was found that social influence has a positive and insignificant effect on behavioral intention to use MOOCs ($\beta = 0.153, p < 0.05$). This study observed that an increase in the level of social influence (general social influence and peer social influence) would result in an increase in the behavioral intention of the students to use MOOCs. These findings are similar to that of Morosan and DeFranco (2016), whose study indicated that social influences have a significant effect on NFC- Mobile purchase in hotels. However, on the central, Jeng & Tzeng (2012), social influence does not have a significant influence on the behavioral intention to use a clinical decision support system (CDSS) for medical professionals.

Effect of FC on BI

The effects of facilitating condition on behavioral intention to use MOOCs for Pakistan. The results showed that facilitating conditions had a significant and positive influence on behavioral intention to use MOOCs ($\beta = 0.117, p < 0.05$). This implies that an increase in the observed aspects of facilitating condition (perceived behavioral control, facilitating condition) would result in an increase of the behavioral intention to use MOOCs by the students. These findings are in agreement with that of Sam & Baharin (2018), who indicated that facilitating condition significantly and positively affect the users' behavioral

intention to use the online booking system. Similarly, Almatari, Iahad & Balaid (2013) found that facilitating condition has a positive and significant effect on student's intention to use mobile learning.

Effect of PA on BI

This section discusses the relationship between perceived autonomy and the behavioral intention to use MOOCs. It was observed that perceived autonomy has a significant and positive effect on behavioral intention to use MOOCs ($\beta = 0.256, p < 0.05$). It is conclusive that an increase/decrease in the perceived autonomy aspects (sense of responsibility, self-confidence, and freedom) results in an increase/decrease of behavioral intention to use MOOCs by the students. These findings are supported by literature, such as the study by Lakhali, Khechine, & Pascot (2013); Sierens, Vansteenkiste, Goossens, Soenens & Dochy (2009), whose study found that there is a positive relationship between perceived autonomy and behavioral intention to undertake the self-regulated learning. Similarly, Jang, Reeve & Deci (2010) indicated that students' online study engagement was influenced by autonomy support and structure, while both the autonomy support and structure have a significant effect on the students' behavioral engagement.

Effect of AC on BI

The effects of absorptive capacity on behavioral intention to use MOOCs are discussed in this section. The absorptive capacity has a positive and significant effect on behavioral intention to use MOOCs ($\beta = 0.412, p < 0.05$). This study observed that an increase in the level of absorptive capacity (Knowledge acquisition, Knowledge assimilation, Knowledge transformation) would result in an increase in the behavioral intention of the students to use MOOCs. These findings are in line with that of Scuotto, Del Giudice & Carayannis (2017), who indicated that absorptive capacity has a significant influence on the behavioral intention to use SME innovations. Similarly, Mayeh, Ramayah & Popa (2014) found out that absorptive capacities had a significant influence on the intention to use ERP systems.

Mediating Effects of PE and EE on Effect of PA on BI to use

In this study, performance expectancy (perceived usefulness, relative advantage, and outcome expectations) effort expectancy (perceived ease of use and ease of use) was

used as mediators of the relationship between perceived autonomy (Sense of responsibility, Self-confidence, and Freedom) and behavioral intention to use MOOCs. The mediating effects for the two variables were done separately for Thailand and Pakistan and were presented as indirect effects in Tables 4.13 and 4.14 in chapter 4. In the case of Thailand, effort expectancy was found to have an insignificant mediation effect on the relationship between perceived autonomy and behavioral intention to use MOOCs ($\beta = -0.042$, $p > 0.05$). Similarly, performance expectancy was found to have an insignificant mediation effect on the relationship between perceived autonomy and behavioral intention to use MOOCs ($\beta = -0.034$, $p > 0.05$). Considering the case of Pakistan, effort expectancy was found to have an insignificant mediation effect on the relationship between perceived autonomy and behavioral intention to use MOOCs ($\beta = 0.084$, $p > 0.05$). Similarly, performance expectancy was found to have an insignificant mediation effect on the relationship between perceived autonomy and behavioral intention to use MOOCs ($\beta = 0.018$, $p > 0.05$). Overall, performance expectancy and effort expectancy did not mediate the relationship between performance autonomy and behavioral intention to use MOOCs by the students.

5.2.5 Moderating Effect of Culture

This section addressed objective 2 by investigated the moderation effect of culture on the factors influencing behavioral intention to use MOOCs. The results are discussed in response to the research objective “To empirically determine the moderation effect of culture on behavioral intention to use MOOCs in Thailand and Pakistan”. The results are discussed below.

Moderating effect of Culture on Effect of PE on BI

This section evaluated the moderating effect of culture on the relationship between performance expectancy and behavioral intention to use MOOCs. For the case of Thailand, culture did not have a moderating effect on the relationship between performance expectancy and behavioral intention to use MOOCs (the interaction effect of performance expectancy and culture on behavioral intention to use had ($\beta = 0.000$, $p > 0.05$). However, a central observation was made in Pakistan that culture had a significant moderating effect on the relationship between performance expectancy and behavioral intention to use

MOOCs. This is because the interaction effect of performance expectancy and culture on behavioral intention to use was $\beta = -0.101, p < 0.05$).

Moderating effect of Culture on Effect of EE on BI

This section investigated whether the effect of EE on BI was moderated by culture. For the case of Thailand, the results indicated that culture did not significantly moderate the relationship between effort expectancy and behavioral intention to use (the interaction effect of effort expectancy and culture had $(\beta = 0.006, p > 0.05)$). Similar results of no moderation effect of culture were observed for the case of Pakistan where the interaction between culture and effort expectancy on behavioral intention to use was $(\beta = 0.040, p > 0.05)$.

Moderating effect of Culture on Effect of SI on BI

The results indicated that for Thailand, the results indicated that culture did not significantly moderate the relationship between social influence and behavioral intention to use MOOC. The interaction effect of social influence and culture shows that $\beta = -0.005, p > 0.05$). Similar results of no moderation effect of culture were observed for the case of Pakistan, where the interaction between culture and social influence on behavioral intention to use MOOCs was $(\beta = 0.061, p > 0.05)$.

Moderating Effect of Culture on Effect of FC on BI

An analysis of the moderation effect of the relationship between facilitating condition and behavioral intention to use indicated that for Thailand, culture does not have a significant moderation effect of the effect of facilitating condition on behavioral intention to use MOOCs. The interaction effect of facilitating conditions and culture shows that $\beta = .029, p > 0.05$); however, in the case of Pakistan, culture was found to significantly moderate the relationship between facilitating condition and behavioral intention to use MOOCs was .072.

Moderating Effect of Culture on Effect of PA on BI

Considering the moderation effect of culture between the two variables (PA and BI), Thailand results indicated that culture did not significantly moderate the relationship between perceived autonomy and behavioral intention to use MOOC. The interaction effect of perceived autonomy and culture shows that $\beta = -0.046, p > 0.05$). Similar results of no

moderation effect of culture were observed for the case of Pakistan where the interaction between culture and perceived autonomy on behavioral intention to use MOOCs was ($\beta = -0.001, p > 0.05$).

Moderating Effect of Culture on Effect of AC on BI

The moderating effect of culture on this relationship was evaluated separately for Thailand and Pakistan. For Thailand, the results indicated that culture did not significantly moderate the relationship between absorptive capacity and behavioral intention to use MOOC. The interaction effect of absorptive capacity and culture shows that $\beta = -0.008, p > 0.05$). Similar results of no moderation effect of culture were observed for the case of Pakistan where the interaction between culture and absorptive capacity on behavioral intention to use MOOCs was ($\beta = -0.083, p > 0.05$).

5.2.6 Comparison of Thailand and Pakistan

This section is discussed in reference to objective 3 and the research question “What is the difference between Thailand and Pakistan in terms of factors influencing the behavioral intention to use MOOCs?” To compare whether there was a significant difference between Thailand and Pakistan results, a multi-group structural equation modeling was conducted. The two countries were invariant from the results obtained as the Chi-square difference between the two models was 5.359, and that of degrees of freedom was 7. The p-value was 0.616 ($p > 0.1, 0.05, 0.01$). This indicated that the two groups (Thailand and Pakistan) were invariant. It implied that as far as various variables used in this study are concerned, the students in Thailand and Pakistan have more or less the same responses. These findings could be affirmed by the fact that in the general SEM model, similar independent variables (perceived autonomy, social influence, facilitating conditions, and absorptive capacity) were found to significantly influence behavioral intention to use MOOCs, for both Thailand and Pakistan.

5.3 Conclusions

The purpose of this research is to empirically investigate students' behavioral intention to use MOOCs in Thailand and Pakistan, with the integration of the perceived

autonomy and absorptive capacity to the UTAUT model applied in the analysis. From the results and the discussion presented in the previous section, the conclusions of the findings of this research are presented in this section. First, the study concluded that the model applied in this study satisfied all the requirements, including the reliability, validity, and model fitness thresholds, which implies that the results presented can be trusted. Secondly, this study focused on investigating the effects of various observed variables on behavioral intention to use MOOCs in Thailand and Pakistan. The study concluded that four variables (social influence, absorptive capacity, facilitating conditions, and perceived autonomy) significantly influence the students' intention to use MOOCs in Thailand and Pakistan. However, two variables (performance expectancy and effort expectancy) do not influence students' intention to use MOOCs in Thailand and Pakistan. The study also concluded that effort expectancy and performance expectancy do not mediate the relationship between perceived autonomy and behavioral intention to use MOOCs in Thailand and Pakistan. An investigation of the moderating effect of culture was carried out in this study. From the findings, it is conclusive that culture has varied results for Thailand and Pakistan. For Thailand, culture did not moderate any relationship between endogenous and exogenous variables. However, for Pakistan, culture significantly moderated the relationship between performance expectancy and students' behavioral intention to use MOOCs; and the relationship between facilitating condition and students' behavioral intention to use MOOCs. Therefore, the aspect of culture is more important in Pakistan as compared to Thailand. Data used in this study were collected from two countries, Thailand and Pakistan universities, using a similar questionnaire. Therefore, it was important to investigate the variance of the responses and the results of the two countries. A multi-group structural equation was applied to find out the variance in the effects of independent variables on dependent variables between the two countries. Applying the Chi-square technique, the results indicated that the findings between the two countries were invariant. It was therefore conclusive that the students' intention to use MOOCs as observed from the perspective of the influence from independent variables was the same for both Thailand and Pakistan.

5.4 Implications

The results obtained from this study make an important contribution towards extending the theoretical and empirical knowledge as far as the use of MOOCs by the students is concerned. It also provides other suggestions for developing and improving the application of the concepts through managerial implications. These implications are discussed in this section.

5.4.1 Practical Implications

MOOCs, a disruptive educational trend, particularly in the higher education sector, have been there for several decades. However, its importance and prominence were not clearly depicted until the year 2020, in the wake of the Covid-19 pandemic. Social distancing and lock-down were among the measures adopted by nations to prevent the spread of the deadly virus. As a result, many institutions of higher learning opted to deliver their learning activities online, a form of MOOCs. However, there has not been clear what are the factors that influence the students' intention to use MOOCs. Therefore, practically, this study has highlighted the significant factors worth evaluating, as far as adoption and implementation of MOOCs by institutions of higher learning is concerned. First, the institution of higher learning could use the finding of this research to determine how the students respond to the use of MOOCs, in terms of the aspects of various aspects included in this study. For instance, how the aspects of social influence (general social influence and peer social influence), which was a significant exogenous variable, affect the intention to use MOOCs. Secondly, during the period of the Covid-19 pandemic, this study could prove very beneficial in determining the factors that the officials of higher institutions of learning should consider when implementing MOOCs and associated online learning programs to deliver quality education programs to the students. Thirdly, this study included the variable of absorptive capacity in the model to evaluate how the variable influence the behavioral intention to use MOOCs, which turned to be a significant determinant of the behavioral intention of students to use MOOCs. The aspects of knowledge acquisition the universities and other institutions should consider include knowledge acquisition, knowledge assimilation, and knowledge transformation. For instance, assessing whether “students are

able to learn through interactive discussion forum using MOOCs?”, “are students able to share important knowledge using MOOCs?” or “are the students able to assimilate research and education-related issues using MOOCs?” These are some of the vital questions regarding knowledge acquisition as far as the use of MOOCs is concerned.

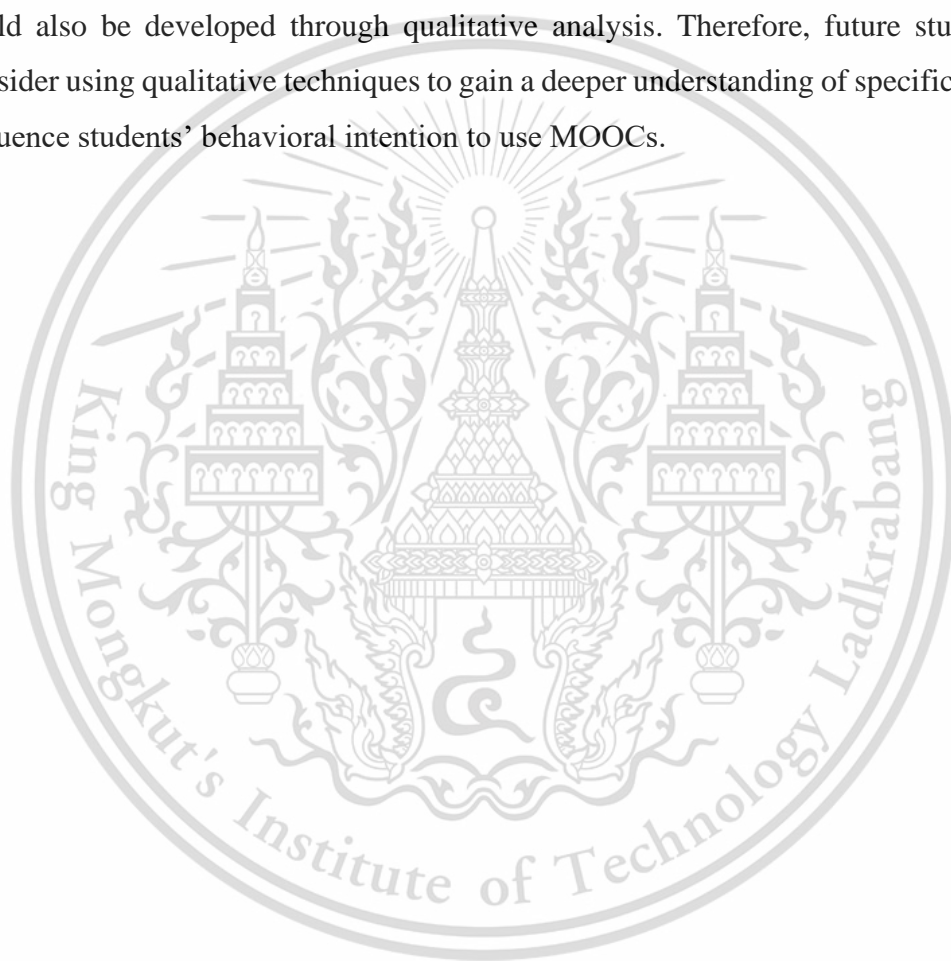
5.4.2 Theoretical Implications

Theoretically, this research applied a model which investigated the factors affecting students’ behavioral intention to use MOOCs. The model was developed in reference to the Unified Theory of Acceptance and Use of Technology (UTAUT) model, as Venkatesh et al. (2003) developed. According to the UTAUT model, four major constructs determine the behavioral intention and the ultimate behavior of technological system adoption and use. These constructs include performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., (2003). The model of this research extended this theoretical foundation by including two additional variables, Perceived autonomy and Absorptive capacity. According to Yang (2014), perceived autonomy implies the degree to which an individual experiences or exercises the freedom of choice in terms of ability to lead a self-determined life. Cohen and Levinthal (1990) indicated that Absorptive capacity implies the ability to locate and apply new ideas, technology, and innovation and incorporate them within the organization process. The inclusion of these constructs in the theoretical model proposed by Venkatesh et al. (2003) has proved vital as there are no results indicating that they significantly influence the behavioral intention of the students to use MOOCs.

