Causal Relationship Model of the Information and Communication Technology Skill Affect the Technology Acceptance Process in the 21st Century for Undergraduate Students

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Abstract—The objective of this study is to design a framework for a causal relationship model of the Information and Communication Technology skills that affect the Technology Acceptance Process (TAP) for undergraduate students in the 21st Century. This research uses correlational analysis. A consideration of the research methodology is divided into two sections. The first section involves a synthesis concept framework for process acceptance of the causal relationship model of the Information and Communication Technology skills that affect the Technology Acceptance Process for undergraduate students in the 21st Century. The second section proposes the design concept framework of the model. The research findings are as follows:

1) The exogenous latent variables included in the causal relationship model of the Information and Communication Technology skills that affect the Technology Acceptance Process for undergraduate students in the 21st Century are basic ICT skills and self-efficacy.

2) The mediating latent variables of the causal relationship model of the Information and Communication Technology skills that affect the Technology Acceptance Process for undergraduate students in the 21st Century are from the TAM Model, these includes three components: 1) perceived usefulness, 2) perceived ease of use and 3) attitudes.

3) The outcome latent variable of the causal relationship model of the Information and Communication Technology skills that affect the Technology Acceptance Process for undergraduate students in the 21st Century is behavioural intention.

Index Terms—Causal Relationship Model, Technology Acceptance Process, Basic ICT skills, Self-Efficacy.

I. INTRODUCTION

Thailand has implemented ICT Policy Framework (B.E. 2554-2563, ICT 2020) which aims to enhance the economy and quality of life of the Thai people and lead Thailand towards a knowledge-based economy and society. By this respect, information and communication technology can be used to promote learning in order to drive education and encourage "wise learning". This is related to the way in which we ought to manage education according to National Education Act of B.E. 2542 (1999) Chapter 9, which concerns the role of technology within education. It states that learners have the right to develop their technology-utilizing abilities for educational purposes. They need to have sufficient knowledge and skill in using these technologies in order to acquire knowledge for themselves on a continuous lifelong basis. Thus, the Thai government has to introduce a high-speed efficient ICT infrastructure across the whole country as part of a high-speed internet connection service to provide a broadband network that connects teachers and students. This can satisfy teaching requirements everywhere and at all times.

Accordingly, higher education institutions in Thailand have to plan the strategy for teaching patterns in the 21st century. They need to prepare their institutions for educational resource management and technological strategic development by using technology and communication devices for the efficient improvement of lecturers and students.

Computing and ICT Literacy involves accessing, managing, integrating, evaluating, creating and communicating. Such literacy will become one of the most significant literacy changes of the 21st century. It also supports the use of technology and communication devices. Moreover, this literacy development will also help students when it comes to self-study. [15]

Self-efficacy beliefs should not be completely separated from outcome expectations which are the people’s judgments of the consequences that will be produced by their behaviour. Regularly, the expected outcome is supported by self-efficacy beliefs [17]. High self-efficacy learners take part in more effective self-regulatory strategies at the different levels of ability. Conclusively, self-efficacy enhances learners’ performance.

According to previous information that has been obtained, the researcher is interested in developing a causal relationship model of the Information and Communication Technology skills that affect the Technology Acceptance Process for undergraduate students in the 21st Century. This paper is divided into two sections: The first section contains a synthesis of the framework of the causal relationship model of the technology acceptance process of learning innovation for undergraduate students in the 21st Century. The second section proposes the design for the model.
II. RESEARCH OBJECTIVES

1. To synthesize the concept of the framework of causal relationship model of the Information and Communication Technology skill affect the Technology Acceptance Process in the 21st Century for undergraduate students.


III. RESEARCH QUESTION

What is causal relationship model of the Information and Communication Technology skill affect Technology Acceptance Process in the 21st Century for undergraduate students?

IV. LITERATURE REVIEW

A. Technology Accept Model (TAM)

TAM is one of the most well-known and commonly used model with regard to ICT acceptance. TAM is also a fundamental theory that many experimental studies have related to technology use. TAM proposes a distinction between perceived usefulness, perceived ease of use [18], attitude, and behavioural intention.

