Measuring Tools for Analyzing Factors Influencing Users' Continuance Intention Toward a Learning Platform in Bandung Indonesia

Desfiana Elva Larissa[1], Indrawati[2]

[1, 2] Telkom University, School of Business and Economics, Bandung, Indonesia

Abstract: *The increasing of internet users over the years encourages government of Bandung city to initiate Smart City since 2014, as a concept of utilizing information and communication technology (ICT) on a variety of smart city dimentions effectively. Smart Education, as a dimention of Smart City concept has been seen to be a good prospect in Asia especially in Indonesia, the market outlook of it will reach over USD 600 million by 2018. One of the most popular learning platforms in Indonesia is Edmodo. Edmodo was introduced in Bandung Indonesia by the government on their program called Digital Smart Jabar. Compared with local players, Edmodo has succeeded to gain at least 10 M downloaders on Play Store. This study proposes a measurement tool that can be used to find out factors that influence the customers in adopting Edmodo. The measurement tool was adapted from the Theory of Acceptance and Use of Technology 2 Model by Venkatesh et al. (2012). The modification of models has been done by adding Trust variable and changing Price Value variable with Learning Value. The variables in the proposed model has been tested through pilot test of 30 respondents, the result revealed that the 9 variables with 45 items are reliable and valid, hence the measurement tool can be used for further study, collecting main data.*

Keywords: Smart City, Smart Education, Edmodo, continuance intention, Modified UTAUT 2

1. Introduction

The internet user penetration in Bandung, Indonesia has increased through the years in line with the growth of its population. Bandung ranks number 4 in the list of cities by the internet users with 579,000 total users [1]. It encouraged the government to initiate Smart City in Bandung since 2014 to utilize information and communication technology (ICT) in managing resources effectively.

Smart City is the way how the government cope with the demands of urbanization [2] with a purpose to improve the life quality of citizen. The data shows that 70% problems in Bandung has been resolved by the Smart City concept which apply technology and information in serving the citizens [3]. This concept includes Smart Government, Smart Education, Smart Transportation, Smart Health, Smart Energy, Smart Surveillance, Smart Environment, Smart Society, Smart Payment and Smart Commerce. Nevertheless, Smart Education has covered the biggest market segment from 2012-2019, it makes up to 25% Smart City market includes e-learning for schools, universities, enterprises and government entities [4]. Moreover, according to Ken Research's report, the market outlook of Indonesia Digital Education and E-learning will reach over USD 600 million by 2018 due to the high demand on the adoption of technology in classrooms [5]. The Indonesian Ministry of Education and Culture further explained that technology initiative will help 3 million teachers in Indonesia who need to educate more than 50 million students in schools [6].
In the following years after the Smart City initiation, the Bandung's government introduced a Digital Smart School Jabar in order to catch up with the technology development. Afterwards, the government has used Edmodo as the learning platform applied in West Java and chose Bandung as the host of the network.

Edmodo is a learning platform from U.S that has grown to be the largest learning network in the world with more than 75 million users worldwide by 2017 [7]. Edmodo has several features such as groups, communication streams, assignment and quiz pages, planner, teacher and student libraries, profile page and badges able to support the classroom activities. This learning platform has been used for conducting the test in 120 schools [8]. Compared with other popular learning platforms in Indonesia, Edmodo has led the market while beating local players such as Ruang Guru and Kelase.

It showed that Edmodo plays an important role in Smart Education program which needs a further study in maintaining its existing users. Analyzing the factors that influence users' continuance intention provides Edmodo a picture of their valuable users' perspectives. It helps Edmodo to improve their service quality and gain a higher position in Indonesian market.

The Unified Theory of Acceptance and Use of Technology (UTAUT) 2 Model of Venkatesh et al. (2012) [9] was adapted in this study with some modifications to analyze factors that influence the continuance intention of Edmodo adoption in Bandung, Indonesia. The objective of this research is to test the measurement tools that further can be used to test the proposed model.