5.5 Limitations and Recommendations

The limitations and recommendations of this research are discussed in this section. First, this study was carried out in Thailand and Pakistan universities only. Therefore, the application of the findings of this study should consider this context. However, there are other institutions of higher education institutions that could also be considered for such as study in the future. In the development of the theoretical model of this research, the study entirely referenced from the UTAUT model and extended it by including two additional variables, perceived autonomy, and absorptive capacity. Though the UTAUT model was

developed by the integration of eight other different models such as TAM, IDT, TRA, the motivational model, TPB, a model was combining the TAM and TPB, the model of PC utilization and social SCT. This study recommended that future studies consider including other theoretical frameworks, such as the UTAUT2 model, which incorporates hedonic motivation, price value, and habit. Thirdly, this study adopted the quantitative technique, and the data were analyzed statistically. Therefore, the findings of this study are entirely based on the statistical analysis of the data collected. However, some important insights could also be developed through qualitative analysis. Therefore, future studies should consider using qualitative techniques to gain a deeper understanding of specific factors that influence students' behavioral intention to use MOOCs.



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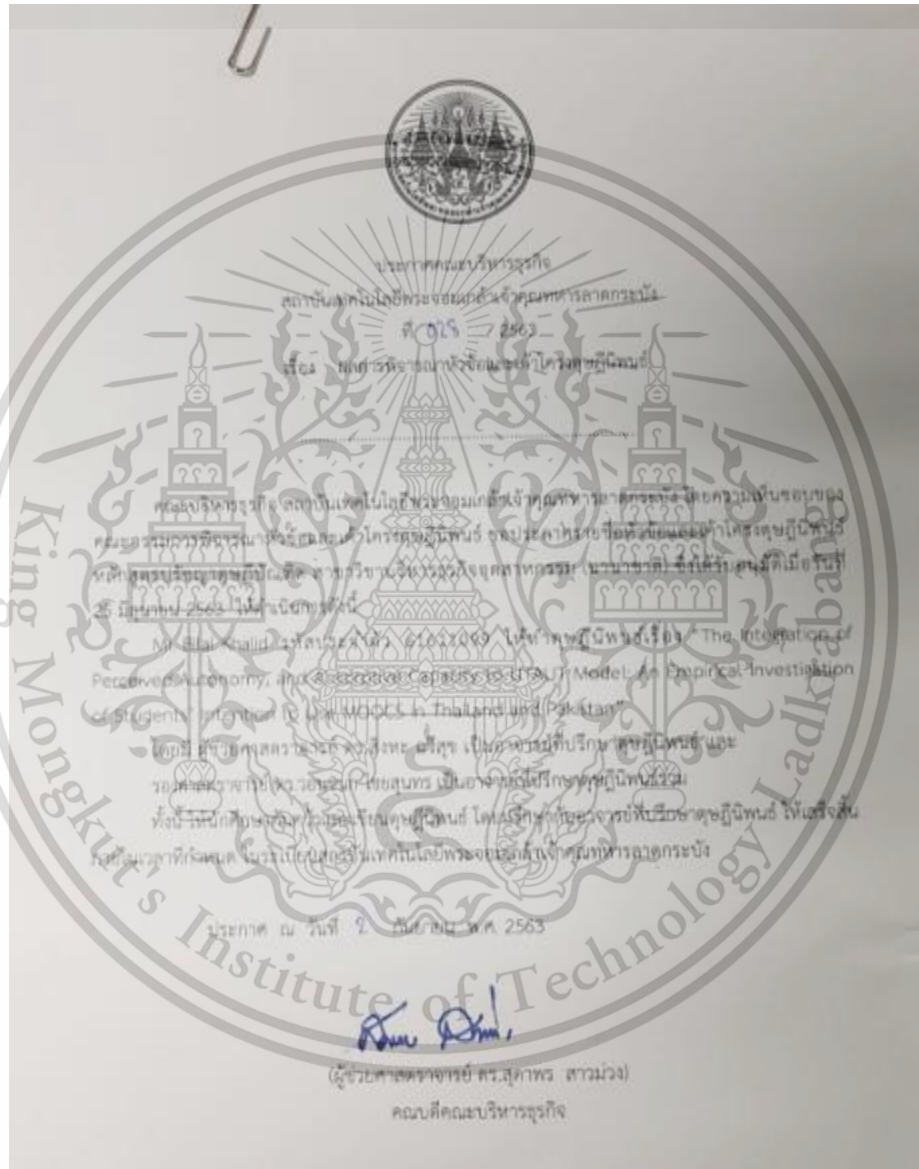
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เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

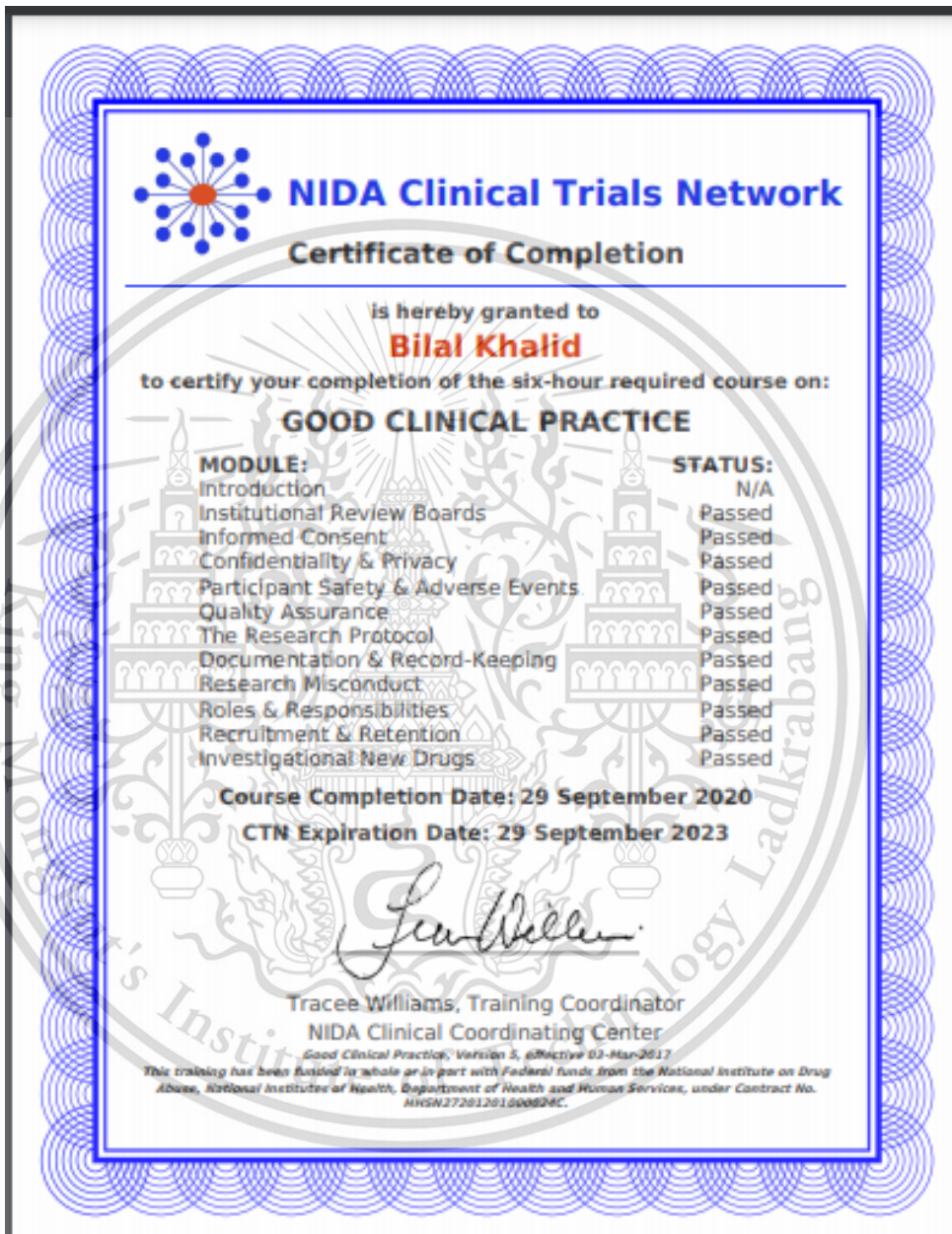
APPENDIX A

THESIS APPROVAL LETTER



เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

ETHICAL TRAINING CERTIFICATE



เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

APPENDIX B

RESEARCH INSTRUMENTS

Affidavit of Translation Accuracy

This is to testify that the translated version of the questionnaire used in this research study is a verbatim, true, and faithful translation for all the established questions in the questionnaire are in its complete compliance, rationale, contextual, and in its whole spirit.

Asst. Prof. Dr. Singha Chaveesuk

Assoc. Prof. Dr. Wornchanok Chaiyasoonthorn

Questionnaire

This questionnaire is a part of the research of the Doctor of Philosophy Program in Industrial Business Administration (International Program), Faculty of KMITL Business School, at KMITL University. The data collected from this questionnaire will be treated with the utmost confidentiality. Kindly answer to the best of your knowledge.

The questionnaire designed for this study will be divided into 6 parts:

Part 1: Questions on the demographic data

Part 2: Questions about the computer knowledge and internet experience

Part 3: Questions about the latent and observed variables of the UTAUT model from MOOCs perspective

Part 4: Questions about the absorptive capacity of respondents

Part 5: Questions about perceived autonomy of respondents

Part 6: Questions about uncertainty avoidance and individualism/collectivism dimension of culture from MOOCs perspective

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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Part 1: Demographic Data of the Respondents

ส่วนที่ 1: ข้อมูลประชากรของผู้ตอบแบบสอบถาม

Tick (✓) the option applicable for each of the questions listed below.

ทำเครื่องหมาย (✓) ตัวเลือกสำหรับคำถามแต่ละข้อที่ระบุไว้ด้านล่าง

1) Gender: เพศ:

Male ชาย Female หญิง Others, Please Specify __ อื่น ๆ โปรดระบุ __

2) Age อายุ

Under 20 years ต่ำกว่า 20 ปี 21-30 years ปี 31-40 years ปี

41-50 years ปี 51-60 years ปี Older than 60 years มีอายุมากกว่า 60 ปี

3) Highest Education Level ระดับการศึกษาสูงสุด

Under a Bachelor Degree ต่ำกว่าปริญญาตรี Bachelor's Degree ปริญญาตรี

Higher than Bachelor Degree สูงกว่าปริญญาตรี

4) Occupation อาชีพ

Self-employed ประกอบอาชีพอิสระ Company employee พนักงาน บริษัท

Government officer ข้าราชการ student นักเรียน

Unemployedว่างงาน Others (specify) ... อื่น ๆ (ระบุ)

5) Location of current residence ที่ตั้งของที่อยู่อาศัยปัจจุบัน

Thailand ประเทศไทย Pakistan ปากีสถาน

6) University Affiliation in Thailand สังกัดมหาวิทยาลัยในประเทศไทย

Chiang Mai University มหาวิทยาลัยเชียงใหม่

Mae Fah Luang University มหาวิทยาลัยแม่ฟ้าหลวง

Khon Kaen University มหาวิทยาลัยขอนแก่น

Mahidol University มหาวิทยาลัยมหิดล

Chulalongkorn University จุฬาลงกรณ์มหาวิทยาลัย

Kasetsart University มหาวิทยาลัยเกษตรศาสตร์

Thammasat University มหาวิทยาลัยธรรมศาสตร์

Prince Songkhla University มหาวิทยาลัยสงขลานครินทร์

King Mongkut's Institute of Technology Thonburi (KMUTT)

สถาบันเทคโนโลยีพระจอมเกล้าธนบุรี (KMUTT)

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ตัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

- () King Mongkut's Institute of Technology Ladkrabang (KMITL)
สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง (KMITL)
- 7) University Affiliation in Pakistan สังกัดมหาวิทยาลัยในปากีสถาน
- () Ghulam Ishaq Khan Institute of Engineering Science and Technology
() Lahore University of Management and Science
() Institute of Business Administration
() Institute of Business Management
() Greenwich University
() Iqra University
() SZABIST
() University of Baluchistan
() COMSATS University
() Virtual University of Pakistan

Part 2: Questions about Computer Knowledge and Internet Experience of the Respondents

ส่วนที่ 2: คำถามเกี่ยวกับความรู้เกี่ยวกับคอมพิวเตอร์และประสบการณ์อินเทอร์เน็ตของผู้ตอบ

Tick (✓) the option applicable for each of the questions listed below.

ทำเครื่องหมาย (✓) ตัวเลือกสำหรับคำถามแต่ละข้อที่ระบุไว้ด้านล่าง

- 8) How do you describe your general computer knowledge? **คุณบอกระดับความรู้ทั่วไปเกี่ยวกับคอมพิวเตอร์ของคุณอย่างไร?**
- () Very poor () Poor () Moderate () Good () Very Good
() แย่มาก () แย่ () ปานกลาง () ดี () ดีมาก
- 9) How would you describe your internet knowledge? **คุณบอกระดับความรู้เกี่ยวกับอินเทอร์เน็ตของคุณอย่างไร?**
- () Very poor () Poor () Moderate () Good () Very Good
() แย่มาก () แย่ () ปานกลาง () ดี () ดีมาก
- 10) How long have you been using the Internet? **คุณใช้อินเทอร์เน็ตมานานแค่ไหน?**

() Don't use () Less than 1 year () 1 – 3 years

() ห้ามใช้ () น้อยกว่า 1 ปี () 1-3 ปี

11) How often do you use the Internet per day? **คุณใช้อินเทอร์เน็ตบ่อยแค่ไหนต่อวัน?**

() Less than 1 hour () 1-2 Hours () 2-3 Hours

() น้อยกว่า 1 ชั่วโมง () 1-2 ชั่วโมง () 2-3 ชั่วโมง

Part 3: Questions on Latent and Observed Variables of the UTAUT model of the Respondents from MOOCs perspective

ส่วนที่ 3: คำถามเกี่ยวกับตัวแปรแฝงและการสังเกตของแบบจำลอง UTAUT ของผู้ตอบแบบสอบถามจากมุมมองของ MOOCs

Performance Expectancy ความคาดหวังประสิทธิภาพ	1	2	3	4	5
<u>Perceived Usefulness รับรู้ประโยชน์</u> 1) Using MOOCs enables me to accomplish my learning activities more quickly ฉันคาดว่า การใช้ MOOCs จะช่วยให้ฉันทำกิจกรรมเพื่อการเรียนรู้ได้รวดเร็วมากยิ่งขึ้น					
2) Using MOOCs improves my learning performance (i.e., Develop New Skills, Techniques and Gain Experience) ฉันคาดว่า การใช้ MOOCs จะช่วยเพิ่มประสิทธิภาพการเรียนรู้ของฉัน เช่น ฉันได้พัฒนาทักษะใหม่ๆ เทคนิคการใช้งาน และได้รับประสบการณ์					

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า ไม่ว่าจะกรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Performance Expectancy ความคาดหวังประสิทธิภาพ	1	2	3	4	5
3) Using MOOCs increases productivity in my learning activities (i.e., able to learn and understand a large amount of information) ฉันคาดว่า การใช้ MOOCs จะช่วยเพิ่มประสิทธิภาพในการทำกิจกรรมการเรียนรู้ของฉัน เช่น การจัดการเรียนรู้โดยใช้ปัญหาเป็นฐาน					
4) Using MOOCs enhances effectiveness in my learning activities (i.e., Gain comprehensive knowledge and greater understanding about course being studied for improving grades and academic performance) ฉันคาดว่า การใช้ MOOCs จะช่วยเพิ่มประสิทธิผลในการเรียนรู้ของฉันได้ ทำให้เรียนรู้ได้มากขึ้น เข้าใจเรื่องที่ซับซ้อนได้มากขึ้น					
5) Using MOOCs would make it easier to complete my courses and modules faster ฉันคาดว่า การใช้ MOOCs จะช่วยให้เรียนจบหลักสูตรและการเรียนแบบโมดูลได้เร็วขึ้น					
6) I would find MOOCs useful in my learning activities ฉันคาดว่า MOOCs มีประโยชน์ในกิจกรรมการเรียนรู้ของฉัน					
Relative Advantage ความได้เปรียบสัมพัทธ์ 7) Using MOOCs enables me to learn more quickly as compared to traditional classroom ฉันคาดว่า การใช้ MOOCs จะช่วยให้ฉันเรียนรู้ได้เร็วขึ้นเมื่อเทียบกับการเรียนห้องเรียนแบบเดิม					

