Modified Technology Acceptance Model For Measuring Online Training Adoption in Indonesia

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ABSTRACT

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Indonesia is indeed a very promising target market in EdTech sector. The large number of population and also the massive progress of internet and technology penetration are the main attraction for business player in EdTech sector. But it is not directly proportional to the users of edtech products. It shows the level of edtech product adoption still very low. This study aims to analysis potential market in Indonesian EdTech sector. The proposed model is a modified of the TAM model which is given several additional variables. This research used a set of questionnaire and valid data gathered from 161 samples. Data were analyzed by using Partial Least Square. The result shows that almost of all hypothesis were accepted. And the model has a strong predictive power for measuring future use behavior. User Satisfaction has the greatest influence on Future Use Behavior. And Interactivity is the most influential variable on User Satisfaction.

Introduction

Internet penetration has accelerated the growth of the online education marketsize. The used of internet is growing continuously in Southeast Asia. Forty million new users were registered and contributed to the increase in the number of internet users in Southeast Asia (Google, Temasek, & Company, 2020). Internet users, especially in Indonesia, reached 196.71 million of the total Indonesian population of 266.91 million people (APJII, 2020). The number of internet users was recorded after the addition of 25.54 million new users.

During the pandemic, there was an increase in internet usage time to an average of 4.7 hours per day (Google et al., 2020). This happened because of government policies on how to work (work from home), schools (online learning), and other activities carried out in new ways. After the easing policy occurred, the internet usage time became 4.3 hours per day (Google et al., 2020). Internet technology is an important part of human daily life.

Now, there are five leading e-Conomy sectors, namely e-commerce, transportation and food, online travel, online media, and financial services. In addition, two new
entrants have emerged, namely HealthTech and Education Technology (EdTech) (Google et al., 2020).

The pandemic has changed the lifestyle and also increased the level of adoption of digital technology in society. In particular, students are more familiar with and accustomed to doing distance learning. This is an advantage for the EdTech sector to offer its products to potential consumers. Moreover EdTech can serve not only for young people but also for adults.

Indonesia is indeed a very promising target market in EdTech sector. An estimated 55 million students are expected to be enrolled from kindergarten to higher education across Indonesia in 2019. The proportion of students by education level in Indonesia can be seen in the following table.

Table 1. Students in Every Level of Education (Ravenry, 2020)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total enrollment in 2018</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary School</td>
<td>25,238,923</td>
<td>47.51%</td>
</tr>
<tr>
<td>Secondary School</td>
<td>9,981,216</td>
<td>18.79%</td>
</tr>
<tr>
<td>Tertiary School</td>
<td>4,845,068</td>
<td>9.12%</td>
</tr>
<tr>
<td>Vocational School</td>
<td>5,009,265</td>
<td>9.43%</td>
</tr>
<tr>
<td>University Students</td>
<td>8,043,480</td>
<td>15.14%</td>
</tr>
</tbody>
</table>

The large population and also the massive progress of internet and technology penetration are the main attraction for business player in EdTech sector. Top 4 players in EdTech Market are RuangGuru (15 milion students / 28%), Zenius (11 milion users / 20%), Quipper (6 milion users / 11%), and Udemy (200 thousand users / 0.3%) (Ravenry, 2020). The great potential of the EdTech market sizes (55 milion students) is not directly proportional to the users of edtech products. It shows the level of edtech product adoption still very low (maximum 28% from total potential market). Those facts make research on the adoption of products offered by EdTech such as online courses, online training, online seminars, and online certifications important. The results of this research can later be used as input for EdTech business players in developing products that can be adapted with the needs of the Indonesian market.

There have been several studies exploring general online learning using the modified TAM model (Boateng, Mbrokoh, Boateng, Senyo, & Ansong, 2016; Ho et al., 2021; Singh, Sharma, & Paliwal, 2021). However, all of those researches still focuses on formal learning such as e-learning in higher education. There is still no research that focus on examining informal online learning such as online courses or online training in Indonesia. In fact, the product of the EdTech business is informal online learning.
Therefore, this study was conducted to explore the factors that influence users of EdTech product services in Indonesia.

**Literature Review**

*Technology Acceptance Model (TAM)*

In 1989 a Professor of Information Systems, Fred D. Davis developed the first model of TAM. Davis mentions Perceived Usefulness and Perceived Ease of Use as determining factors for someone to adopt a technological innovation (Davis, 1989).

