Developing a Measurement Tool to Investigate Students' Continuance Intention in Using Mobile Learning Application

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Abstract: *Educational Technology (EdTech) is the use of technology to support educational activities which are usually delivered through various contents and features. In Indonesia, the emerging EdTech are startups that convey such educational contents through their platforms to tackle the lack of quality education faced by the nation. Since it is a relatively new field, there is the need to understand students' intention to continuously adopt the technology. Hence to fill the gap, this research intends to develop a comprehensive measurement tool to investigate factors that influence such intention. The Unified Theory of Acceptance and Use of Technology 2 by Venkatesh et al. (2012) is seen as the appropriate baseline model for this research. However, a modification was made by proposing content as an added construct and replaced behavioral intention with continuance intention. The pilot test was conducted on 30 respondents to see the validity and reliability of the model. Results show that 9 constructs and 41 items satisfy the test. Therefore, the measurement tool is qualified and acceptable for further study.*

Keywords: Educational technology, technology adoption, continuance intention, modified UTAUT2

1. Introduction

A study by Lowly Institute stated that an inadequate teacher is one of the factors that influence the poor quality of education in Indonesia where only a few can comprehend basic knowledge [1]. This situation leads to the increase in demand for extra classes after school which usually takes forms as private institutions. The emergence of startups in the country is high where it includes the birth of educational startups to help tackle the lack of quality education. Such startups convey educational materials through their application where they are delivered by qualified tutors. With online learning becoming a new way to study, educational technology will most likely to grow.

As of now, there has not been a study done to investigate factors that influence continuance intention of students to continuously adopt mobile learning application. Hence, this research is aimed to fill that gap. This measurement model is expected to be a comprehensive tool that can be used for further study to understand consumer behaviour in adopting educational technology in Indonesia. Furthermore, the insights would be highly beneficial to both edtech companies and the government.

The Unified Theory of Acceptance and Use of Technology 2 proposed by Venkatesh et al. (2012) [2] is thought to be the most appropriate baseline model for this research. Its high exploratory power and consumer context orientation is believed to help understand the objective of this study. In order to understand the context more comprehensively, the original model was modified. Instead of investigating behaviour intention, this research looks into continuance intention. An additional construct of content was added as it is seen as an important aspect in a digital application. The

results are expected to find a comprehensive measurement tool for further investigation.

2. Literature Review

As the underlying theory of this research, UTAUT2 was developed and proposed by Viswanath Venkatesh, James Y.L. Thong and Xin Xu in 2012 [2]. The study was conducted to explore the behavioural intention and use behaviour of mobile internet technology. Independent variables used in Venkatesh et al. (2012) include performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating condition (FC), hedonic motivation (HM), price value (PV), and habit (HT). Behavioural intention (BI) act as the intervening variable with Use behaviour (UB) as the dependent variable [2]. Moreover, "*compared to UTAUT, the extensions proposed in UTAUT2 produced a substantial improvement in the variance explained*" [2]. Since this research is modifying the independent variable into continuance intention, it refers to a study conducted by Xu (2014) who investigated users' intention to keep using online games [3]. Online gaming is a relatively new technology as it transforms the way gaming works, just like how learning platform is shifting the way of education. Results show that social influence, habit, fantasy, enjoyment, achievement and price value influence users' continuance intention in the order of its influence. Chiu and Wang (2008) had previously investigated the factors that influence continuance intention through the implication of the first UTAUT and looked into web-based learning [4]. Results indicated that performance expectancy, effort expectancy, computer self-efficacy, attainment value, utility value and intrinsic value are significant predictors in continuance intention.

The research framework of this study modifies the UTAUT2 model by adding an additional construct namely content,

hence totaling 9 constructs. The independent variable is continuance intention with no intervening variable. At last, there are three moderating variables namely school level, gender and subscribership.

Content is a relevant factor that can influence such intention to use mobile learning application. Digital platforms rely heavily on contents to attract and engage users. In a preliminary data gathering conducted on 30 respondents, 100% agreed that content influence their intention to continue using ABC edtech. It is "*the creative material created by professionals to be used by a large number of people and distributed through technology.*" (Indrawati 2012, 2014) in Indrawati et al (2017) [5]. Previous studies including Indrawati (2014) [6] and Indrawati and Utama (2018) [7] discovered the construct to be influential towards the use of website and 4G adoption respectively.