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Performance Expectancy ความคาดหวังประสิทธิภาพ	1	2	3	4	5
8) Using MOOCs improves the quality of my learning activities (i.e., To achieve better grades and improve academic performance). ฉันคาดว่า การใช้ MOOCs ช่วยเพิ่มคุณภาพของกิจกรรมการเรียนรู้ของฉัน เช่น .ช่วยให้ได้เกรดและผลการเรียนที่ดีขึ้น					
<u>Outcome Expectation</u> ความคาดหวังผลลัพธ์					
9) If I use MOOCs, I will increase the chances of getting higher marks on tests and exams for the same amount of effort ฉันคาดว่า ถ้าฉันใช้ MOOCs จะเพิ่มโอกาสให้ได้คะแนนสูงขึ้นเมื่อใช้ความพยายามเท่ากัน					
10) If I use MOOCs, my classmates will perceive me as competent ฉันคาดว่า ถ้าฉันใช้ MOOCs เพื่อนร่วมชั้นจะรับรู้ได้ว่าฉันมีความสามารถ					
11) If I use MOOCs, I will increase my chances of advancing to the next level ฉันคาดว่า ถ้าฉันใช้ MOOCs ฉันจะเพิ่มโอกาสในการก้าวไปสู่ระดับถัดไป เช่น การได้เลื่อนชั้น					
Effort Expectancy ความพยายามความคาดหวัง					
<u>Perceived Ease of Use</u> ใช้งานง่าย					
12) Learning to operate MOOCs would be easy for me ฉันคาดว่า การเรียนรู้การใช้งาน MOOCs จะเป็นเรื่องง่ายสำหรับฉัน					
13) My interaction with MOOCs would be clear and understandable ฉันคาดว่า ฉันสามารถทำงานร่วมกับ MOOCs ได้เป็นอย่างดี					

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Performance Expectancy ความคาดหวังประสิทธิภาพ	1	2	3	4	5
14) I find MOOCs to be flexible to interact with ฉันคิดว่า MOOCs มีความยืดหยุ่นในการโต้ตอบ ปรับเปลี่ยนได้ง่าย					
15) It is easy for me to become skillful at using MOOCs ฉันคิดว่า มันจะเป็นเรื่องง่ายสำหรับฉันที่จะเชี่ยวชาญในการใช้ MOOCs					
<u>Ease of Use</u> สะดวกในการใช้					
16) I believe I require little effort to understand how MOOCs works ฉันเชื่อว่า ในการทำงานของ MOOCs ทำให้ฉันเข้าใจได้โดยไม่ต้องใช้ความพยายามมาก					
17) Overall, I believe that MOOCs is easy to use โดยรวมแล้วฉันเชื่อว่า MOOCs สะดวกในการใช้งาน					
Social Influence อิทธิพลทางสังคม					
<u>General Social Influence</u> อิทธิพลทางสังคมทั่วไป					
18) People who influence my behavior think that I should use MOOCs คนที่มีอิทธิพลต่อฉัน เช่น ผู้ปกครอง คิดว่าฉันควรใช้ MOOCs					
19) People who are important to me think I should use MOOCs คนที่สำคัญของฉัน เช่น คุณครู คิดว่าฉันควรใช้ MOOCs					
20) My learning institution supports the use of MOOCs สถานศึกษาของฉันสนับสนุนการใช้ MOOCs					
<u>Peer Social Influence</u> อิทธิพลทางสังคมของเพื่อน					
21) Learner's who use MOOCs enjoy more prestige than those who do not ผู้เรียนที่ใช้ MOOCs จะได้รับการยกย่องมากกว่าผู้ที่ไม่ได้ใช้					

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า ไม่ว่าจะกรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Performance Expectancy ความคาดหวังประสิทธิภาพ	1	2	3	4	5
22) Learner's who use MOOCs have a high profile ผู้เรียนที่ใช้ MOOCs มักมีโปรไฟล์ที่โดดเด่น					
23) My peers and teachers think that I should use MOOCs เพื่อนของฉันคิดว่าฉันควรใช้ MOOCs					
Facilitating Conditions เงื่อนไขการอำนวยความสะดวก					
Perceived Behavioral Control การควบคุมพฤติกรรมการเรียนรู้					
24) I have necessary resources to use MOOCs ฉันมีทรัพยากรที่จำเป็นในการใช้ MOOCs เช่น เครื่องคอมพิวเตอร์ อินเทอร์เน็ต					
25) I have necessary knowledge to use MOOCs ฉันมีความรู้ที่จำเป็นในการใช้ MOOCs เช่น ความรู้ในการคอมพิวเตอร์และอินเทอร์เน็ต					
Facilitating Conditions เงื่อนไขการอำนวยความสะดวก					
26) Guidance is available to me in the selection of MOOCs ระบบมีคำแนะนำในการเลือกใช้ MOOCs ให้แก่ฉัน					
27) Specialized instructions concerning the MOOCs was available to me ระบบมีคำแนะนำเฉพาะทางเกี่ยวกับการใช้ MOOCs เช่น วิธีการติดตั้ง ให้แก่ฉัน					
28) I get the support from a specific person/group when I face difficulties with MOOCs ฉันได้รับการสนับสนุนจากบุคคล / กลุ่มเฉพาะเมื่อประสบปัญหาในการใช้ MOOCs					
29) Using MOOCs fits my learning style การใช้ MOOCs เหมาะกับสไตล์การเรียนรู้ของฉัน					

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Performance Expectancy ความคาดหวังประสิทธิภาพ	1	2	3	4	5
Behavioral Intention to Use ความตั้งใจในการใช้พฤติกรรม					
Intention ความตั้งใจ					
30) I intend to use MOOCs immediately ฉันตั้งใจจะใช้ MOOCs ในทันที					
31) I intend to use MOOCs in future learning sessions ฉันตั้งใจจะใช้ MOOCs เพื่อการเรียนรู้ในอนาคต					
32) I intend to utilize MOOCs for various purposes such as self-development as well as earning credit hours ฉันตั้งใจที่จะใช้ MOOCs เพื่อวัตถุประสงค์ต่างๆ เช่น การพัฒนาตนเอง การเก็บสะสมหน่วยกิตเพื่อเรียนต่อในอนาคตได้					
33) If MOOCs become more diverse in the future, I intent to use it frequently after graduation หากในอนาคต MOOCs มีความหลากหลายมากขึ้น ฉันตั้งใจจะใช้บ่อยครั้งหลังจากสำเร็จการศึกษา					
Prediction คาดการณ์					
34) I predict I will use MOOCs immediately ฉันคาดการณ์ว่าฉันจะใช้ MOOCs ในทันที					
35) I predict I would use MOOCs in future learning sessions ฉันคาดการณ์ว่าฉันจะใช้ MOOC เพื่อการเรียนรู้ในอนาคต					
36) I predict I will utilize MOOCs for various purposes such as self-development as well as earning credit hours ฉันคาดการณ์ที่จะนำ MOOCs ไปใช้สำหรับหลากหลายวัตถุประสงค์ เช่น การพัฒนาตนเอง รวมถึงการได้รับจำนวนหน่วยกิตการเรียน					

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Performance Expectancy ความคาดหวังประสิทธิภาพ	1	2	3	4	5
37) If MOOCs become more diverse in the future, I predict I will use them frequently after graduation ถ้าMOOCsมีความหลากหลายมากยิ่งขึ้นในอนาคตฉันคาดการณ์ว่าจะใช้มันบ่อยมากขึ้นหลังจากสำเร็จการศึกษา					
Planning การวางแผน					
38) I plan to use MOOCs immediately ฉันวางแผนที่จะใช้ MOOCs เพื่อการเรียนรู้ในอนาคต					
39) I plan to use MOOCs in future learning sessions. ฉันวางแผนที่จะใช้ MOOCs ในทันที					
40) I plan to utilize MOOCs for various purposes such as self-development as well as earning credit hours ฉันวางแผนที่จะนำ MOOCs ไปใช้สำหรับหลากหลายวัตถุประสงค์ เช่น การพัฒนาตนเอง รวมถึงการได้รับจำนวนหน่วยกิตการเรียน					
41) If MOOCs become more diverse in the future, I plan to use them frequently after graduation ถ้าMOOCsมีความหลากหลายมากยิ่งขึ้นในอนาคตฉันวางแผนที่จะใช้มันบ่อยมากขึ้นหลังจากสำเร็จการศึกษา					

Part 4: Questions about the Absorptive Capacity of the Respondents

Absorptive Capacity ความสามารถในการดูดซับความรู้	1	2	3	4	5
Knowledge Acquisition การได้มาซึ่งความรู้					
42) I am able to generate an environment of trust using MOOCs. ฉันได้รับความสามารถสำหรับการสร้างสภาพแวดล้อมที่ไว้วางใจได้ผ่านการใช้ MOOCs					

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า ไม่ว่าจะกรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Absorptive Capacity ความสามารถในการดูดซับความรู้	1	2	3	4	5
43) I am able to acquire information using MOOCs for my learning activities. ฉันได้ความรู้ในการเข้าถึงสารสนเทศต่างๆ จากการใช้ MOOCs สำหรับกิจกรรมการเรียนรู้					
44) I am able to obtain latest knowledge in education-related issues using MOOCs ฉันได้ความรู้ล่าสุดในประเด็นที่เกี่ยวข้องกับการศึกษาโดยใช้ MOOCs					
Knowledge Assimilation การดูดซึมความรู้					
45) I am able to learn through interactive discussions forum using MOOCs ฉันได้ความสามารถในการเรียนรู้ จากการใช้ Forum เพื่อสนทนาเชิงโต้ตอบ โดยใช้ MOOCs					
46) I am able to communicate my ideas regularly using MOOCs ฉันได้ความสามารถในการสื่อสารความคิด จากการใช้ MOOCs เป็นประจำ					
47) I am able to assimilate research and education-related issues using MOOCs ฉันได้ความสามารถในการผสมผสานความรู้ด้านการวิจัยและการศึกษา จากการใช้ MOOCs					
Knowledge Transformation การเปลี่ยนแปลงความรู้					
48) I am able to share important knowledge using MOOCs ฉันได้ความสามารถในการถ่ายทอดความรู้ จากการใช้ MOOCs					
49) MOOCs make it easier to share knowledge MOOCs ช่วยให้แบ่งปันความรู้ได้ง่ายขึ้น					

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Part 5: Questions about the Perceived Autonomy of the Respondents

Perceived Autonomy การรับรู้ความเป็นอิสระ	1	2	3	4	5
Sense of Responsibility ความรู้สึกรับผิดชอบ					
50) I have good study habits and time management using MOOCs ฉันมีนิสัยการเรียนและการจัดการเวลาที่ดีจากการใช้ MOOCs					
51) I have autonomous work habits using MOOCs ฉันมีนิสัยการทำงานที่เป็นอิสระ โดยไม่ต้องมีใครควบคุม จากการใช้ MOOCs					
52) I have a great sense of personal responsibility using MOOCs ฉันมีความรับผิดชอบในตนเองมาก จากการใช้ MOOCs					
Self-Confidence ความมั่นใจในตัวเอง					
53) I feel confident in my ability to learn using MOOCs ฉันมีความมั่นใจในการเรียนรู้มากขึ้น เมื่อใช้ MOOCs					
54) I show initiative and judgment in carrying out my learning activities when using MOOCs ฉันสามารถแสดงความคิดริเริ่มและวิจารณญาณในการดำเนินกิจกรรมการเรียนรู้ของฉันจากการใช้ MOOCs					
Freedom เสรีภาพ					
55) Using MOOCs gives me learning freedom การใช้ MOOCs ช่วยให้ฉันมีอิสระในการเรียนรู้					
56) I usually feel free to make my own decision using MOOCs ฉันมักจะตัดสินใจเรื่องต่างๆ ได้ด้วยตัวเอง จากการใช้ MOOCs					
57) Using MOOCs, I can decide which activities I want to learn at a time that is appropriate for me ฉันสามารถตัดสินใจได้ว่าฉันต้องการเรียนรู้กิจกรรมใดโดยใช้ MOOCs ให้ได้ตามกำหนดเวลาที่มี					

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**Part 6: Questions about uncertainty avoidance and individualism/collectivism
dimension of culture**

Culture วัฒนธรรม	1	2	3	4	5
<p>Individualism/Collectivism ปัจเจกนิยม/การรวมกลุ่ม</p> <p>58) I get better learning results when I study as a MOOC group member than when I study independently on my own การเรียนรู้ด้วย MOOCs ในฐานะสมาชิกของกลุ่มมีความสำคัญมากกว่าการเรียนรู้คนเดียว</p>					
<p>59) Group success is more important than individual success while studying MOOCs การเรียนรู้ด้วย MOOCs ความสำเร็จของกลุ่มมีความสำคัญมากกว่าความสำเร็จของแต่ละบุคคล</p>					
<p>60) Group loyalty should be encouraged even if individual goals suffer while studying MOOCs แม้ว่าเป้าหมายของแต่ละคนจะมีความสำคัญ แต่ก็ควรมีการส่งเสริมให้เกิดความภักดีแบบกลุ่มในการเรียน MOOCs ด้วย</p>					
<p>Uncertainty Avoidance การหลีกเลี่ยงความไม่แน่นอน</p> <p>61) Studying MOOCs, rules, and regulations are important because they inform me what is expected of me การเรียนรู้เกี่ยวกับ กฎและข้อบังคับเป็นสิ่งสำคัญในการเรียนด้วย MOOCs เพราะทำให้ทราบถึงสิ่งที่ระบบคาดหวังจากฉัน</p>					
<p>62) Studying the order and structure of MOOCs learning modules is important การศึกษาถึงลำดับและโครงสร้างของโมดูลการเรียนรู้ใน MOOCs มีความสำคัญ</p>					
<p>63) It is important to have detailed learning outcomes in details so that I always know what I'm expected to study การมีรายละเอียดผลการเรียนรู้ ใน MOOCs เป็นสิ่งสำคัญเพราะทำให้ทราบว่าผู้เรียนต้องการอะไรจากการเรียนนี้</p>					

Culture วัฒนธรรม	1	2	3	4	5
64) It is important to follow MOOCs instructions and procedures closely สิ่งสำคัญในการเรียนด้วย MOOCs คือผู้เรียนต้องปฏิบัติตามคำแนะนำและขั้นตอนการศึกษาอย่างใกล้ชิด					
65) Standardized work procedures are helpful when studying with MOOCs การเรียนด้วย MOOCs จะทำให้ขั้นตอนการทำงานเป็นมาตรฐานและเป็นประโยชน์					
66) Learners should avoid shift to using MOOCs because it is a better learning tool ผู้เรียนควรเปลี่ยนมาใช้ MOOCs เพราะจะช่วยทำให้สิ่งต่างๆ ดีขึ้น					

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APPENDIX C

INSTRUMENT VALIDITY AND RELIABILITY ASSESSMENT THE INDEX OF CONGRUENCE (IOC)

To evaluate the validity of the instruments, the Item of Congruence (IOC) was used. A team of 5 experts as academicians and executives, who have used MOOCs were asked to evaluate whether the questions were appropriate, and whether any improvements were important. In addition to this evaluation, there were the instrument calculation for the IOC between each question and variables. The questions, which had an IOC greater than 0.05 was considered appropriate. $IOC = \frac{\sum R}{N}$

Where: R = Congruence value of each Question

N = the number of experts

1 = Congruent

0 = Uncertainty

-1 = Incongruent

The IOC ranges from -1 to +1. Hence, a question was considered good the closer it is to +1. The questions having an IOC, which is less than 0.6, were revised. Those with IOC less than 0.5 were excluded from the questionnaire (Turner & Carlson, 2003). The range of IOC included:

+1 = the questions were found to be congruent with the content

0 = the questions are uncertain if the questions would be congruent with the content

-1 = the questions are found to be incongruent with the content

The consideration criteria for the IOC was as follows:

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1. Questions having IOC between 0.5 – 1.00 = Valid and can be used
2. Questions with IOC below 0.5 = To be revised

To assure the consistency and validity of the instrument, the questionnaire was assessed by two professors and one expert who has an abundance of knowledge and experience in terms of Information system and technology to consider and review whether all details were simple to comprehend and meet the points or not. Firstly, Dr. Vasu Keerativutisest, specialized in research related to technology management. Secondly, Dr. Apichaya Nimkoompai who has skillful and expert in the area of Digital Disruption and Business Management. Thirdly, Dr. Paneepan Sombat specialize in eLearning and business management domain. Lastly, Mr. Michal Herzog and Ms. Divona Herzog who are the entrepreneurs and owners of eLearning courses registered in Canada and have number of local and international clients. The results are presented below.