Over the time, the Technology Acceptance Model was developed and additional variables were added to analyze the behavior of users of technological innovations. Mobile Payment is one of the research topics that uses TAM as a basic model to be further developed by modifying several variables (Oentoro, 2021; Rafdinal & Senalasari, 2021; Wong, Liu, Meng-Lewis, Sun, & Zhang, 2022). Another research topic that uses Extended TAM or Modified TAM to analyze consumer behavior is Online Shop (Akhlq & Ahmed, 2015; Chiu, Chang, Cheng, & Fang, 2009; Tong, 2010). There are still many different topics regarding the adoption of technological innovations that use TAM as a basic model, such as mobile game adoption (Okazaki, Skapa, & Grande, 2007), social media adoption (Loh, Wong, Quazi, & Kingshott, 2016; Rauniar, Rawski, Yang, & Johnson, 2014) and many more. The massive use of TAM to analyze the adoption behavior of technological innovations till now indicates that TAM is indeed a reliable model.

*Perceived Ease of Use and Perceived Usefulness in Online Learning*

Perceived usefulness is defined as the degree of belief that a person will improve their performance by utilizing a certain system. Meanwhile, Perceived Ease of Use is defined as the degree of confidence regarding the small or minimal effort expended when using a system (Davis, 1989).

Perceived Ease of Use has been proven to have a significant positive effect on intentions to use e-learning in several previous studies (Chen & Tseng, 2012; Islam, 2013). This indicates that the easier of using the e-learning, the higher the intention of using e-learning. In another study it was also revealed that Perceived Ease of Use had a significant positive effect on satisfaction, where further satisfaction had a significant positive effect on the use of e-learning in the future (Gaffar & Septyandi, 2020). This indicates that when e-learning is considered easy, participants will feel satisfied so that in the future they will continue to use e-learning. Boateng et. al. in his research proves that Perceived Ease of Use has a positive effect on Perceived Usefulness and Attitude (Boateng et al., 2016).
Someone will use an information system to support their activities depending on their perception of the usefulness / benefits of the system (Hanafizadeh, Behboudi, Abedini Koshksaray, & Jalilvand Shirkhani Tabar, 2014). Perceived Usefulness has been shown to have a significant positive effect on the intention to use an e-learning (Chen & Tseng, 2012; Gupta, 2019; Islam, 2013). Singh et. al. proves that perceived usefulness has a positive effect on attitude where attitude has a positive effect on continuance intention (Singh et al., 2021). Gaffar and Septyandi found that Perceived Usefulness had an effect on Satisfaction where satisfaction had an effect on future usage behavior. Therefore, the initial hypotheses for this study are as follows:

H1. Perceived Ease of Use has a positive effect on Perceived Usefulness.
H2. Perceived Ease of Use has a positive effect on Satisfaction.
H3. Perceived Ease of Use has a positive effect on Attitude.
H4. Perceived Usefulness has a positive effect on Attitude.
H5. Perceived Usefulness has a positive effect on Satisfaction.

**Interactivity**

Interactivity is represented as the extent to which users can participate in modifying forms and content in an environment in real-time (Steuer, 1992). While Pituch and Lee define System Interactivity as interaction between instructors and students and also collaboration in learning that results from these interactions (Pituch & Lee, 2006). Teachers can create online social assignments and manage students' interest and quality of learning by using online interactivity (Rodríguez-Ardura & Meseguer-Artola, 2016). In a study, it was proven that system interactivity had a positive effect on Perceived ease of use and Attitude (Ho et al., 2021). Singh et. al. in his research proves that interactivity has a positive effect on attitude (Singh et al., 2021). Therefore, the next group of hypotheses for this study are as follows:

H6. Interactivity has a positive effect on Perceived Ease of Use.
H7. Interactivity has a positive effect on Attitude.

**Cost-Effectiveness**

One important aspect that is always used to determine what factors influence the adoption of a technology is cost (El-Gohary, 2012). The cost and time that must be spent to travel to the place of learning is one of the important indicators of cost effectiveness which makes online learning very potential (Bartley & Golek, 2004). By choosing online learning, students can save more time and costs. From the two expert
opinions, it is proven that cost effectiveness is a very important variable in online learning. So, the next hypothesis raised in this study is as follows:

H8. Cost Effectiveness has a positive effect on Satisfaction.

H9. Cost Effectiveness has a positive effect on Attitude.

Continuance Intention

Several studies have concluded that Attitude will have a significant positive effect on the intention to continue using a technology (Boateng et al., 2016; Ho et al., 2021; Singh et al., 2021). This means that the more positive a person's attitude towards a technology, the greater the intention to continue using the technology. Another study states that user satisfaction has a significant positive effect on the behavior of using technology in the future (Gaffar & Septyandi, 2020). Indicators of user satisfaction are measured by continuing to use the application and providing recommendations to use the application to others (Chopra, Madan, Jaisingh, & Bhaskar, 2019). From these indicators, it can be seen that when the user is more satisfied, the user will continue to use a product and will also provide recommendations for the product to others. So, the final hypothesis proposed in this study is as follows:

H10. Attitude has a positive effect on Continuance Intention.