2. Literature Review

Unified Theory of Acceptance and Use of Technology (UTAUT) 2 Model
The authors conducted literature review of previous studies, models and theories that related to the adoption of technology-based service to achieve the objective. As a result, the authors decided to use UTAUT 2 Model as a baseline framework in this study. Since UTAUT 2 Model

was found out to be latest theory in technology acceptance that completed its eight previous theories, such as Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Motivational Model (MM), Combined TAM-TPB (C-TAM-TPB), Model of Personal Computer Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT) [10]. Meanwhile, the previous UTAUT Model focus on the organizational context rather than the consumer context. Therefore, UTAUT 2 Model is suitable with this study which has students as the users of Edmodo. Furthermore, UTAUT 2 Model has been proven to have an improvement in the variance explain in the Behavioral Intention, which increased 56 percent to 74 percent compared with UTAUT, in line with the Use Behavior from 40 percent to 52 percent which allowed the authors to overcome the limitation in UTAUT Model [9]. Lastly, some studies in educational context has used UTAUT 2 Model., such as Yakubu et al (2018) who studied about the adoption of e-learning technologies among higher education students in Nigeria [10], Nguyen et al. (2016) researched about the acceptance and use of e-learning based in cloud computing in Vietnam [11], and Masri and Tarhini (2017) which extended UTAUT 2 in studying the factors that affect the e-learning adoption in Qatar and USA [12].

To fulfill the need of the study, the UTAUT 2 Model was modified. Firstly, the Behavioral Intention was adapted to be Continuance Intention to analyze the factors that influence senior high school students in Bandung to use Edmodo continuously which means the respondent of this study are the existing users who have used Edmodo at least three months. Hence, the Use behavior was excluded since the study wants to find out the decision of users' continuity. This adaptation was supported by the study of Xu (2014) about the users' continued use of online games that use UTAUT 2 Model [13].

Moreover, there was a modification of independent variable that was done in this research which replaced Price Value (PV) variable by Learning Value (LV) variable considering the students' perspective which gain learning from Edmodo rather than consumers' point of view which see the value from products or services if only it offers benefits. This proposed variable was corroborated with literature review that was done by the authors. This variable has been tested as the replacement of Price Value in Ain et al. (2015) study about The Influence of Learning Value on Learning Management System Use: An extension of UTAUT 2 and in the latest study of Sharif et al. (2018) titled Acceptance of Learning Management System in University Students: An Integrating Framework of Modified UTAUT 2 and TIF Theories. In order to fulfill the gap of the research, this study also added Trust variable on the framework. This variable has been tested on some researches as the extended variable in UTAUT 2 as it influences the adoption of technology, such as in the study of Factors Affecting the Adoption of E-learning Systems in Qatar and USA: Extending the Unified Theory of Acceptance and Use of Technology 2 by Masri and Tarhini (2017). The research shows that Trust became the important factor in the study of e-learning adoption [13]. Then, it also corroborated with Alalwan et al. (2017) study

about Factors Influencing Adoption of Mobile Banking by Jordanian Bank Customers, which proven that Trust has become the important variable to be considered in adopting technology, like mobile banking as cited on the study [14].

The UTAUT 2 Model also has three moderating variables include Age, Gender and Experience. This study excluded Age as the study's respondents described to be equally young based on United Nations (UN), the young age category is represented by age 15- 24 years. This is also in line with the Indonesian government law of education which limit the oldest students in higher education to be 21 years old. Additionally, Experience was not included since the data of the research was only gathered once which meant to be a cross-sectional study. Thus, this UTAUT 2 Model modification consists of 8 independent variables with 1 dependent variable and 1 moderating variables. The proposed model is shown in Figure 1 below.
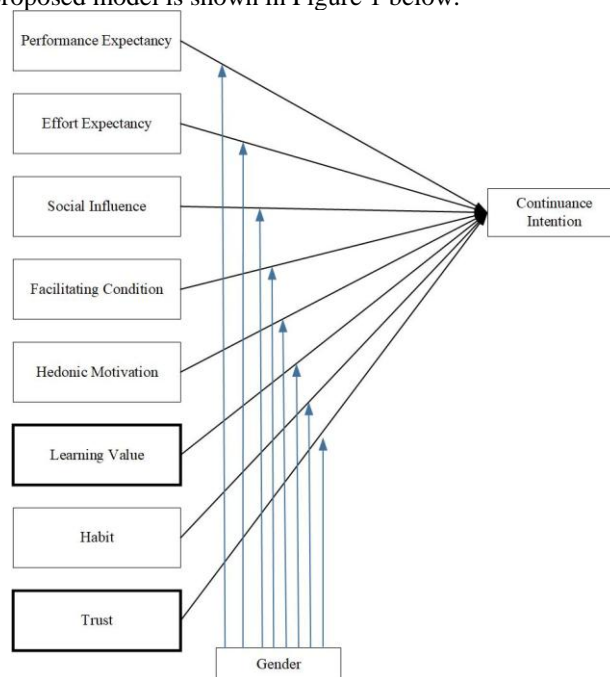