	Questions	Dr. Paneepan Sombat	Dr. Vasu Keerati vutisest	Dr. Apichaya Nim koompai	Mr. Michal Herzog	Ms. Divona Herzog	Total	IOC index
1	Using MOOCs enables me to accomplish my learning activities more quickly	1	1	1	1	1	5	1
2	Using MOOCs improves my learning performance (i.e., Develop New Skills, Techniques and Gain Experience)	1	1	1	1	1	5	1
3	Using MOOCs increases productivity in my learning activities (i.e., able to learn and understand large amount of information)	1	1	0	1	1	4	1
4	Using MOOCs enhances effectiveness in my learning activities (i.e., Gain comprehensive knowledge and greater understanding about course being studied for improving grades and academic performance)	1	1	0	1	1	4	1

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5	Using MOOCs would make makes it easier to complete my courses and modules faster	1	1	1	1	1	5	1
6	I find MOOCs useful in my learning activities	1	1	1	1	1	5	1
7	Using MOOCs enables me to learn more quickly as compared to traditional classroom	1	1	1	1	1	5	1
8	Using MOOCs improves the quality of my learning activities (i.e., To achieve better grades and improve academic performance).	1	1	1	1	1	5	1
9	If I use MOOCs, I will increase the chances of getting higher marks on tests and exams for the same amount of effort	1	1	1	1	1	5	1
10	If I use MOOCs, my classmates will perceive me as competent	1	1	0	1	1	4	1
11	If I use MOOCs, I will increase my chances of advancing to the next level	1	1	0	1	1	4	1
12	Learning to operate MOOCs is easy for me	1	1	1	1	1	5	1
13	My interaction with MOOCs is clear and understandable	1	1	0	1	1	4	1
14	I find MOOCs to be flexible to interact with	1	1	1	0	0	3	1
15	It is easy for me to become skillful at using MOOCs	1	1	1	1	1	5	1
16	I believe I require little effort to understand how MOOCs works	1	1	1	1	1	5	1
17	Overall, I believe that MOOCs are easy to use	0	1	1	1	1	4	1
18	People who influence my behavior think that I should use MOOCs	1	1	0	1	1	4	1

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ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

19	People who are important to me think I should use MOOCs	1	1	1	1	1	5	1
20	My learning institution supports the use of MOOCs	1	1	1	1	1	5	1
21	Learners who use MOOCs enjoy more prestige than those who do not	1	1	0	1	1	4	1
22	Learners who use MOOCs have a high profile	1	1	0	1	1	4	1
23	My peers think that I should use MOOCs	1	1	1	1	1	5	1
24	I have the necessary resources to use MOOCs	1	1	1	1	1	5	1
25	I have the necessary knowledge to use MOOCs	1	1	1	1	1	5	1
26	Guidance is available to me in the selection of MOOCs	1	1	1	1	1	5	1
27	Specialized instructions concerning MOOCs is available to me	1	1	1	1	1	5	1
28	I get support from a specific person/group when I face difficulties with MOOCs	1	1	1	1	1	5	1
29	Using MOOCs fits my learning style	1	1	1	1	1	5	1
30	I intend to use MOOCs immediately	1	1	0	1	0	3	1
31	I intend to use MOOCs in future learning sessions	1	1	1	1	1	5	1
32	I intend to utilize MOOCs for various purposes such as self-development as well as earning credit hours	1	1	1	1	1	5	1
33	If MOOCs become more diverse in the future, I intend to use them frequently after graduation	1	1	1	1	1	5	1
34	I predict I will use MOOCs in future learning sessions	1	1	1	1	1	5	1
35	I predict I will use MOOCs immediately	1	1	1	1	1	5	1

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36	I predict I will utilize MOOCs for various purposes such as self-development as well as earning credit hours	1	1	1	1	1	5	1
37	If MOOCs become more diverse in the future, I predict I will use them frequently after graduation	1	1	1	1	1	5	1
38	I plan to use MOOCs in future learning sessions	1	1	1	1	1	5	1
39	I plan to use MOOCs immediately	1	1	1	1	1	5	1
40	I plan to utilize MOOCs for various purposes such as self-development as well as earning credit hours	1	1	1	1	1	5	1
41	If MOOCs become more diverse in the future, I plan to use them frequently after graduation	1	1	1	1	1	5	1
42	I am able to generate an environment of trust using MOOCs.	1	0	0	1	1	3	1
43	I am able to acquire information using MOOCs for my learning activities.	1	1	1	1	1	5	1
44	I am able to obtain latest knowledge in education-related issues using MOOCs	1	1	1	1	1	5	1
45	I am able to learn through interactive discussions forum using MOOCs	1	1	1	1	1	5	1
46	I am able to communicate my ideas regularly using MOOCs	1	1	1	1	1	5	1
47	I am able to assimilate research and education-related issues using MOOCs	1	1	1	1	1	5	1
48	I am able to transmit important knowledge using MOOCs	1	1	1	1	1	5	1
49	MOOCs make it easier to share knowledge	1	1	1	1	1	5	1
50	I have good study habits and time	1	1	1	1	1	5	1

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	management using MOOCs							
51	I have autonomous work habits using MOOCs	1	1	1	1	1	5	1
52	I have a great sense of personal responsibility using MOOCs	1	1	1	1	1	5	1
53	I feel confident in my ability to learn using MOOCs	1	1	0	1	1	4	1
54	I show initiative and judgment in carrying out my learning activities when using MOOCs	1	1	0	1	1	4	1
55	Using MOOCs gives me learning freedom	1	1	1	1	1	5	1
56	I usually feel free to make my own decision using MOOCs	1	1	0	1	1	4	1
57	Using MOOCs, I can decide which activities I want to learn at a time that is appropriate for me	1	1	1	1	1	5	1
58	With MOOCs, studying as a member of the group is more important than having autonomy and independence	1	1	0	1	1	4	1
59	Group success is more important than individual success while studying with MOOCs	1	1	0	1	1	4	1
60	Group loyalty should be encouraged even if individual goals suffer while studying with MOOCs	1	1	1	1	1	5	1
61	Studying MOOCs, rules, and regulations are important because they inform me of what is expected	1	1	1	1	1	5	1
62	Studying the order and structure of MOOCs learning modules is important	1	1	1	1	1	5	1
63	It is important to have detailed learning	1	1	1	1	1	5	1

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	outcomes so that I always know what I'm expected to study							
64	It is important to follow MOOCs instructions and procedures closely	1	1	1	1	1	5	1
65	Standardized work procedures are helpful when studying with MOOCs	1	1	1	1	1	5	1
66	Learners should shift to using MOOCs because it is a better learning tool	1	1	0	1	1	4	1

THE RELIABILITY OF THE INSTRUMENT

To evaluate the reliability of the instrument, the Cronbach's alpha was calculated to evaluate the entire questionnaire. Cronbach's alpha greater than 0.7 was considered acceptable (Gliem & Gliem, 2003). Cronbach's alpha was evaluated using the following criteria.

Cronbach's Alpha	External Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Gliem & Gliem, (2003)

The formula for developing the Cronbach's alpha is presented by (Gliem & Gliem, 2003). The coefficient of alpha ranges from 0 – 1 were, as presented in the above criteria, the higher the Cronbach's alpha, the better the reliability of the questions. The calculations are presented below:

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$$\alpha = \frac{K}{K-1} \left[1 - \frac{\sum S_i^2}{S_t^2} \right]$$

Where:

α = Reliability coefficient

k = the number of questions of the instrument

S_i^2 = Variance of score in each question

S_t^2 = Variance of total score of all respondents

In the interpretation of results, the Cronbach's alpha coefficient would be considered acceptable if it is above 0.70. However, if it is below 0.7, it would be necessary to re-evaluate the questions of the questionnaire. To check the accuracy and internal consistency of the instruments, two tests were conducted; first with a pilot study sample (n = 30). The researcher used SPSS version 26 to conduct Cronbach's tests and the results. The results are presented below.

Cronbach's Alpha from a Pilot Study (n = 30)

Case Processing Summary

		n	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	n of Items
.983	.983	66

APPENDIX D

SKEWNESS AND KURTOSIS RESULTS

Skewness and Kurtosis results

	Thailand		Pakistan	
	Skewness	Kurtosis	Skewness	Kurtosis
Mean Performance Expectancy	-0.22309	-0.444	-0.47527	-0.43855
Perceived Usefulness 1	-0.241	-0.455	-0.424	-0.46
Perceived Usefulness 2	-0.285	-0.209	-0.668	-0.18
Perceived Usefulness 3	-0.299	-0.367	-0.561	-0.384
Perceived Usefulness 4	-0.331	-0.056	-0.414	-0.597
Perceived Usefulness 5	-0.219	-0.41	-0.536	-0.355
Perceived Usefulness 6	-0.248	-0.729	-0.584	-0.2
Relative Advantage 1	-0.201	-0.588	-0.252	-0.87
Relative Advantage 2	-0.139	-0.576	-0.482	-0.35
Outcome Expectations 1	-0.184	-0.45	-0.486	-0.442
Outcome Expectations 2	-0.252	-0.43	-0.308	-0.554
Outcome Expectations 3	-0.055	-0.614	-0.513	-0.432
Mean Effort Expectancy	-0.20683	-0.62667	-0.51967	-0.31633
Perceived Ease of Use 1	-0.275	-0.66	-0.621	-0.021
Perceived Ease of Use 2	-0.198	-0.549	-0.541	-0.367
Perceived Ease of Use 3	-0.203	-0.657	-0.372	-0.587
Perceived Ease of Use 4	-0.104	-0.733	-0.507	-0.344
Ease of Use 1	-0.271	-0.342	-0.581	-0.285
Ease of Use 2	-0.19	-0.819	-0.496	-0.294
Mean Social Influence	-0.35433	-0.10217	-0.38133	-0.464
General Social Influence 1	-0.449	0.152	-0.307	-0.529

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General Social Influence 2	-0.157	-0.484	-0.341	-0.446
General Social Influence 3	-0.246	-0.126	-0.457	-0.397
Peer Social Influence 1	-0.467	-0.247	-0.39	-0.532
Peer Social Influence 2	-0.448	-0.005	-0.395	-0.436
Peer Social Influence 3	-0.359	0.097	-0.398	-0.444
Mean Facilitating Conditions	-0.32867	-0.1605	-0.43883	-0.50567
Perceived Behavioral Control 1	-0.367	-0.421	-0.492	-0.471
Perceived Behavioral Control 2	-0.18	-0.392	-0.604	-0.265
Facilitating Conditions 1	-0.36	0.09	-0.405	-0.516
Facilitating Conditions 2	-0.418	-0.007	-0.334	-0.58
Facilitating Conditions 3	-0.356	-0.176	-0.402	-0.597
Facilitating Conditions 4	-0.291	-0.057	-0.396	-0.605
Mean Behavioral Intention to use	-0.155	-0.498	-0.5335	-0.30058
Intention 1	-0.094	-0.285	-0.379	-0.4
Intention 2	-0.069	-0.751	-0.585	-0.214
Intention 3	-0.158	-0.614	-0.608	-0.211
Intention 4	-0.159	-0.466	-0.613	-0.3
Prediction 1	-0.198	-0.685	-0.573	-0.289
Prediction 2	-0.197	-0.282	-0.296	-0.502
Prediction 3	-0.121	-0.634	-0.55	-0.335
Prediction 4	-0.186	-0.762	-0.619	-0.267
Planning 1	-0.024	-0.696	-0.575	-0.29
Planning 2	-0.358	0.035	-0.476	-0.38
Planning 3	-0.15	-0.317	-0.572	-0.226
Planning 4	-0.146	-0.519	-0.556	-0.193
Mean Absorptive Capacity	-0.18888	-0.31175	-0.50625	-0.35788
Knowledge Acquisition 1	-0.119	-0.356	-0.48	-0.238

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Knowledge Acquisition 2	-0.189	-0.405	-0.472	-0.331
Knowledge Acquisition 3	-0.287	-0.155	-0.56	-0.346
Knowledge Assimilation 1	-0.148	-0.364	-0.488	-0.417
Knowledge Assimilation 1	-0.155	-0.262	-0.481	-0.405
Knowledge Assimilation 1	-0.329	0.105	-0.459	-0.399
Knowledge Transformation 1	-0.175	-0.357	-0.514	-0.376
Knowledge Transformation 2	-0.109	-0.7	-0.596	-0.351
Mean Perceived Autonomy	-0.21375	-0.37938	-0.48038	-0.32525
Sense of Responsibility 1	-0.31	-0.151	-0.458	-0.358
Sense of Responsibility 2	-0.157	-0.59	-0.501	-0.273
Sense of Responsibility 3	-0.156	-0.522	-0.479	-0.37
Self Confidence 1	-0.324	-0.011	-0.572	-0.328
Self Confidence 2	-0.233	-0.16	-0.45	-0.224
Freedom 1	-0.057	-0.888	-0.55	-0.28
Freedom 2	-0.312	-0.267	-0.395	-0.367
Freedom 3	-0.161	-0.446	-0.438	-0.402
Mean Culture	-0.20422	-0.36778	-0.502	-0.25911
Individualism/Collectivism 1	-0.327	-0.143	-0.485	-0.133
Individualism/Collectivism 2	-0.357	0.196	-0.45	-0.422
Individualism/Collectivism 3	-0.156	-0.348	-0.523	-0.338
Uncertainty Avoidance 1	-0.23	-0.159	-0.395	-0.435
Uncertainty Avoidance 2	-0.12	-0.544	-0.439	-0.405
Uncertainty Avoidance 3	-0.173	-0.811	-0.55	0.027
Uncertainty Avoidance 4	-0.046	-0.72	-0.563	-0.258
Uncertainty Avoidance 5	-0.18	-0.599	-0.613	-0.013
Uncertainty Avoidance 6	-0.249	-0.182	-0.5	-0.355

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APPENDIX E

CFA ANALYSIS RESULTS IN THAILAND

Notes for Group (Group number 1)

The model is recursive.