In a consumer context where users have been using ABC edtech for at least 3 months, continuance intention is a rather appropriate dependent variable to be studied. Referring to Xu (2014) [3], no intervening variable is incorporated. Finally, three moderators are to be investigated. The original moderator of age is adapted to school level to better fit ABC edtech's type of users studied, gender is kept, and adding subscribership to comprehensively match the context. The addition of school level and subscribership may add new value and resolve the issue where little investigation had been made. Finally, experience is eliminated since the data collection process is cross sectional. Figure 1 is the proposed modified UTAUT2 of this study.
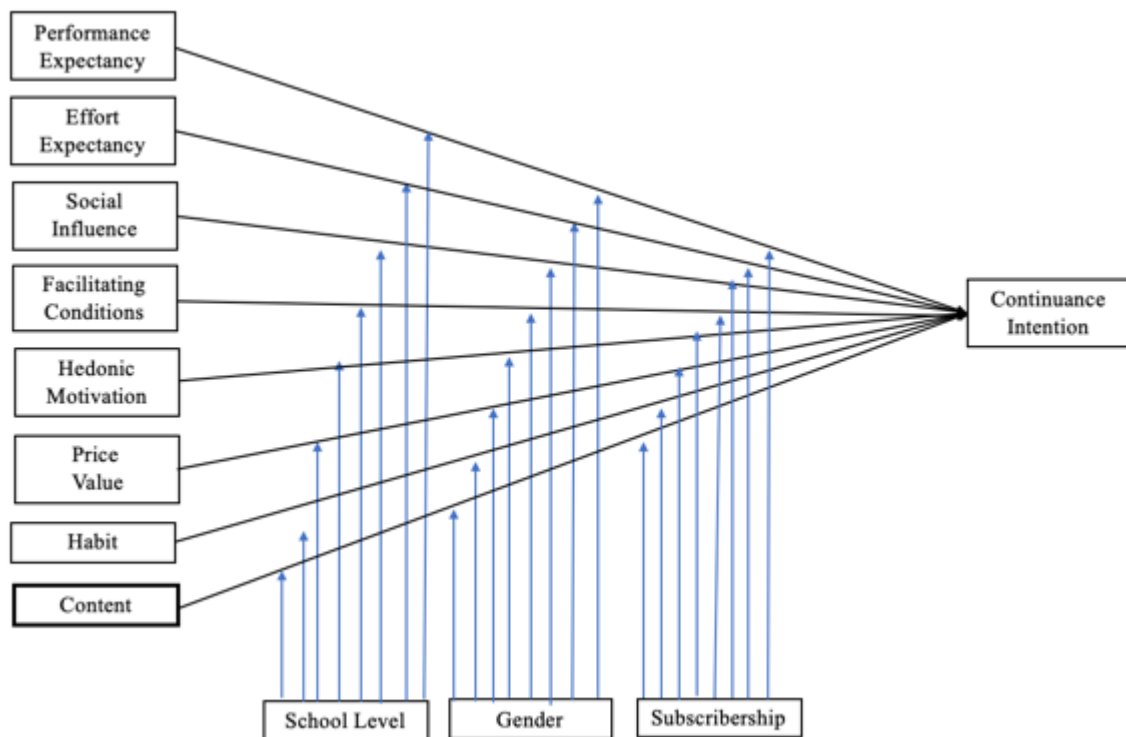
Figure 1: Modified UTAUT2 Model as the research framework

`In total, there are 9 constructs used in this research. Definitions of each variable are as follow:

Performance expectancy refers to the degree in which a person believes that using ABC edtech would provide benefits in their learning activities. Effort expectancy is the degree of ease associated when using ABC edtech. Social influence refers to the extent in which members of social networks, such as family, friends, and familiar people influence one's behaviour to continue using ABC edtech. Facilitating condition is the degree to which one believes on the resources and supports available to help perform the use of ABC edtech. Hedonic motivation refers to the degree of fun or pleasure derived from using ABC edtech. Price value refers to an individual's believe on the perceived benefits ABC edtech delivers in exchange for the monetary cost they pay and Habit is the extent to which an individual makes it a habit or an automate behaviour to use ABC edtech for their

learning activities. At last, content is referred as the educational materials created by ABC edtech delivered through its mobile application.

3. Methodology

Validity and reliability testing are crucial and critical steps to take in order to develop a good measurement tool to generate good data. Validity testing includes content validity, face validity, readability and pilot test. Content validity was conducted by a thorough review and examination on previous literatures and journals [2, 3, 4, 5, 6, 7] published in accredited and internationally acclaimed publishers. Items from previous journals are adopted then modified to fit the context of this research. Face validity refers to consultation to expertise in the field of marketing, consumer technology adoption and education. Readability test was conducted on

respondents where results indicated a clear and comprehensive understanding of the questionnaire. The items of the questionnaire are as shown on Table 1.