B. Perceived Usefulness (PU)

Perceived usefulness is an important factor in Technology acceptance model which affects on attitude, behavioral intention. [19], [20]. An advantage derived from the attributes of technology that are being used is the perceived usefulness. This can be physiological, psychological, sociological or material in the nature [26]. The extent to which this utilitarian value of social media is perceived to be beneficial determines the perceived usefulness.

C. Perceived Ease of Use (PEU)

Perceived ease of use is one of the elements in the technology acceptance model [21]. It affects directly to perceived usefulness, attitude and behavioural intention using the technology as an essential element.

D. Attitude (AT)

Attitude is a factor in technology acceptance model. It has two parts: attitude towards the object and attitude towards the behavior [24]. It influenced directly to behavioral intention and attitude is the association between usefulness and ease of use of a model.

E. Behavioral Intention (BI)

A personally expected or intended future behaviour is explained in the model by the individual’s behaviour in terms of his intention to use [19]. The expectancies that a person has concerning a particular behaviour in a specific situation. Moreover, if the intention can be calculated precisely, behaviour can also be forecast [24] with regard to using technology.

F. Self-Efficacy (S-E)

A key determinant of the degree of effort or perseverance is the self-efficacy that a person demonstrates with regard to investing in performing behaviour [22]. It also has its origins in the degree of ICT self-efficacy [23]. ICT self-efficacy is an element of self-efficacy which has been characterized as an individual’s human perception when it comes to using ICT [24].

G. Basic ICT Skill (BICs)

 Nowadays, information technology is an important factor in terms of improving the skills of university students. Thus, these institutions have to create a strategy relating to learning that is continuously changing. The institutions also need to consider the competencies of the students, especially information technology skills that are in accordance with the concept of ICT digital literacy. These are as followings: 1. Access 2. Manage 3. Integrate 4. Evaluate 5. Create and 6. Communicate [15] in order to function in a knowledgeable society (see Table 1).

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<th>Basic Elements of Digital Literacy</th>
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**SHORT PAPER**

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The second stage proposes the design of the causal relationship model of the Information and Communication Technology skills that affect the Technology Acceptance Process for undergraduate students in the 21ST Century. The result of this research is invaluable as this model would not only facilitate the management of the university’s administrators, but it would also help promote teaching and learning.

VIII. CONCLUSION

The causal relationship model of the information and communication technology skills that affect the Technology Acceptance Process for undergraduate students in the 21ST century includes perceived usefulness, perceived ease of use, attitude, and behavioural intentions. These factors show the affects of the degree of end users’ technology acceptance. The other two factors, self-efficacy and basic ICT skills are also important as they are considered the essential ICT skills for university in the 21ST century. The result of this research is invaluable as this model would not only facilitate the management of the university’s administrators, but it would also help promote teaching and learning.

**REFERENCES**

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VII. RESEARCH METHODOLOGY

The first stage is the synthesis of the framework of causal relationship model of the information and Communication Technology skills that affect the Technology Acceptance Process for undergraduate students in the 21ST Century.

VI. RESEARCH HYPOTHESE

This study employed correlational research to developing twelve hypotheses and then tests the relationships between variables.

H1 Basic ICT Skill has a positive effect on perceived usefulness.
H2 Basic ICT Skill has a positive effect on perceived ease of use.
H3 Basic ICT Skill has a positive effect on perceived ease of use.
H4 Self-efficacy has a positive effect on perceived usefulness.
H5 Self-efficacy has a positive effect on perceived ease of use.
H6 Self-efficacy has a positive effect on perceived behavioural intention.
H7 Perceived Ease of Use has a positive effect on perceived usefulness.
H8 Perceived Ease of Use has a positive effect on attitude.
H9 Perceived Ease of Use has a positive effect on behavioural intention.
H10 Perceived usefulness has a positive effect on attitude.
H11 Perceived usefulness has a positive effect on behavioural intention.
H12 Attitude has a positive effect on behavioural intention

V. VARIABLE

Research variables considered in this study are:
1. Exogenous latent variables: basic ICT skills and self-efficacy;
2. Endogenous variables:
   a. Mediating latent variables: perceived ease of use, perceived usefulness and attitude.
   b. Outcome latent variables: behavioral intentions

![Figure 1. The research model](http://www.i-jet.org)
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