Sample size = 490

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

PU

RA

OE

EU

PEU

Freedom

SC

SR

PSI

GSI

FC

PBC

KTrans

KAss

KAcq

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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Intention

Prediction

Planning

Unobserved, exogenous variables

EE

PE

PA

SI

FCS

AC

BI

e1

e2

e3

e4

e5

e6

e7

e8

e9

e10

e11

e12

e13

e14



เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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e15

e16

e17

e18

Variable counts (Group number 1)

Number of variables in your model: 43

Number of observed variables: 18

Number of unobserved variables: 25

Number of exogenous variables: 25

Number of endogenous variables: 18

Parameter Summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	25	0	0	0	0	25
Labeled	0	0	0	0	0	0
Unlabeled	11	21	25	0	0	57
Total	36	21	25	0	0	82

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 171

Number of distinct parameters to be estimated: 57

Degrees of freedom (171 - 57): 114

Result (Default model)

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Minimum was achieved

Chi-square = 354.916

Degrees of freedom = 114

Probability level = .000

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

		Estimate	S.E.	C.R.	P	Label
PU	<--- PE	1.000				
RA	<--- PE	1.171	.052	22.328	***	par_21
OE	<--- PE	1.131	.048	23.779	***	par_22
EU	<--- EE	1.000				
PEU	<--- EE	.937	.036	26.134	***	par_23
Freedom	<--- PA	1.000				
SC	<--- PA	1.042	.037	27.932	***	par_24
SR	<--- PA	.996	.036	27.611	***	par_25
PSI	<--- SI	1.000				
GSI	<--- SI	.840	.056	14.925	***	par_26
FC	<--- FCS	1.000				
PBC	<--- FCS	.859	.047	18.135	***	par_27
KTrans	<--- AC	1.000				
KAss	<--- AC	1.055	.042	25.346	***	par_28

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			Estimate	S.E.	C.R.	P	Label
KAcq	<---	AC	1.079	.042	25.960	***	par_29
Intention	<---	BI	1.000				
Prediction	<---	BI	1.061	.034	31.215	***	par_30
Planning	<---	BI	1.063	.036	29.690	***	par_31

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
PU	<---	PE	.857
RA	<---	PE	.823
OE	<---	PE	.856
EU	<---	EE	.879
PEU	<---	EE	.897
Freedom	<---	PA	.889
SC	<---	PA	.877
SR	<---	PA	.873
PSI	<---	SI	.721
GSI	<---	SI	.769
FC	<---	FCS	.826
PBC	<---	FCS	.726
KTrans	<---	AC	.836
KAss	<---	AC	.884
KAcq	<---	AC	.896
Intention	<---	BI	.882

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	Estimate
Prediction <--- BI	.924
Planning <--- BI	.904

Covariances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
EE <--> PE	.308	.025	12.337	***	par_1
PE <--> PA	.271	.023	11.802	***	par_2
PE <--> SI	.265	.026	10.236	***	par_3
PE <--> FCS	.287	.024	11.822	***	par_4
PE <--> AC	.268	.023	11.705	***	par_5
PE <--> BI	.254	.022	11.643	***	par_6
EE <--> PA	.320	.027	11.786	***	par_7
EE <--> SI	.293	.030	9.811	***	par_8
EE <--> FCS	.355	.029	12.143	***	par_9
EE <--> AC	.302	.027	11.386	***	par_10
PA <--> SI	.320	.030	10.620	***	par_11
PA <--> FCS	.351	.028	12.407	***	par_12
PA <--> AC	.368	.028	12.992	***	par_13
PA <--> BI	.350	.027	13.019	***	par_14
SI <--> FCS	.344	.032	10.726	***	par_15
SI <--> AC	.323	.030	10.697	***	par_16
SI <--> BI	.320	.029	10.885	***	par_17
FCS <--> AC	.349	.028	12.325	***	par_18

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	Estimate	S.E.	C.R.	P	Label
FCS <--> BI	.344	.027	12.544	***	par_19
AC <--> BI	.350	.027	12.900	***	par_20
EE <--> BI	.295	.026	11.514	***	par_32

Correlations: (Group number 1 - Default model)

	Estimate
EE <--> PE	.862
PE <--> PA	.778
PE <--> SI	.768
PE <--> FCS	.849
PE <--> AC	.800
PE <--> BI	.760
EE <--> PA	.766
EE <--> SI	.708
EE <--> FCS	.877
EE <--> AC	.752
PA <--> SI	.793
PA <--> FCS	.889
PA <--> AC	.943
PA <--> BI	.896
SI <--> FCS	.879
SI <--> AC	.834
SI <--> BI	.829

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	Estimate
FCS <--> AC	.922
FCS <--> BI	.908
AC <--> BI	.934
EE <--> BI	.736

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
EE	.429	.036	11.949	***	par_33
PE	.298	.026	11.536	***	par_34
PA	.406	.033	12.416	***	par_35
SI	.399	.047	8.416	***	par_36
FCS	.383	.036	10.530	***	par_37
AC	.375	.033	11.296	***	par_38
BI	.374	.030	12.305	***	par_39
e1	.108	.009	11.408	***	par_40
e2	.196	.016	12.473	***	par_41
e3	.139	.012	11.450	***	par_42
e4	.126	.013	9.961	***	par_43
e5	.091	.010	8.802	***	par_44
e6	.108	.009	11.822	***	par_45
e7	.132	.011	12.260	***	par_46
e8	.126	.010	12.421	***	par_47
e9	.368	.031	11.928	***	par_48

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	Estimate	S.E.	C.R.	P	Label
e10	.195	.019	10.369	***	par_49
e11	.179	.017	10.433	***	par_50
e12	.252	.019	13.513	***	par_51
e13	.161	.012	13.667	***	par_52
e14	.117	.009	12.502	***	par_53
e15	.107	.009	11.998	***	par_54
e16	.107	.008	12.716	***	par_55
e17	.072	.007	10.661	***	par_56
e18	.095	.008	11.864	***	par_57

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
Planning	.817
Prediction	.854
Intention	.777
KAcq	.803
KAss	.781
KTrans	.699
PBC	.528
FC	.682
GSI	.591
PSI	.520
SR	.762

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

	Estimate
SC	.770
Freedom	.790
PEU	.805
EU	.773
OE	.733
RA	.677
PU	.735

Matrices (Group number 1 - Default model)

Factor Score Weights (Group number 1 - Default model)

	Plan Prediction	Intention	KA	KA	KTr	PB	FC	GS	PSI	SR	SC	Free	PE	EU	OE	RA	PU
	ning	tion	sq	ss	ans	C						dom	U				
BI	.206	.270	.171	.052	.043	.038	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
AC	.058	.076	.048	.182	.133	.122	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
FS	.060	.078	.050	.065	.058	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
SI	.051	.067	.042	.043	.038	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Plan ning	Predi ction	Inte ntion	KA cq	KA ss	KTr ans	PB C	FC	GSI	PSI	SR	SC	Free dom	PE U	EU	OE	RA	PU
PA	.033	.044	.028	.075	.067	.047	.009	.004	.000	.000	.018	.011	.217	.025	.019	.000	.000	.000
PE	.030	.040	.003	.024	.021	.015	.000	.006	.001	.003	.007	.007	.008	.075	.058	.026	.015	.026
EE	.005	.006	.004	.007	.007	.004	.009	.005	.000	.000	.009	.009	.002	.384	.206	.009	.005	.006

Total Effects (Group number 1 - Default model)

	BI	AC	FCS	SI	PA	PE	EE
Planning	1.063	.000	.000	.000	.000	.000	.000
Prediction	1.061	.000	.000	.000	.000	.000	.000
Intention	1.000	.000	.000	.000	.000	.000	.000
KAcq	.000	1.079	.000	.000	.000	.000	.000
KAss	.000	1.055	.000	.000	.000	.000	.000
KTrans	.000	1.000	.000	.000	.000	.000	.000
PBC	.000	.000	.859	.000	.000	.000	.000
FC	.000	.000	1.000	.000	.000	.000	.000
GSI	.000	.000	.000	.840	.000	.000	.000
PSI	.000	.000	.000	1.000	.000	.000	.000
SR	.000	.000	.000	.000	.996	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	BI	AC	FCS	SI	PA	PE	EE
SC	.000	.000	.000	.000	1.042	.000	.000
Freedom	.000	.000	.000	.000	1.000	.000	.000
PEU	.000	.000	.000	.000	.000	.000	.937
EU	.000	.000	.000	.000	.000	.000	1.000
OE	.000	.000	.000	.000	.000	1.131	.000
RA	.000	.000	.000	.000	.000	1.171	.000
PU	.000	.000	.000	.000	.000	1.000	.000

Standardized Total Effects (Group number 1 - Default model)

	BI	AC	FCS	SI	PA	PE	EE
Planning	.904	.000	.000	.000	.000	.000	.000
Prediction	.924	.000	.000	.000	.000	.000	.000
Intention	.882	.000	.000	.000	.000	.000	.000
KAcq	.000	.896	.000	.000	.000	.000	.000
KAss	.000	.884	.000	.000	.000	.000	.000
KTrans	.000	.836	.000	.000	.000	.000	.000
PBC	.000	.000	.726	.000	.000	.000	.000
FC	.000	.000	.826	.000	.000	.000	.000
GSI	.000	.000	.000	.769	.000	.000	.000
PSI	.000	.000	.000	.721	.000	.000	.000
SR	.000	.000	.000	.000	.873	.000	.000
SC	.000	.000	.000	.000	.877	.000	.000
Freedom	.000	.000	.000	.000	.889	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	BI	AC	FCS	SI	PA	PE	EE
PEU	.000	.000	.000	.000	.000	.000	.897
EU	.000	.000	.000	.000	.000	.000	.879
OE	.000	.000	.000	.000	.000	.856	.000
RA	.000	.000	.000	.000	.000	.823	.000
PU	.000	.000	.000	.000	.000	.857	.000

Direct Effects (Group number 1 - Default model)

	BI	AC	FCS	SI	PA	PE	EE
Planning	1.063	.000	.000	.000	.000	.000	.000
Prediction	1.061	.000	.000	.000	.000	.000	.000
Intention	1.000	.000	.000	.000	.000	.000	.000
KAcq	.000	1.079	.000	.000	.000	.000	.000
KAss	.000	1.055	.000	.000	.000	.000	.000
KTrans	.000	1.000	.000	.000	.000	.000	.000
PBC	.000	.000	.859	.000	.000	.000	.000
FC	.000	.000	1.000	.000	.000	.000	.000
GSI	.000	.000	.000	.840	.000	.000	.000
PSI	.000	.000	.000	1.000	.000	.000	.000
SR	.000	.000	.000	.000	.996	.000	.000
SC	.000	.000	.000	.000	1.042	.000	.000
Freedom	.000	.000	.000	.000	1.000	.000	.000
PEU	.000	.000	.000	.000	.000	.000	.937
EU	.000	.000	.000	.000	.000	.000	1.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	BI	AC	FCS	SI	PA	PE	EE
OE	.000	.000	.000	.000	.000	1.131	.000
RA	.000	.000	.000	.000	.000	1.171	.000
PU	.000	.000	.000	.000	.000	1.000	.000

Standardized Direct Effects (Group number 1 - Default model)

	BI	AC	FCS	SI	PA	PE	EE
Planning	.904	.000	.000	.000	.000	.000	.000
Prediction	.924	.000	.000	.000	.000	.000	.000
Intention	.882	.000	.000	.000	.000	.000	.000
KAcq	.000	.896	.000	.000	.000	.000	.000
KAss	.000	.884	.000	.000	.000	.000	.000
KTrans	.000	.836	.000	.000	.000	.000	.000
PBC	.000	.000	.726	.000	.000	.000	.000
FC	.000	.000	.826	.000	.000	.000	.000
GSI	.000	.000	.000	.769	.000	.000	.000
PSI	.000	.000	.000	.721	.000	.000	.000
SR	.000	.000	.000	.000	.873	.000	.000
SC	.000	.000	.000	.000	.877	.000	.000
Freedom	.000	.000	.000	.000	.889	.000	.000
PEU	.000	.000	.000	.000	.000	.000	.897
EU	.000	.000	.000	.000	.000	.000	.879
OE	.000	.000	.000	.000	.000	.856	.000
RA	.000	.000	.000	.000	.000	.823	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	BI	AC	FCS	SI	PA	PE	EE
PU	.000	.000	.000	.000	.000	.857	.000

Indirect Effects (Group number 1 - Default model)

	BI	AC	FCS	SI	PA	PE	EE
Planning	.000	.000	.000	.000	.000	.000	.000
prediction	.000	.000	.000	.000	.000	.000	.000
Intention	.000	.000	.000	.000	.000	.000	.000
KAcq	.000	.000	.000	.000	.000	.000	.000
KAss	.000	.000	.000	.000	.000	.000	.000
KTrans	.000	.000	.000	.000	.000	.000	.000
PBC	.000	.000	.000	.000	.000	.000	.000
FC	.000	.000	.000	.000	.000	.000	.000
GSI	.000	.000	.000	.000	.000	.000	.000
PSI	.000	.000	.000	.000	.000	.000	.000
SR	.000	.000	.000	.000	.000	.000	.000
SC	.000	.000	.000	.000	.000	.000	.000
Freedom	.000	.000	.000	.000	.000	.000	.000
PEU	.000	.000	.000	.000	.000	.000	.000
EU	.000	.000	.000	.000	.000	.000	.000
OE	.000	.000	.000	.000	.000	.000	.000
RA	.000	.000	.000	.000	.000	.000	.000
PU	.000	.000	.000	.000	.000	.000	.000

Standardized Indirect Effects (Group number 1 - Default model)

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	BI	AC	FCS	SI	PA	PE	EE
Planning	.000	.000	.000	.000	.000	.000	.000
prediction	.000	.000	.000	.000	.000	.000	.000
Intention	.000	.000	.000	.000	.000	.000	.000
KAcq	.000	.000	.000	.000	.000	.000	.000
KAss	.000	.000	.000	.000	.000	.000	.000
KTrans	.000	.000	.000	.000	.000	.000	.000
PBC	.000	.000	.000	.000	.000	.000	.000
FC	.000	.000	.000	.000	.000	.000	.000
GSI	.000	.000	.000	.000	.000	.000	.000
PSI	.000	.000	.000	.000	.000	.000	.000
SR	.000	.000	.000	.000	.000	.000	.000
SC	.000	.000	.000	.000	.000	.000	.000
Freedom	.000	.000	.000	.000	.000	.000	.000
PEU	.000	.000	.000	.000	.000	.000	.000
EU	.000	.000	.000	.000	.000	.000	.000
OE	.000	.000	.000	.000	.000	.000	.000
RA	.000	.000	.000	.000	.000	.000	.000
PU	.000	.000	.000	.000	.000	.000	.000

Model Fit Summary

CMIN

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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Model	NP	PAR	CMIN	DF	P	CMIN/DF
Default model	57	354.916	114	.000	3.113	
Saturated model	171	.000	0			
Independence model	18	8350.834	153	.000	54.581	

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.013	.923	.885	.616
Saturated model	.000	1.000		
Independence model	.312	.131	.029	.118

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.957	.943	.971	.961	.971
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.745	.713	.723
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	240.916	187.900	301.552
Saturated model	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Model	NCP	LO 90	HI 90
Independence model	8197.834	7901.759	8500.226

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.726	.493	.384	.617
Saturated model	.000	.000	.000	.000
Independence model	17.077	16.764	16.159	17.383

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.066	.058	.074	.000
Independence model	.331	.325	.337	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	468.916	473.524	707.997	764.997
Saturated model	342.000	355.826	1059.243	1230.243
Independence model	8386.834	8388.290	8462.334	8480.334

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.959	.851	1.083	.968
Saturated model	.699	.699	.699	.728
Independence model	17.151	16.546	17.769	17.154

HOELTER

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Model	HOELTER HOELTER	
	.05	.01
Default model	193	210
Independence model	11	12



เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

APPENDIX F

CFA RESULTS FOR PAKISTAN

The model is recursive.

Sample size = 513

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

PU

RA

OE

EU

PEU

Freedom

SC

SR

PSI

GSI

FC

PBC

KTrans

KAss

KAcq

Intention

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

prediction

Planning

Unobserved, exogenous variables

EE

PE

PA

SI

FCS

AC

BI

e1

e2

e3

e4

e5

e6

e7

e8

e9

e10

e11

e12

e13

e14

e15



เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

e16

e17

e18

Variable counts (Group number 1)

Number of variables in your model: 43

Number of observed variables: 18

Number of unobserved variables: 25

Number of exogenous variables: 25

Number of endogenous variables: 18

Parameter Summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	25	0	0	0	0	25
Labeled	0	0	0	0	0	0
Unlabeled	11	21	25	0	0	57
Total	36	21	25	0	0	82

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 171

Number of distinct parameters to be estimated: 57

Degrees of freedom (171 - 57): 114

Result (Default model)

Minimum was achieved

Chi-square = 458.643

Degrees of freedom = 114

Probability level = .000

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
PU	<---	PE	1.000				
RA	<---	PE	1.118	.049	22.836	***	par_21
OE	<---	PE	1.064	.044	24.430	***	par_22
EU	<---	EE	1.000				
PEU	<---	EE	1.071	.052	20.470	***	par_23
Freedom	<---	PA	1.000				
SC	<---	PA	1.076	.039	27.421	***	par_24
SR	<---	PA	1.008	.038	26.285	***	par_25
PSI	<---	SI	1.000				
GSI	<---	SI	.991	.040	24.580	***	par_26
FC	<---	FCS	1.000				
PBC	<---	FCS	.920	.046	20.033	***	par_27
KTrans	<---	AC	1.000				
KAss	<---	AC	.967	.036	26.783	***	par_28
KAcq	<---	AC	.925	.035	26.719	***	par_29
Intention	<---	BI	1.000				

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

	Estimate	S.E.	C.R.	P	Label
prediction <--- BI	1.069	.032	33.168	***	par_30
Planning <--- BI	1.045	.035	29.729	***	par_31

Standardized Regression Weights: (Group number 1 - Default model)

	Estimate
PU <--- PE	.860
RA <--- PE	.821
OE <--- PE	.857
EU <--- EE	.777
PEU <--- EE	.870
Freedom <--- PA	.861
SC <--- PA	.894
SR <--- PA	.873
PSI <--- SI	.843
GSI <--- SI	.881
FC <--- FCS	.878
PBC <--- FCS	.760
KTrans <--- AC	.863
KAss <--- AC	.874
KAcq <--- AC	.873
Intention <--- BI	.880
prediction <--- BI	.943
Planning <--- BI	.897

Covariances: (Group number 1 - Default model)