Figure 1: The Research Framework that adapted and modified from UTAUT 2 (Venkatesh et al., 2012) Each variable was adapted and defined based on Venkatesh et al., (2012) [9].

Performance Expectancy is defined as the as the degree of individuals believe that Edmodo might provide benefits in performing some activities. In numerous researches, performance expectancy has been proven to have significant positive impact to behavioral intention, such as Venkatesh et al. (2003) that showed performance expectancy is the strongest predictor of behavioral intention, Indrawati and Yuliansyah (2017), and lastly the research of Alalwan et al (2017). Then, Effort Expectancy is the degree of ease associated with the use of Edmodo. Social Influence is the extent to which students perceive that their families, friends, teachers and schools believe that the use of Edmodo is important. Next, Facilitating Condition described as the degree to which students believe that an organizational and technical infrastructure exists to support the use of Edmodo. Hedonic Motivation is defined as the degree of pleasure derived from using Edmodo including Edmodo features. Meanwhile, Learning Value is students' cognitive tradeoff between the perceived benefits of Edmodo and the time and

effort for using them [15]. Habit is described as the sequences of acts to which people tend to use Edmodo and this research defined Trust to measure the students' belief in ability, benevolence, and integrity in a situation characterized by interdependence and risk. Lastly, Continuance Intention is the degree to which a student has formulated conscious plans to perform some specified future behavior continuously [9].

3. Measurement Material

A valid and reliable measurement material is needed in the study. Therefore, the authors performed some steps to support the measurement material. Firstly, content validity as the first step ensures the questionnaire has enough items that represent the variable itself [16]. The modifications and adaptations of variables were made based on based on both accredited national and international journals such as Venkatesh et al. (2012) [9], Ain et al. (2015) [15], Farooq et al. (2017) [17], Indrawati (2017) [18], Nguyen et al. (2016) [19], Martin and Herero (2012) [20] and Alalwan et al. (2017 [14]. It makes sure that all of the items able to measure the level of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, Hedonic Motivation, Learning Value, Habit, Trust, and Continuance Intention from the respondents of Edmodo users in High Schools of Bandung. The authors also done the marketing and digital technology experts validation to have some improvements on the content of the questionnaire. Lastly, the authors conducted readability test with the respondents to make sure there is no confusion in filling out the questionnaire. Table 1 shows the items of each variable of the proposed model.