H11. User Satisfaction has a positive effect on Continuance Intention.

Method

This study aims to explore the factors that influence online training consumers in choosing training products. This research will use quantitative methods. However, due to the absence of an exact size of the Indonesian EdTech market, this study uses purposive sampling rather than random sampling (van Hoeven, Janssen, Roes, & Koffijberg, 2015). Respondents taken from consumers who have taken online courses / training in one of Edtech product throughout Indonesia. This study used an online survey spread from July to August 2022 and get 161 responses sent back. All of responses were valid responses used for data analysis.

The questions in the questionnaire are closed-ended questions with a Likert scale measurement level. The questions for each variable come from items that have been validated from previous studies. The variables in this model were taken based on a literature review in research journals (Gaffar & Septyandi, 2020; Sánchez, Hueros, & Ordaz, 2013; Singh et al., 2021).

Structural Equation Modeling-Partial Least Squares (SEM-PLS) is used to analyzed the collected data. Two stages of analysis carried out on the SEM-PLS are the
measurement model and the structural model. In the measurement model, the validity and reliability of the proposed model are measured. Loading Factor, Average Variance Extracted (AVE), Composite Reliability, and Cronbach Alpha were calculated in first stage. Meanwhile, at the structural model stage, the relationship between each variable is measured. Measurement of T statistics is done to test the hypothesis that has been taken. In addition, the predictive power of the proposed model was measured using R square.

Result and Discussion

Measurement Model

A confirmatory factor analysis was conducted to assess the validity and reliability of the data. Validity test can be done using convergent validity which is represented by loading factor (LF) and average variance extracted (AVE). The model is valid if each items has value of LF above 0.5 and AVE above 0.5 (Hair, Risher, Sarstedt, & Ringle, 2019). Reliability test can be done using Composite Reliability and Cronbach’s Alpha indicator. The model is valid if each items has value of Composite Reliability above 0.7 and Cronbach’s Alpha above 0.7 (Hair et al., 2019).

Analysis result shows the proposed model is valid and reliable after removed one item of Social Influence construct. All results of measurement model can be seen in following table.

Table 2. Validity and Realibility Test Result

<table>
<thead>
<tr>
<th>Variable</th>
<th>Item</th>
<th>LF</th>
<th>AVE</th>
<th>CR</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU</td>
<td>PU1: I find online training quite useful for adding knowledge (Singh, Sharma, &amp; Paliwal, 2020).</td>
<td>0.715</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PU2: Online training is fast and easy medium to get connected with trainer (Singh et al., 2020).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PU3: Online training leads to effective communication with trainer (Singh et al., 2020).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PU4: It is easy to pass useful information through online training (Singh et al., 2020).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PU5: Through online training, it is easy to understand the subject taught (Singh et al., 2020).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEoU</td>
<td>PEoU1: Medium/platform used for online training is easy to use (Singh et al., 2020).</td>
<td>0.838</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PEoU2: Features from medium / platform used for online training are quite flexible (Singh et al., 2020).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Item</td>
<td>LF</td>
<td>AVE</td>
<td>CR</td>
<td>CA</td>
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<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------</td>
<td>-----</td>
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<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>CE</td>
<td>CE1: I find online training affordable (Singh et al., 2020).</td>
<td>0.769</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CE2: I get value for money by attending online training for education (Singh et al., 2020).</td>
<td>0.909</td>
<td>0.724</td>
<td>0.887</td>
<td>0.812</td>
</tr>
<tr>
<td></td>
<td>CE3: It is worth the efforts and time I put on online training (Singh et al., 2020).</td>
<td>0.868</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter</td>
<td>Inter1: Online training has important interactive features (Singh et al., 2020).</td>
<td>0.764</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inter2: I feel the material and information that shared on online training is easy to understand (Singh et al., 2020).</td>
<td>0.857</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inter3: I feel the material and information that exist in online training can help improve the quality of my learning (Singh et al., 2020).</td>
<td>0.879</td>
<td>0.669</td>
<td>0.890</td>
<td>0.835</td>
</tr>
<tr>
<td></td>
<td>Inter4: I do not feel any technical problems while accessing the material or information while attending online training (Singh et al., 2020).</td>
<td>0.766</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATT</td>
<td>ATT1: I feel confident to take online learning in the learning process (Singh et al., 2020).</td>
<td>0.821</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATT2: I find it easier to learn on my own through online training (Singh et al., 2020).</td>
<td>0.805</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATT3: I am confident to take online training for my education (Singh et al., 2020).</td>
<td>0.911</td>
<td>0.735</td>
<td>0.917</td>
<td>0.879</td>
</tr>
<tr>
<td></td>
<td>ATT4: I am motivated to take online training for my education (Singh et al., 2020).</td>
<td>0.889</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>US1: I am satisfied with learning method of online training (Gaffar &amp; Septyandi, 2020).</td>
<td>0.938</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>US2: I would recommend to continue to do learning with online training (Gaffar &amp; Septyandi, 2020).</td>
<td>0.942</td>
<td>0.884</td>
<td>0.938</td>
<td>0.868</td>
</tr>
<tr>
<td>FUB</td>
<td>FUB1: For the future, I want to continue to take online training to help my learning process (Singh et al., 2020).</td>
<td>0.907</td>
<td>0.789</td>
<td>0.949</td>
<td>0.933</td>
</tr>
</tbody>
</table>
Variable & Item & LF & AVE & CR & CA \\
--- & --- & --- & --- & --- & --- \\
FUB2 : For the future, I plan to increase the intensity of taking online training to help my learning process (*Singh et al., 2020*). & 0.894 \\
FUB3 : For the future, I plan to take online training as my top priority in helping the learning process (*Singh et al., 2020*). & 0.896 \\
FUB4 : For future, I intend to take online training for continuously improving my skill (*Singh et al., 2020*). & 0.901 \\
FUB5 : For future, I intend to take online training for completing my tasks / my job in time without any fail (*Singh et al., 2020*). & 0.842 \\