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Estimate	S.E.	C.R.	P	Label
EE <--> PE	.490	.041	11.816	***	par_1
PE <--> PA	.459	.040	11.556	***	par_2
PE <--> SI	.526	.043	12.312	***	par_3
PE <--> FCS	.525	.043	12.128	***	par_4
PE <--> AC	.523	.044	11.916	***	par_5
PE <--> BI	.479	.041	11.770	***	par_6
EE <--> PA	.452	.040	11.380	***	par_7
EE <--> SI	.481	.041	11.595	***	par_8
EE <--> FCS	.494	.043	11.615	***	par_9
EE <--> AC	.515	.044	11.698	***	par_10
PA <--> SI	.471	.041	11.623	***	par_11
PA <--> FCS	.515	.043	12.052	***	par_12
PA <--> AC	.622	.047	13.114	***	par_13
PA <--> BI	.547	.043	12.729	***	par_14
SI <--> FCS	.583	.046	12.763	***	par_15
SI <--> AC	.552	.045	12.168	***	par_16
SI <--> BI	.515	.042	12.156	***	par_17
FCS <--> AC	.599	.048	12.587	***	par_18
FCS <--> BI	.539	.044	12.306	***	par_19
AC <--> BI	.630	.048	13.153	***	par_20
EE <--> BI	.473	.041	11.594	***	par_32

Correlations: (Group number 1 - Default model)

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

	Estimate
EE <--> PE	.861
PE <--> PA	.737
PE <--> SI	.851
PE <--> FCS	.805
PE <--> AC	.775
PE <--> BI	.743
EE <--> PA	.793
EE <--> SI	.849
EE <--> FCS	.830
EE <--> AC	.834
PA <--> SI	.761
PA <--> FCS	.789
PA <--> AC	.920
PA <--> BI	.848
SI <--> FCS	.900
SI <--> AC	.823
SI <--> BI	.804
FCS <--> AC	.847
FCS <--> BI	.798
AC <--> BI	.901
EE <--> BI	.803

Variances: (Group number 1 - Default model)

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Estimate	S.E.	C.R.	P	Label
EE	.521	.052	10.043	***	par_33
PE	.622	.052	11.861	***	par_34
PA	.624	.052	12.027	***	par_35
SI	.615	.054	11.468	***	par_36
FCS	.682	.058	11.842	***	par_37
AC	.732	.060	12.104	***	par_38
BI	.668	.053	12.537	***	par_39
e1	.219	.019	11.469	***	par_40
e2	.376	.030	12.744	***	par_41
e3	.255	.022	11.607	***	par_42
e4	.341	.026	12.932	***	par_43
e5	.193	.022	8.955	***	par_44
e6	.217	.017	12.628	***	par_45
e7	.182	.016	11.284	***	par_46
e8	.197	.016	12.214	***	par_47
e9	.250	.021	11.856	***	par_48
e10	.174	.018	9.872	***	par_49
e11	.202	.024	8.369	***	par_50
e12	.422	.032	13.346	***	par_51
e13	.252	.019	13.073	***	par_52
e14	.212	.017	12.716	***	par_53
e15	.196	.015	12.753	***	par_54

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

	Estimate	S.E.	C.R.	P	Label
e16	.196	.015	13.032	***	par_55
e17	.094	.011	8.964	***	par_56
e18	.177	.014	12.360	***	par_57

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
Planning	.805
prediction	.890
Intention	.774
KAcq	.762
KAss	.764
KTrans	.744
PBC	.578
FC	.771
GSI	.776
PSI	.711
SR	.762
SC	.799
Freedom	.742
PEU	.756
EU	.604
OE	.734
RA	.674

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

	Estimate
PU	.740

Matrices (Group number 1 - Default model)

Factor Score Weights (Group number 1 - Default model)

	Plan prediction	Intention	KA cq	KA ss	KTr ans	PB C	FC	GSI	PSI	SR	SC	Free dom	PE U	EU	OE	RA	PU
BI	.193	.370	.167	.034	.003	.000	.000	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000
AC	.043	.082	.037	.198	.185	.168	.040	.119	.163	.163	.173	.056	.026	.000	.000	.000	.000
FC	.011	.021	.009	.038	.037	.035	.134	.184	.184	.184	.184	.033	.033	.000	.000	.000	.000
SI	.020	.038	.007	.165	.165	.165	.009	.306	.205	.000	.000	.000	.000	.000	.000	.000	.000
PA	.019	.037	.007	.158	.158	.158	.001	.000	.000	.200	.200	.109	.000	.000	.000	.000	.000
PE	.004	.007	.003	.088	.088	.088	.002	.009	.001	.008	.000	.007	.008	.006	.003	.002	.006

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Plan ning	predi ction	Inte ntio n	KA cq	KA ss	KTr ans	PB C	FC	GSI	PSI	SR	SC	Free dom	PE U	EU	OE	RA	PU	
EE	.0 1 6	.0 30	.0 1 4	. 0 2 2	. 0 2 1	. 0 1 8	. 0 1 4	. 0 3 3	.0 4 4	.0 3 1	.0 1 6	.0 1 9	.0 1 5	. 3 0 1	. 1 5 9	. 0 5 1	. 0 5 1	. 0 3 6	. 0 5 6

Total Effects (Group number 1 - Default model)

	B_I	A_C	F_C_S	S_I	P_A	P_E	E_E
Planning	1.045	.000	.000	.000	.000	.000	.000
prediction	1.069	.000	.000	.000	.000	.000	.000
Intention	1.000	.000	.000	.000	.000	.000	.000
KAcq	.000	.925	.000	.000	.000	.000	.000
KAss	.000	.967	.000	.000	.000	.000	.000
KTrans	.000	1.000	.000	.000	.000	.000	.000
PBC	.000	.000	.920	.000	.000	.000	.000
FC	.000	.000	1.000	.000	.000	.000	.000
GSI	.000	.000	.000	.991	.000	.000	.000
PSI	.000	.000	.000	1.000	.000	.000	.000
SR	.000	.000	.000	.000	1.008	.000	.000
SC	.000	.000	.000	.000	1.076	.000	.000
Freedom	.000	.000	.000	.000	1.000	.000	.000
PEU	.000	.000	.000	.000	.000	.000	1.071
EU	.000	.000	.000	.000	.000	.000	1.000
OE	.000	.000	.000	.000	.000	1.064	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	B_I	A_C	F_C_S	S_I	P_A	P_E	E_E
RA	.000	.000	.000	.000	.000	1.118	.000
PU	.000	.000	.000	.000	.000	1.000	.000

Standardized Total Effects (Group number 1 - Default model)

	B_I	A_C	F_C_S	S_I	P_A	P_E	E_E
Planning	.897	.000	.000	.000	.000	.000	.000
prediction	.943	.000	.000	.000	.000	.000	.000
Intention	.880	.000	.000	.000	.000	.000	.000
KAcq	.000	.873	.000	.000	.000	.000	.000
KAss	.000	.874	.000	.000	.000	.000	.000
KTrans	.000	.863	.000	.000	.000	.000	.000
PBC	.000	.000	.760	.000	.000	.000	.000
FC	.000	.000	.878	.000	.000	.000	.000
GSI	.000	.000	.000	.881	.000	.000	.000
PSI	.000	.000	.000	.843	.000	.000	.000
SR	.000	.000	.000	.000	.873	.000	.000
SC	.000	.000	.000	.000	.894	.000	.000
Freedom	.000	.000	.000	.000	.861	.000	.000
PEU	.000	.000	.000	.000	.000	.000	.870
EU	.000	.000	.000	.000	.000	.000	.777
OE	.000	.000	.000	.000	.000	.857	.000
RA	.000	.000	.000	.000	.000	.821	.000
PU	.000	.000	.000	.000	.000	.860	.000

Direct Effects (Group number 1 - Default model)

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	B_I	A_C	F_C_S	S_I	P_A	P_E	E_E
Planning	1.045	.000	.000	.000	.000	.000	.000
prediction	1.069	.000	.000	.000	.000	.000	.000
Intention	1.000	.000	.000	.000	.000	.000	.000
KAcq	.000	.925	.000	.000	.000	.000	.000
KAss	.000	.967	.000	.000	.000	.000	.000
KTrans	.000	1.000	.000	.000	.000	.000	.000
PBC	.000	.000	.920	.000	.000	.000	.000
FC	.000	.000	1.000	.000	.000	.000	.000
GSI	.000	.000	.000	.991	.000	.000	.000
PSI	.000	.000	.000	1.000	.000	.000	.000
SR	.000	.000	.000	.000	1.008	.000	.000
SC	.000	.000	.000	.000	1.076	.000	.000
Freedom	.000	.000	.000	.000	1.000	.000	.000
PEU	.000	.000	.000	.000	.000	.000	1.071
EU	.000	.000	.000	.000	.000	.000	1.000
OE	.000	.000	.000	.000	.000	1.064	.000
RA	.000	.000	.000	.000	.000	1.118	.000
PU	.000	.000	.000	.000	.000	1.000	.000

Standardized Direct Effects (Group number 1 - Default model)

	B_I	A_C	F_C_S	S_I	P_A	P_E	E_E
Planning	.897	.000	.000	.000	.000	.000	.000
prediction	.943	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	B_I	A_C	F_C_SS_I	P_A	P_E	E_E
Intention	.880	.000	.000	.000	.000	.000
KAcq	.000	.873	.000	.000	.000	.000
KAss	.000	.874	.000	.000	.000	.000
KTrans	.000	.863	.000	.000	.000	.000
PBC	.000	.000	.760	.000	.000	.000
FC	.000	.000	.878	.000	.000	.000
GSI	.000	.000	.000	.881	.000	.000
PSI	.000	.000	.000	.843	.000	.000
SR	.000	.000	.000	.000	.873	.000
SC	.000	.000	.000	.000	.894	.000
Freedom	.000	.000	.000	.000	.861	.000
PEU	.000	.000	.000	.000	.000	.870
EU	.000	.000	.000	.000	.000	.777
OE	.000	.000	.000	.000	.000	.857
RA	.000	.000	.000	.000	.000	.821
PU	.000	.000	.000	.000	.000	.860

Indirect Effects (Group number 1 - Default model)

	B_I	A_C	F_C_SS_I	P_A	P_E	E_E
Planning	.000	.000	.000	.000	.000	.000
prediction	.000	.000	.000	.000	.000	.000
Intention	.000	.000	.000	.000	.000	.000
KAcq	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	B_I	A_C	F_C_SS_I	P_A	P_E	E_E
KAss	.000	.000	.000	.000	.000	.000
KTrans	.000	.000	.000	.000	.000	.000
PBC	.000	.000	.000	.000	.000	.000
FC	.000	.000	.000	.000	.000	.000
GSI	.000	.000	.000	.000	.000	.000
PSI	.000	.000	.000	.000	.000	.000
SR	.000	.000	.000	.000	.000	.000
SC	.000	.000	.000	.000	.000	.000
Freedom	.000	.000	.000	.000	.000	.000
PEU	.000	.000	.000	.000	.000	.000
EU	.000	.000	.000	.000	.000	.000
OE	.000	.000	.000	.000	.000	.000
RA	.000	.000	.000	.000	.000	.000
PU	.000	.000	.000	.000	.000	.000

Standardized Indirect Effects (Group number 1 - Default model)

	B_I	A_C	F_C_SS_I	P_A	P_E	E_E
Planning	.000	.000	.000	.000	.000	.000
prediction	.000	.000	.000	.000	.000	.000
Intention	.000	.000	.000	.000	.000	.000
KAcq	.000	.000	.000	.000	.000	.000
KAss	.000	.000	.000	.000	.000	.000
KTrans	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	B_I	A_C	F_C_SS_I	P_A	P_E	E_E
PBC	.000	.000	.000	.000	.000	.000
FC	.000	.000	.000	.000	.000	.000
GSI	.000	.000	.000	.000	.000	.000
PSI	.000	.000	.000	.000	.000	.000
SR	.000	.000	.000	.000	.000	.000
SC	.000	.000	.000	.000	.000	.000
Freedom	.000	.000	.000	.000	.000	.000
PEU	.000	.000	.000	.000	.000	.000
EU	.000	.000	.000	.000	.000	.000
OE	.000	.000	.000	.000	.000	.000
RA	.000	.000	.000	.000	.000	.000
PU	.000	.000	.000	.000	.000	.000

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	57	458.643	114	.000	4.023
Saturated model	171	.000	0		
Independence model	18	8882.377	153	.000	58.055

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.030	.910	.866	.607
Saturated model	.000	1.000		

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

Model	RMR	GFI	AGFI	PGFI
Independence model	.527	.129	.027	.116

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.948	.931	.961	.947	.961
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.745	.707	.716
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	344.643	282.453	414.394
Saturated model	.000	.000	.000
Independence model	8729.377	8423.838	9041.230

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.896	.673	.552	.809
Saturated model	.000	.000	.000	.000
Independence model	17.348	17.050	16.453	17.659

RMSEA

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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Model	RMSE	ALO 90	HI 90	PCLOSE
Default model	.077	.070	.084	.000
Independence model	.334	.328	.340	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	572.643	577.036	814.339	871.339
Saturated model	342.000	355.181	1067.087	1238.087
Independence model	8918.377	8919.765	8994.702	9012.702

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.118	.997	1.255	1.127
Saturated model	.668	.668	.668	.694
Independence model	17.419	16.822	18.028	17.421

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	157	170
Independence model	11	12

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APPENDIX G

SEM ANALYSIS FOR THAILAND

The model is recursive.

Sample size = 490

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

PU

RA

OE

EU

PEU

Freedom

SC

SR

PSI

GSI

FC

PBC

KTrans

KAss

KAcq

Intention

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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prediction

Planning

Unobserved, endogenous variables

PE

EE

BI

Unobserved, exogenous variables

e1

e2

e3

e4

e5

PA

e6

e7

e8

SI

e9

e10

FCS

e11

e12

AC

e13

e14



เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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e15

e16

e17

e18

e20

e21

e19

Variable counts (Group number 1)

Number of variables in your model: 46

Number of observed variables: 18

Number of unobserved variables: 28

Number of exogenous variables: 25

Number of endogenous variables: 21

Parameter Summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	28	0	0	0	0	28
Labeled	0	0	0	0	0	0
Unlabeled	19	0	25	0	0	44
Total	47	0	25	0	0	72

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 171

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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Number of distinct parameters to be estimated: 44

Degrees of freedom (171 - 44): 127

Result (Default model)

Minimum was achieved

Chi-square = 2077.226

Degrees of freedom = 127

Probability level = .000

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

		Estimate	S.E.	C.R.	P	Label
EE	<--- PA	.821	.045	18.394	***	par_17
PE	<--- PA	.705	.037	19.021	***	par_18
BI	<--- AC	.478	.031	15.363	***	par_12
BI	<--- FCS	.196	.030	6.447	***	par_13
BI	<--- SI	.155	.029	5.277	***	par_14
BI	<--- PA	.359	.064	5.589	***	par_15
BI	<--- PE	-.048	.054	-.896	.370	par_16
BI	<--- EE	-.051	.043	-1.178	.239	par_19
PU	<--- PE	1.000				
RA	<--- PE	1.178	.053	22.122	***	par_1
OE	<--- PE	1.117	.049	22.802	***	par_2

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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			Estimate	S.E.	C.R.	P	Label
EU	<---	EE	1.000				
PEU	<---	EE	.961	.041	23.366	***	par_3
Freedom	<---	PA	1.000				
SC	<---	PA	1.023	.039	26.171	***	par_4
SR	<---	PA	.986	.037	26.329	***	par_5
PSI	<---	SI	1.000				
GSI	<---	SI	1.615	.492	3.281	.001	par_6
FC	<---	FCS	1.000				
PBC	<---	FCS	.919	.125	7.341	***	par_7
KTrans	<---	AC	1.000				
KAss	<---	AC	1.080	.045	23.906	***	par_8
KAcq	<---	AC	1.092	.046	23.959	***	par_9
Intention	<---	BI	1.000				
Prediction	<---	BI	1.060	.052	20.362	***	par_10
Planning	<---	BI	1.060	.055	19.419	***	par_11

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
EE	<---	PA	.809
PE	<---	PA	.820
BI	<---	AC	.687
BI	<---	FCS	.279
BI	<---	SI	.168