Table 1: Questionnaire Items

Item Code	Items of Performance Expectancy
PE1	Edmodo is useful in my study.
PE2	Edmodo allows me to accomplish class activities more quickly.
PE3	Edmodo encourages me to learn more.
PE4	Edmodo increases my chances of getting a better score.
PE5	Edmodo helps me to accomplish my study easily.
Item Code	Items of Effort Expectancy
EE1	Edmodo is easy to use.
EE2	Learning how to use Edmodo is easy for me.
EE3	Edmodo is easy to understand.
EE4	It is easy for me to become skillful at using Edmodo.
EE5	It does not take a long time for me to learn to use Edmodo.
Item Code	Items of Social Influence
SI1	My peers who influence my behavior think that I should use Edmodo.
SI2	My friends who are important to me think that I should use Edmodo.
SI3	My teachers whose opinions that I value prefer that I should use Edmodo.
SI4	People who are close to me are using Edmodo.
SI5	People whose opinions that I appreciate recommend me to use Edmodo.
Item Code	Items of Facilitating Condition
FC1	I have resources to use Edmodo.
FC2	I have knowledge to use Edmodo.
FC3	Edmodo is compatible with my devices.
FC4	Customer service is available to assist me when difficulties arise with Edmodo.
FC5	I feel comfortable using Edmodo.
Item Code	Items of Hedonic Motivation
HM1	Using Edmodo is very interesting for me
HM2	Using Edmodo is an exciting way to learn for me.
HM3	Edmodo motivates me to learn at my own pace in an enjoyable way.
HM4	Communication streaming feature in Edmodo entertains me.
HM5	Using Edmodo makes me satisfied.
Item Code	Items of Learning Value
LV1	Learning through Edmodo is worth more than the time given to it.
LV2	Learning through Edmodo is worth more than the effort given to it.
LV3	In a short time, Edmodo allows me to easily share my knowledge with my classmates.
LV4	Edmodo gives me the opportunity to decide about the pace of my own learning
LV5	Edmodo gives me the opportunity to increase my knowledge.
Items Code	Items of Habit
H1	The use of Edmodo has become a habit for me.
H2	I often use study materials from Edmodo.
H3	Using Edmodo is a part of my daily routine.
H4	I rely on Edmodo to accomplish my task.
H5	Using Edmodo is something that I do without thinking.
Item Code	Items of Trust
TR1	I believe that Edmodo is trustworthy.
TR2	I trust Edmodo.
TR3	I do not doubt the honesty of Edmodo.
TR4	Even if not monitored, I would trust Edmodo to do the job right.
TR5	Edmodo is reliable.
Item Code	Items of Continuance Intention
CI1	I intend to continue using Edmodo.
CI2	I will continue to use Edmodo on a regular basis.
CI3	My intention is to continue using Edmodo than use any alternative learning platform.
CI4	I will strongly recommend others to use Edmodo.
CI5	I plan to continue to use Edmodo frequently.

4. Method and Result

Pilot study was done to ensure the validity constructs was supported by the questionnaire items. The pilot test has 30 respondents and collected data was processed by IBM SPSS 25 software. The authors checked the validity based on the corrected item total correlation (CITC). As cited in Indrawati (2015:149) [21], the CITC value is seen to be valid when it has the correlation coefficient >0.30. As a result, all the tests item is valid. Furthermore, the reliability was checked by Cronbach-Alpha value. According to Indrawati (2015:155) the Cronbach-Alpha value can be stated to be reliable if it has

value >0.70 [21]. The result of pilot test is presented in Table 2.

Table 2: Pilot Test Result

Item Code	CITC	CA	Item Code	CITC	CA
PE1	0.731		LV1	0.689	
PE2	0.437		LV2	0.696	
PE3	0.680	0.847	LV3	0.692	0.890
PE4	0.675		LV4	0.827	
PE5	0.760		LV5	0.786	
EE1	0.534		H1	0.890	
EE2	0.653		H2	0.879	
EE3	0.659	0.841	H3	0.834	0.959
EE4	0.693		H4	0.906	
EE5	0.705		H5	0.914	
SI1	0.844		TR1	0.834	
SI2	0.846		TR2	0.714	
SI3	0.441	0.895	TR3	0.804	0.913
SI4	0.831		TR4	0.824	
SI5	0.764		TR5	0.740	
FC1	0.435		CI1	0.859	
FC2	0.694		CI2	0.865	
FC3	0.614	0.775	CI3	0.789	0.930
FC4	0.499		CI4	0.661	
FC5	0.524		CI5	0.919	
HM1	0.500				
HM2	0.797				
HM3	0.738	0.852			
HM4	0.564				
HM5	0.773				

In the pilot test result, it was found that all of the 45 items in the 9 variables of the measurement model are valid and reliable.

5. Conclusion

To sum up, the pilot test which has been done with 30 respondents who use Edmodo for at least 3 months revealed that the measurement materials of 9 variables with 45 items proposed are valid and reliable. Hence, this proposed measurement material is ready to be used in further study.

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Authors Profile

Desfiana Elva Larissa, Telkom University, School of Business and Economics, Bandung, Indonesia

Indrawati, Telkom University, School of Business and Economics, Bandung, Indonesia