Structural Model

In structural model, SEM-PLS software analyzed the relations of each construct which were represented by path coefficients (Beta) and T statistics. Besides that, SmartPLS also calculated the prediction values ($R^2$). Bootstrapping method was done to get the result. Value of samples and cases in Bootstrap was set the same with valid data researchers get which was 161. The path analyses can be seen in following figure.

![Path Analyses of Modified TAM](image)

Figure 2. Path Analyses of Modified TAM

Analysis result shows Future Use Behavior is affected by both of User Satisfaction and Attitude. These results prove that hypothesis 9 and hypothesis 10 are proven. This also confirms that the results of previous studies are supported (*Boateng et al., 2016; Gaffar & Septyandi, 2020; Ho et al., 2021; Singh et al., 2021*). In addition, User satisfaction has a greater influence on Future Use Behavior than Attitude in this study.
In this study it is proven that User Satisfaction is most influenced by Interactivity. The more interactive the materials and information provided in the online training, the higher the level of satisfaction of the online training participants. In addition, User Satisfaction is also influenced by Perceived Usefulness and Cost-Effectiveness. These results prove that hypothesis 5 and hypothesis 8. That result also support several previous studies (Bartley & Golek, 2004; El-Gohary, 2012; Gaffar & Septyandi, 2020). In this study also found that hypothesis 2 was rejected. Even though the respondents do not find it easy to follow online learning but still feel satisfied. This may be due to the large number of other factors that make respondents feel satisfied such as interactivity and cost effectiveness. In addition to influencing User Satisfaction, Interactivity also has the greatest influence on Attitude. Attitude is also influenced by Cost-Effectiveness.

This study also supports some previous research regarding attitude (Bartley & Golek, 2004; El-Gohary, 2012; Singh et al., 2021). From the results, hypothesis 7 and hypothesis 9 were accepted. As well as satisfaction, the attitude of users of online learning services will be strongly influenced by interactivity. Hypothesis 3 and hypothesis 4 were rejected based on the results in this study. The attitude of online learning service users remains good even though they do not feel the convenience and benefits when participating in online learning. The attitude of service users remains positive because it is more influenced by interactivity. The entire recap of the results of hypothesis testing in this study can be seen in the following table.

Conclusion

User Satisfaction has the greatest influence on Future Use Behavior. And Interactivity is the most influential variable on User Satisfaction. Therefore, the EdTech Business Player must prepare interactive materials and information in order to increase participant satisfaction so that participants will continue to use EdTech products.

Acknowledgment

I would like to thank the Bandung State Polytechnic for providing funding so that this research can be carried out properly. In addition, I am very grateful to PT Ebiz Prima Nusa for allowing me to conduct research using training participants as respondents.

References


APJII. (2020). LAPORAN SURVEI INTERNET APJII 2019 – 2020 (Q2). Retrieved from


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