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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		Estimate
BI	<--- PA	.543
BI	<--- PE	-.062
BI	<--- EE	-.079
PU	<--- PE	.859
RA	<--- PE	.830
OE	<--- PE	.848
EU	<--- EE	.868
PEU	<--- EE	.909
Freedom	<--- PA	.888
SC	<--- PA	.861
SR	<--- PA	.863
PSI	<--- SI	.520
GSI	<--- SI	1.066
FC	<--- FCS	.798
PBC	<--- FCS	.752
KTrans	<--- AC	.826
KAss	<--- AC	.893
KAcq	<--- AC	.895
Intention	<--- BI	.791
Prediction	<--- BI	.858
Planning	<--- BI	.822

Variances: (Group number 1 - Default model)

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Estimate	S.E.	C.R.	P	Label
PA	.406	.033	12.323	***	par_20
SI	.208	.070	2.974	.003	par_21
FCS	.358	.057	6.267	***	par_22
AC	.366	.034	10.906	***	par_23
e20	.098	.011	8.728	***	par_24
e19	.145	.016	9.026	***	par_25
e21	.042	.007	6.407	***	par_26
e1	.106	.010	10.569	***	par_27
e2	.188	.016	11.685	***	par_28
e3	.146	.013	11.047	***	par_29
e4	.136	.015	9.009	***	par_30
e5	.082	.013	6.497	***	par_31
e6	.109	.010	10.940	***	par_32
e7	.149	.012	12.054	***	par_33
e8	.135	.011	11.963	***	par_34
e9	.560	.071	7.887	***	par_35
e10	-.065	.160	-.407	.684	par_36
e11	.204	.048	4.241	***	par_37
e12	.233	.042	5.570	***	par_38
e13	.171	.014	12.486	***	par_39
e14	.108	.011	9.606	***	par_40
e15	.108	.011	9.502	***	par_41

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Estimate	S.E.	C.R.	P	Label
e16	.106	.008	12.524	***	par_42
e17	.072	.007	10.378	***	par_43
e18	.096	.008	11.714	***	par_44

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
EE	.654
PE	.672
BI	.764
Planning	.676
Prediction	.736
Intention	.625
KAcq	.801
KAss	.798
KTrans	.682
PBC	.565
FC	.637
GSI	1.136
PSI	.271
SR	.746
SC	.741
Freedom	.789
PEU	.826

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	Estimate
EU	.754
OE	.719
RA	.689
PU	.738

Matrices (Group number 1 - Default model)

Factor Score Weights (Group number 1 - Default model)

	Plan ning	Pred ictio n	Inte ntio n	KA cq	KA ss	KTr ans	PB C	FC	GSI	PSI	SR	SC	Free dom	PE U	EU	OE	RA	PU
A C	.0	.0	.0	.3	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
	.5	.76	.4	.0	.9	.7	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0
	.7	.8	.8	.2	.9	.5	.3	.6	.2	.2	.4	.3	.8	.1	.0	.1	.1	.1
F S	.0	.0	.0	.0	.0	.0	.3	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
	.6	.84	.5	.0	.3	.3	.3	.1	.0	.0	.1	.1	.2	.0	.0	.0	.0	.0
	.3	.3	.3	.3	.3	.1	.4	.5	.2	.2	.6	.5	.0	.1	.0	.1	.1	.1
S I	.0	.0	.0	.0	.0	.0	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
	.1	.22	.1	.0	.0	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
	.7	.4	.9	.9	.5	.4	.5	.8	.4	.4	.4	.5	.0	.0	.0	.0	.0	.0
P A	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.2	.2	.6	.0	.0	.0	.0	.0
	.3	.50	.3	.0	.0	.0	.0	.0	.0	.0	.1	.0	.8	.7	.4	.4	.3	.5
	.7	.2	.2	.1	.1	.0	.1	.1	.1	.3	.0	.0	.8	.9	.9	.6	.8	.7

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	Plan ning	Pred ictio n	Inte ntio n	KA cq	KA ss	KTr ans	PB C	FC	GSI	PSI	SR	SC	Free dom	PE U	EU	OE	RA	PU	
EE	.0 0 1	.0 01 1	.0 0 1	. 0 0 1	. 0 0 1	. 0 0 0	. 0 0 0	. 0 0 0	. 0 0 0	. 0 0 0	. 0 4 4	. 0 4 6	. 0 6 2	. 4 7 8	. 2 9 8	. 0 1 0	. 0 1 0	. 0 0 9	. 1 1 3
PE	.0 0 3	.0 03 2	.0 0 2	. 0 0 1	. 0 0 1	. 0 0 1	. 0 0 1	. 0 0 1	. 0 0 0	. 0 0 0	. 0 4 4	. 0 4 2	. 0 6 6	. 0 1 6	. 0 1 0	. 0 1 4	. 2 2 4	. 1 8 4	. 2 7 7
BI	.2 0 2	.2 70 2	.1 7 2	. 0 5 2	. 0 5 2	. 0 3 0	. 0 2 2	. 0 2 8	. 0 3 8	. 0 0 3	. 0 2 5	. 0 2 3	. 0 1 3	. 0 0 1	. 0 0 1	. 0 0 2	. 0 0 1	. 0 0 2	. 0 0 1

Total Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
EE	.000	.000	.000	.821	.000	.000	.000
PE	.000	.000	.000	.705	.000	.000	.000
BI	.478	.196	.155	.283	-.051	-.048	.000
Planning	.507	.208	.165	.300	-.054	-.051	1.060
Prediction	.507	.208	.165	.300	-.054	-.051	1.060
Intention	.478	.196	.155	.283	-.051	-.048	1.000
KAcq	1.092	.000	.000	.000	.000	.000	.000
KAss	1.080	.000	.000	.000	.000	.000	.000
KTrans	1.000	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
PBC	.000	.919	.000	.000	.000	.000	.000
FC	.000	1.000	.000	.000	.000	.000	.000
GSI	.000	.000	1.615	.000	.000	.000	.000
PSI	.000	.000	1.000	.000	.000	.000	.000
SR	.000	.000	.000	.986	.000	.000	.000
SC	.000	.000	.000	1.023	.000	.000	.000
Freedom	.000	.000	.000	1.000	.000	.000	.000
PEU	.000	.000	.000	.789	.961	.000	.000
EU	.000	.000	.000	.821	1.000	.000	.000
OE	.000	.000	.000	.787	.000	1.117	.000
RA	.000	.000	.000	.831	.000	1.178	.000
PU	.000	.000	.000	.705	.000	1.000	.000

Standardized Total Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
E_E	.000	.000	.000	.809	.000	.000	.000
P_E	.000	.000	.000	.820	.000	.000	.000
B_I	.687	.279	.168	.428	-.079	-.062	.000
Planning	.564	.229	.138	.352	-.065	-.051	.822
Prediction	.589	.239	.144	.367	-.068	-.054	.858
Intention	.543	.220	.133	.338	-.062	-.049	.791
KAcq	.895	.000	.000	.000	.000	.000	.000
KAss	.893	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

	AC	FCS	SI	PA	EE	PE	BI
KTrans	.826	.000	.000	.000	.000	.000	.000
PBC	.000	.752	.000	.000	.000	.000	.000
FC	.000	.798	.000	.000	.000	.000	.000
GSI	.000	.000	1.066	.000	.000	.000	.000
PSI	.000	.000	.520	.000	.000	.000	.000
SR	.000	.000	.000	.863	.000	.000	.000
SC	.000	.000	.000	.861	.000	.000	.000
Freedom	.000	.000	.000	.888	.000	.000	.000
PEU	.000	.000	.000	.735	.909	.000	.000
EU	.000	.000	.000	.702	.868	.000	.000
OE	.000	.000	.000	.695	.000	.848	.000
RA	.000	.000	.000	.680	.000	.830	.000
PU	.000	.000	.000	.705	.000	.859	.000

Direct Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
EE	.000	.000	.000	.821	.000	.000	.000
PE	.000	.000	.000	.705	.000	.000	.000
BI	.478	.196	.155	.359	-.051	-.048	.000
Planning	.000	.000	.000	.000	.000	.000	1.060
Prediction	.000	.000	.000	.000	.000	.000	1.060
Intention	.000	.000	.000	.000	.000	.000	1.000
KAcq	1.092	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
KAss	1.080	.000	.000	.000	.000	.000	.000
KTrans	1.000	.000	.000	.000	.000	.000	.000
PBC	.000	.919	.000	.000	.000	.000	.000
FC	.000	1.000	.000	.000	.000	.000	.000
GSI	.000	.000	1.615	.000	.000	.000	.000
PSI	.000	.000	1.000	.000	.000	.000	.000
SR	.000	.000	.000	.986	.000	.000	.000
SC	.000	.000	.000	1.023	.000	.000	.000
Freedom	.000	.000	.000	1.000	.000	.000	.000
PEU	.000	.000	.000	.000	.961	.000	.000
EU	.000	.000	.000	.000	1.000	.000	.000
OE	.000	.000	.000	.000	.000	1.117	.000
RA	.000	.000	.000	.000	.000	1.178	.000
PU	.000	.000	.000	.000	.000	1.000	.000

Standardized Direct Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
E_E	.000	.000	.000	.809	.000	.000	.000
P_E	.000	.000	.000	.820	.000	.000	.000
B_I	.687	.279	.168	.543	-.079	-.062	.000
Planning	.000	.000	.000	.000	.000	.000	.822
Prediction	.000	.000	.000	.000	.000	.000	.858
Intention	.000	.000	.000	.000	.000	.000	.791

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
KAcq	.895	.000	.000	.000	.000	.000	.000
KAss	.893	.000	.000	.000	.000	.000	.000
KTrans	.826	.000	.000	.000	.000	.000	.000
PBC	.000	.752	.000	.000	.000	.000	.000
FC	.000	.798	.000	.000	.000	.000	.000
GSI	.000	.000	1.066	.000	.000	.000	.000
PSI	.000	.000	.520	.000	.000	.000	.000
SR	.000	.000	.000	.863	.000	.000	.000
SC	.000	.000	.000	.861	.000	.000	.000
Freedom	.000	.000	.000	.888	.000	.000	.000
PEU	.000	.000	.000	.000	.909	.000	.000
EU	.000	.000	.000	.000	.868	.000	.000
OE	.000	.000	.000	.000	.000	.848	.000
RA	.000	.000	.000	.000	.000	.830	.000
PU	.000	.000	.000	.000	.000	.859	.000

Indirect Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
E_E	.000	.000	.000	.000	.000	.000	.000
P_E	.000	.000	.000	.000	.000	.000	.000
B_I	.000	.000	.000	-.076	.000	.000	.000
Planning	.507	.208	.165	.300	-.054	-.051	.000
Prediction	.507	.208	.165	.300	-.054	-.051	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
Intention	.478	.196	.155	.283	-.051	-.048	.000
KAcq	.000	.000	.000	.000	.000	.000	.000
KAss	.000	.000	.000	.000	.000	.000	.000
KTrans	.000	.000	.000	.000	.000	.000	.000
PBC	.000	.000	.000	.000	.000	.000	.000
FC	.000	.000	.000	.000	.000	.000	.000
GSI	.000	.000	.000	.000	.000	.000	.000
PSI	.000	.000	.000	.000	.000	.000	.000
SR	.000	.000	.000	.000	.000	.000	.000
SC	.000	.000	.000	.000	.000	.000	.000
Freedom	.000	.000	.000	.000	.000	.000	.000
PEU	.000	.000	.000	.789	.000	.000	.000
EU	.000	.000	.000	.821	.000	.000	.000
OE	.000	.000	.000	.787	.000	.000	.000
RA	.000	.000	.000	.831	.000	.000	.000
PU	.000	.000	.000	.705	.000	.000	.000

Standardized Indirect Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
EE	.000	.000	.000	.000	.000	.000	.000
PE	.000	.000	.000	.000	.000	.000	.000
BI	.000	.000	.000	-.115	.000	.000	.000
Planning	.564	.229	.138	.352	-.065	-.051	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
Prediction	.589	.239	.144	.367	-.068	-.054	.000
Intention	.543	.220	.133	.338	-.062	-.049	.000
KAcq	.000	.000	.000	.000	.000	.000	.000
KAss	.000	.000	.000	.000	.000	.000	.000
KTrans	.000	.000	.000	.000	.000	.000	.000
PBC	.000	.000	.000	.000	.000	.000	.000
FC	.000	.000	.000	.000	.000	.000	.000
GSI	.000	.000	.000	.000	.000	.000	.000
PSI	.000	.000	.000	.000	.000	.000	.000
SR	.000	.000	.000	.000	.000	.000	.000
SC	.000	.000	.000	.000	.000	.000	.000
Freedom	.000	.000	.000	.000	.000	.000	.000
PEU	.000	.000	.000	.735	.000	.000	.000
EU	.000	.000	.000	.702	.000	.000	.000
OE	.000	.000	.000	.695	.000	.000	.000
RA	.000	.000	.000	.680	.000	.000	.000
PU	.000	.000	.000	.705	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

APPENDIX H

SEM ANALYSIS FOR PAKISTAN

Notes for Group (Group number 1)

The model is recursive.

Sample size = 513

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

PU

RA

OE

EU

PEU

Freedom

SC

SR

PSI

GSI

FC

PBC

KTrans

KAss

KAcq

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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Intention

Prediction

Planning

Unobserved, endogenous variables

PE

EE

BI

Unobserved, exogenous variables

e1

e2

e3

e4

e5

PA

e6

e7

e8

SI

e9

e10

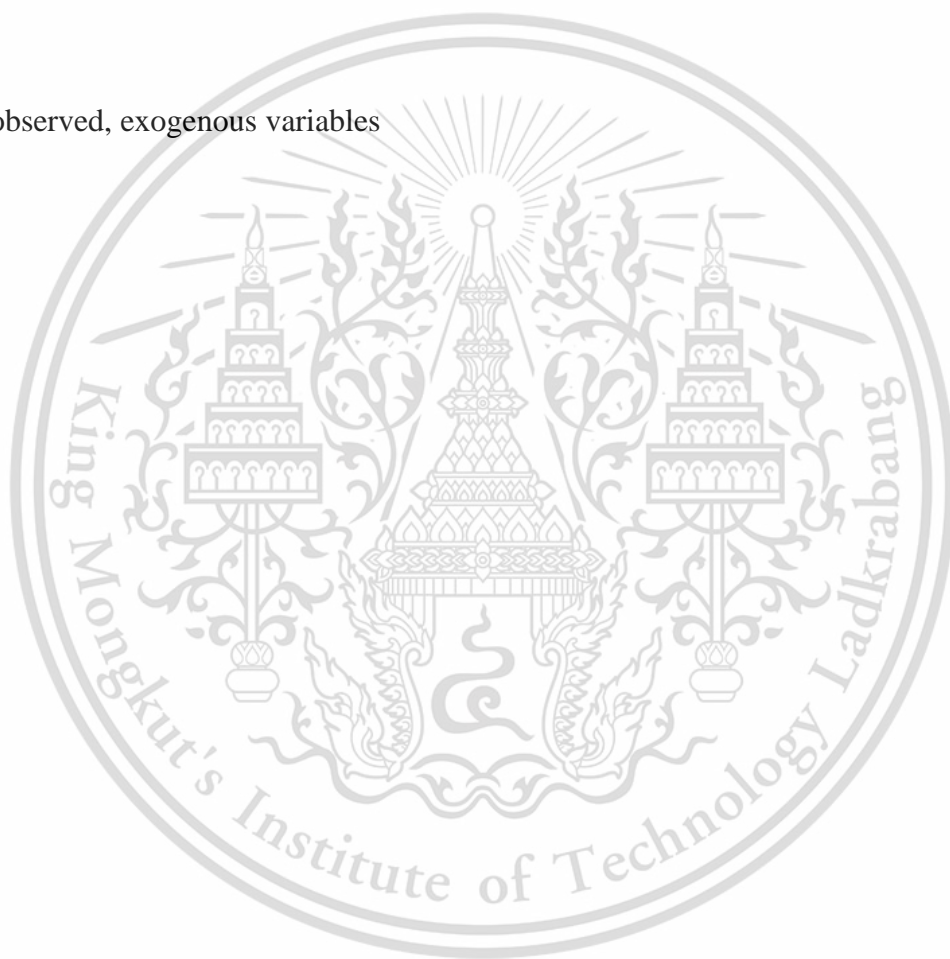
FCS

e11

e12

AC

e13



เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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e14

e15

e16

e17

e18

e20

e21

e19

Variable counts (Group number 1)