Table 1: Items in Questionnaire

Variable	Items	Item Code
Performance Expectancy (PE)	ABC edtech is useful for my learning activities.	PE1
	ABC edtech allows me to accomplish learning tasks more quickly.	PE2
	ABC edtech increases my productivity in learning activities.	PE3
	ABC edtech would improve my learning performance.	PE4
	ABC edtech will increase my chances of getting better school levels.	PE5
Effort Expectancy (EE)	Learning how to use ABC edtech is easy for me	EE1
	It does not take a long time for me to learn to use ABC edtech based on my needs.	EE2
	ABC edtech is easy to use.	EE3
	It is easy for me to become skillful at using ABC edtech	EE4
	Interaction with ABC edtech is easy for me.	EE5
Social Influence (SI)	People who are important to me think that I should use the ABC edtech application.	SI1
	People who influence my behaviour think that I should use the ABC edtech application.	SI2
	People whose opinions I value prefer that I use the ABC edtech application.	SI3
	Most of the people around me are using the ABC edtech application.	SI4
	People whom I am familiar with think that I should use the ABC edtech application.	SI5
Facilitating Conditions (FC)	I have the resources necessary to use the ABC edtech application.	FC1
	I have the knowledge necessary to use ABC edtech.	FC2
	ABC edtech is compatible with other technologies I use.	FC3
	I can get help from others when I have difficulties using ABC edtech.	FC4
	To get the information about the use of ABC edtech is very easy.	FC5
Hedonic Motivation (HM)	It is fun for me to use the ABC edtech application.	HM1
	Features in ABC edtech (videos, tutorials, chat rooms) entertain me.	HM2
	Using ABC edtech is enjoyable	HM3
	I feel excited when using the ABC edtech application.	HM4
	Using ABC edtech will give enjoyment to my learning activities.	HM5
Price Value	The price of ABC edtech is in accordance with the benefits obtained.	PV1
	With the current price, ABC edtech has a good value for me.	PV2
	On the average price, ABC edtech gives good quality.	PV3
	I do not mind the amount of money spent on ABC edtech.	PV4
	ABC edtech is reasonably priced.	PV5
Habit (HT)	Using ABC edtech has become a habit for my learning activites.	HT1
	Using ABC edtech is something that I do without thinking/without considering other learning approaches	HT2
	Using ABC edtech is a part of my learning activity	HT3
	I am addicted to using ABC edtech	HT4
	I must use ABC edtech	HT5
Content (CN)	ABC edtech has a reasonable content choices that can be accessed through its application	CN1
	The contents that can be accessed through the ABC edtech application fulfill my needs.	CN2
	The contents that can be accessed through the ABC edtech application provide the precise educational contents that I need.	CN3
	The contents that can be accessed through the ABC edtech application entertain me.	CN4
	ABC edtech has up to date contents.	CN5
Continuance Intention (CI)	I intend to continue using ABC edtech rather than discontinue its use.	CI1
	My intentions are to continue using ABC edtech than using any other alternative means.	CI2
	I intend to increase my use of ABC edtech in the future.	CI3
	I will keep using ABC edtech as regularly as I do now.	CI4
	I will strongly recommend others to use ABC edtech.	CI5

4. Results

The pilot test was conducted on 30 respondents by filling out online questionnaire distributed through Google forms. All of the respondents are representatives of the seven regions being investigated. The data collected was processed using the SPSS software. The criteria of the validity refers to Friedenberg and Kaplan cited in Indrawati (2015:149) [8] where the "Corrected Item – Total Correlation" (CITC) is valid if the value is greater than 0,3. There are eliminated items that do not fit this criterion which are items PE2, PE3, HT1, and CI1. On the other hand, reliability test refers to the Cronbach-Alpha (CA) score where a value above 0.7 is considered reliable and all constructs satisfy this criterion. The result of the pilot test is shown in Table 2.

Table 2: Pilot Test Result

Item Code	CITC	CA
PE1	0.532	0.708
PE4	0.629	
PE5	0.431	
EE1	0.798	0.789
EE2	0.778	
EE3	0.489	
EE4	0.545	
EE5	0.285	
SI1	0.743	0.852
SI2	0.746	
SI3	0.596	
SI4	0.782	
SI5	0.481	
FC1	0.543	0.702
FC2	0.447	
FC3	0.546	
FC4	0.449	
FC5	0.320	
HM1	0.577	0.706
HM2	0.458	
HM3	0.459	
HM4	0.444	
HM5	0.388	
PV1	0.586	0.757
PV2	0.384	
PV3	0.565	
PV4	0.456	
PV5	0.660	
HT2	0.403	0.695
HT3	0.648	
HT4	0.505	
HT5	0.383	
CN1	0.557	0.687
CN2	0.390	
CN3	0.374	
CN4	0.521	
CN5	0.373	
CI2	0.633	0.817
CI3	0.627	
CI4	0.736	
CI5	0.458	

5. Conclusion

In conclusion, the pilot test results reveal that there are 9 constructs and 41 items which are valid and reliable. This shows that the measurement tool is considered good hence can be proposed as a comprehensive questionnaire to be used further in investigating the continuance intention of ABC edtech.

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