Number of variables in your model: 46

Number of observed variables: 18

Number of unobserved variables: 28

Number of exogenous variables: 25

Number of endogenous variables: 21

Parameter Summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	28	0	0	0	0	28
Labeled	0	0	0	0	0	0
Unlabeled	19	0	25	0	0	44
Total	47	0	25	0	0	72

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 171

Number of distinct parameters to be estimated: 44

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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Degrees of freedom (171 - 44): 127

Result (Default model)

Minimum was achieved

Chi-square = 2340.432

Degrees of freedom = 127

Probability level = .000

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

		Estimate	S.E.	C.R.	P	Label
EE	<--- PA	.791	.046	17.021	***	par_17
PE	<--- PA	.780	.045	17.516	***	par_18
BI	<--- AC	.412	.029	14.091	***	par_12
BI	<--- FCS	.117	.031	3.831	***	par_13
BI	<--- SI	.153	.027	5.617	***	par_14
BI	<--- PA	.256	.075	3.403	***	par_15
BI	<--- PE	.022	.045	.496	.620	par_16
BI	<--- EE	.106	.066	1.596	.110	par_19
PU	<--- PE	1.000				
RA	<--- PE	1.136	.050	22.829	***	par_1
OE	<--- PE	1.044	.045	23.076	***	par_2
EU	<--- EE	1.000				

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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			Estimate	S.E.	C.R.	P	Label
PEU	<---	EE	1.018	.055	18.639	***	par_3
Freedom	<---	PA	1.000				
SC	<---	PA	1.075	.041	26.279	***	par_4
SR	<---	PA	1.001	.040	25.040	***	par_5
PSI	<---	SI	1.000				
GSI	<---	SI	.723	.089	8.101	***	par_6
FC	<---	FCS	1.000				
PBC	<---	FCS	2.365	1.043	2.268	.023	par_7
KTrans	<---	AC	1.000				
KAss	<---	AC	1.024	.041	25.109	***	par_8
KAcq	<---	AC	.944	.039	24.022	***	par_9
Intention	<---	BI	1.000				
Prediction	<---	BI	1.069	.048	22.322	***	par_10
Planning	<---	B_I	1.046	.051	20.394	***	par_11

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
E_E	<---	PA	.840
P_E	<---	PA	.775
B_I	<---	AC	.588
B_I	<---	FCS	.104
B_I	<---	SI	.241
B_I	<---	PA	.344

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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		Estimate
B_I	<--- PE	.030
B_I	<--- EE	.134
PU	<--- PE	.862
RA	<--- PE	.837
OE	<--- PE	.843
EU	<--- EE	.797
PEU	<--- EE	.848
Freedom	<--- PA	.857
SC	<--- PA	.888
SR	<--- PA	.862
PSI	<--- SI	.988
GSI	<--- SI	.752
FC	<--- FCS	.548
PBC	<--- FCS	1.219
KTrans	<--- AC	.841
KAss	<--- AC	.902
KAcq	<--- AC	.868
Intention	<--- BI	.797
Prediction	<--- BI	.897
Planning	<--- BI	.824

Variances: (Group number 1 - Default model)

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Estimate	S.E.	C.R.	P	Label
PA	.617	.052	11.860	***	par_20
SI	.843	.113	7.488	***	par_21
FCS	.266	.122	2.176	.030	par_22
AC	.696	.061	11.425	***	par_23
e20	.250	.026	9.589	***	par_24
e19	.161	.024	6.812	***	par_25
e21	.119	.014	8.528	***	par_26
e1	.215	.021	10.473	***	par_27
e2	.346	.030	11.574	***	par_28
e3	.277	.024	11.319	***	par_29
e4	.314	.029	11.002	***	par_30
e5	.222	.026	8.677	***	par_31
e6	.224	.018	12.227	***	par_32
e7	.191	.018	10.882	***	par_33
e8	.213	.018	12.023	***	par_34
e9	.021	.099	.216	.829	par_35
e10	.337	.056	6.054	***	par_36
e11	.619	.122	5.083	***	par_37
e12	-.485	.646	-.751	.453	par_38
e13	.288	.024	12.043	***	par_39
e14	.168	.019	8.835	***	par_40
e15	.202	.019	10.849	***	par_41

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Estimate	S.E.	C.R.	P	Label
e16	.196	.015	12.882	***	par_42
e17	.095	.011	8.687	***	par_43
e18	.176	.014	12.146	***	par_44

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
E_E	.705
P_E	.600
B_I	.652
Planning	.679
Prediction	.804
Intention	.635
KAcq	.754
KAss	.813
KTrans	.707
PBC	1.485
FC	.300
GSI	.566
PSI	.975
SR	.744
SC	.788
Freedom	.734
PEU	.719

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
ไม่ว่ากรณีใดๆ ทั้งสิ้น อีกทั้งห้ามมิให้ดัดแปลงเนื้อหา และต้องอ้างอิงถึงเจ้าของเอกสารทุกครั้งที่มีการนำไปใช้

	Estimate
EU	.636
OE	.711
RA	.700
PU	.744

Matrices (Group number 1 - Default model)

Factor Score Weights (Group number 1 - Default model)

	Plan ning	Pred ictio n	Inte ntio n	KA cq	KA ss	KTr ans	PB C	FC	GSI	PSI	SR	SC	Free dom	PE U	EU	OE	RA	PU
A	.0	.0	.0	.2	.3	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
C	3	73	3	8	6	0	0	0	0	0	0	0	1	0	0	0	0	0
	8	3	1	8	9	4	5	1	2	0	2	0	9	6	2	2	2	3
FC	.0	.0	.0	0	0	0	8	.2	0	0	0	0	.0	0	0	0	0	0
S	2	53	2	1	1	1	0	6	0	1	0	0	0	0	0	0	0	0
	8	4	3	8	0	4	6	1	6	7	9	7	6	4	2	1	2	2
SI	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	.0	.0	.0	.0	.0	.0	.0
	4	08	4	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0
				2	3	2	2	1	3	2	1	1	1	1	1	0	0	0
PA	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.2	.0	.0	.0	.0	.0	.0
	2	39	1	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0
	1	8	1	1	0	0	3	0	1	0	0	6	9	7	5	3	2	4
				0	3	7	8	1	2	0	3	3	2	0	3	9	1	1

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	Plan ning	Pred ictio n	Inte ntio n	KA cq	KA ss	KTr ans	PB C	FC	GSI	PSI	SR	SC	Free dom	PE U	EU	OE	RA	PU
EE	.0 1 8	.0 34	.0 1 6	. 0 9	. 0 2	. 0 7	. 0 7	. 0 2	. 0 0	. 0 0	. 0 1	. 0 4	. 0 7	. 3 4	. 2 4	. 0 1	. 0 1	. 0 1
PE	.0 0 6	.0 11	.0 0 5	. 0 3	. 0 4	. 0 2	. 0 2	. 0 1	. 0 0	. 0 0	. 0 4	. 0 5	. 0 0	. 4 1	. 0 0	. 2 3	. 2 0	. 2 9
BI	.1 9 2	.3 65	.1 6 5	. 0 3	. 0 3	. 0 2	. 0 2	. 0 0	. 0 0	. 0 3	. 0 1	. 0 2	. 0 0	. 0 1	. 0 1	. 0 1	. 0 0	. 0 0

Total Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
EE	.000	.000	.000	.791	.000	.000	.000
PE	.000	.000	.000	.780	.000	.000	.000
BI	.412	.117	.153	.357	.106	.022	.000
Planning	.431	.123	.160	.373	.111	.024	1.046
Prediction	.440	.125	.164	.382	.113	.024	1.069
Intention	.412	.117	.153	.357	.106	.022	1.000
KAcq	.944	.000	.000	.000	.000	.000	.000
KAss	1.024	.000	.000	.000	.000	.000	.000
KTrans	1.000	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
PBC	.000	2.365	.000	.000	.000	.000	.000
FC	.000	1.000	.000	.000	.000	.000	.000
GSI	.000	.000	.723	.000	.000	.000	.000
PSI	.000	.000	1.000	.000	.000	.000	.000
SR	.000	.000	.000	1.001	.000	.000	.000
SC	.000	.000	.000	1.075	.000	.000	.000
Freedom	.000	.000	.000	1.000	.000	.000	.000
PEU	.000	.000	.000	.806	1.018	.000	.000
EU	.000	.000	.000	.791	1.000	.000	.000
OE	.000	.000	.000	.814	.000	1.044	.000
RA	.000	.000	.000	.886	.000	1.136	.000
PU	.000	.000	.000	.780	.000	1.000	.000

Standardized Total Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
EE	.000	.000	.000	.840	.000	.000	.000
PE	.000	.000	.000	.775	.000	.000	.000
BI	.588	.104	.241	.481	.134	.030	.000
Planning	.485	.085	.199	.396	.111	.025	.824
Prediction	.528	.093	.216	.431	.121	.027	.897
Intention	.469	.083	.192	.383	.107	.024	.797
KAcq	.868	.000	.000	.000	.000	.000	.000
KAss	.902	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
KTrans	.841	.000	.000	.000	.000	.000	.000
PBC	.000	1.219	.000	.000	.000	.000	.000
FC	.000	.548	.000	.000	.000	.000	.000
GSI	.000	.000	.752	.000	.000	.000	.000
PSI	.000	.000	.988	.000	.000	.000	.000
SR	.000	.000	.000	.862	.000	.000	.000
SC	.000	.000	.000	.888	.000	.000	.000
Freedom	.000	.000	.000	.857	.000	.000	.000
PEU	.000	.000	.000	.712	.848	.000	.000
EU	.000	.000	.000	.670	.797	.000	.000
OE	.000	.000	.000	.653	.000	.843	.000
RA	.000	.000	.000	.648	.000	.837	.000
PU	.000	.000	.000	.668	.000	.862	.000

Direct Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
E_E	.000	.000	.000	.791	.000	.000	.000
P_E	.000	.000	.000	.780	.000	.000	.000
B_I	.412	.117	.153	.256	.106	.022	.000
Planning	.000	.000	.000	.000	.000	.000	1.046
Prediction	.000	.000	.000	.000	.000	.000	1.069
Intention	.000	.000	.000	.000	.000	.000	1.000
KAcq	.944	.000	.000	.000	.000	.000	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
KAss	1.024	.000	.000	.000	.000	.000	.000
KTrans	1.000	.000	.000	.000	.000	.000	.000
PBC	.000	2.365	.000	.000	.000	.000	.000
FC	.000	1.000	.000	.000	.000	.000	.000
GSI	.000	.000	.723	.000	.000	.000	.000
PSI	.000	.000	1.000	.000	.000	.000	.000
SR	.000	.000	.000	1.001	.000	.000	.000
SC	.000	.000	.000	1.075	.000	.000	.000
Freedom	.000	.000	.000	1.000	.000	.000	.000
PEU	.000	.000	.000	.000	1.018	.000	.000
EU	.000	.000	.000	.000	1.000	.000	.000
OE	.000	.000	.000	.000	.000	1.044	.000
RA	.000	.000	.000	.000	.000	1.136	.000
PU	.000	.000	.000	.000	.000	1.000	.000

Standardized Direct Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
E_E	.000	.000	.000	.840	.000	.000	.000
P_E	.000	.000	.000	.775	.000	.000	.000
B_I	.588	.104	.241	.344	.134	.030	.000
Planning	.000	.000	.000	.000	.000	.000	.824
Prediction	.000	.000	.000	.000	.000	.000	.897
Intention	.000	.000	.000	.000	.000	.000	.797

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
KAcq	.868	.000	.000	.000	.000	.000	.000
KAss	.902	.000	.000	.000	.000	.000	.000
KTrans	.841	.000	.000	.000	.000	.000	.000
PBC	.000	1.219	.000	.000	.000	.000	.000
FC	.000	.548	.000	.000	.000	.000	.000
GSI	.000	.000	.752	.000	.000	.000	.000
PSI	.000	.000	.988	.000	.000	.000	.000
SR	.000	.000	.000	.862	.000	.000	.000
SC	.000	.000	.000	.888	.000	.000	.000
Freedom	.000	.000	.000	.857	.000	.000	.000
PEU	.000	.000	.000	.000	.848	.000	.000
EU	.000	.000	.000	.000	.797	.000	.000
OE	.000	.000	.000	.000	.000	.843	.000
RA	.000	.000	.000	.000	.000	.837	.000
PU	.000	.000	.000	.000	.000	.862	.000

Indirect Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
E_E	.000	.000	.000	.000	.000	.000	.000
P_E	.000	.000	.000	.000	.000	.000	.000
B_I	.000	.000	.000	.101	.000	.000	.000
Planning	.431	.123	.160	.373	.111	.024	.000
Prediction	.440	.125	.164	.382	.113	.024	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
Intention	.412	.117	.153	.357	.106	.022	.000
KAcq	.000	.000	.000	.000	.000	.000	.000
KAss	.000	.000	.000	.000	.000	.000	.000
KTrans	.000	.000	.000	.000	.000	.000	.000
PBC	.000	.000	.000	.000	.000	.000	.000
FC	.000	.000	.000	.000	.000	.000	.000
GSI	.000	.000	.000	.000	.000	.000	.000
PSI	.000	.000	.000	.000	.000	.000	.000
SR	.000	.000	.000	.000	.000	.000	.000
SC	.000	.000	.000	.000	.000	.000	.000
Freedom	.000	.000	.000	.000	.000	.000	.000
PEU	.000	.000	.000	.806	.000	.000	.000
EU	.000	.000	.000	.791	.000	.000	.000
OE	.000	.000	.000	.814	.000	.000	.000
RA	.000	.000	.000	.886	.000	.000	.000
PU	.000	.000	.000	.780	.000	.000	.000

Standardized Indirect Effects (Group number 1 - Default model)

	AC	FCS	SI	PA	EE	PE	BI
E_E	.000	.000	.000	.000	.000	.000	.000
P_E	.000	.000	.000	.000	.000	.000	.000
B_I	.000	.000	.000	.137	.000	.000	.000
Planning	.485	.085	.199	.396	.111	.025	.000

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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	AC	FCS	SI	PA	EE	PE	BI
Prediction	.528	.093	.216	.431	.121	.027	.000
Intention	.469	.083	.192	.383	.107	.024	.000
KAcq	.000	.000	.000	.000	.000	.000	.000
KAss	.000	.000	.000	.000	.000	.000	.000
KTrans	.000	.000	.000	.000	.000	.000	.000
PBC	.000	.000	.000	.000	.000	.000	.000
FC	.000	.000	.000	.000	.000	.000	.000
GSI	.000	.000	.000	.000	.000	.000	.000
PSI	.000	.000	.000	.000	.000	.000	.000
SR	.000	.000	.000	.000	.000	.000	.000
SC	.000	.000	.000	.000	.000	.000	.000
Freedom	.000	.000	.000	.000	.000	.000	.000
PEU	.000	.000	.000	.712	.000	.000	.000
EU	.000	.000	.000	.670	.000	.000	.000
OE	.000	.000	.000	.653	.000	.000	.000
RA	.000	.000	.000	.648	.000	.000	.000
PU	.000	.000	.000	.668	.000	.000	.000

Model Fit Summary

CMIN

Model	NPARCMIN	DF	P	CMIN/DF	
Default model	50	580.178	121	.000	4.795

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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Model	NPAR	CMIN	DF	P	CMIN/DF
Saturated model	171	.000	0		
Independence model	18	8882.377	153	.000	58.055

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.043	.860	.803	.609
Saturated model	.000	1.000		
Independence model	.527	.129	.027	.116

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.923	.903	.936	.919	.936
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.791	.730	.740
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	559.178	481.000	644.860
Saturated model	.000	.000	.000
Independence model	8729.377	8423.838	9041.230

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.328	1.092	.939	1.259
Saturated model	.000	.000	.000	.000
Independence model	17.348	17.050	16.453	17.659

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.075	.088	.102	.000
Independence model	.334	.328	.340	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	780.178	784.032	992.192	1042.192
Saturated model	342.000	355.181	1067.087	1238.087
Independence model	8918.377	8919.765	8994.702	9012.702

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.524	1.371	1.691	1.531
Saturated model	.668	.668	.668	.694
Independence model	17.419	16.822	18.028	17.421

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	112	121
Independence model	11	12

เอกสารนี้เป็นเอกสารที่สงวนไว้สำหรับการใช้งานเพื่อการศึกษาเท่านั้น ไม่อนุญาตให้นำไปใช้ประโยชน์ด้านการค้า
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