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Research Article

Online Learning Acceptance Model of Indonesian Students During the COVID-19 Pandemic

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Abstract.
This study examines the application of the Technological Acceptance Model (TAM) concept proposed by Davis et al. (1989) to be adopted in online learning in higher education during the Covid-19 pandemic. The quantitative method with purposive sampling method was applied in this study to answer the research question. The online survey was used as a method of data collection. The result of this study contributes to the body of knowledge and gives some practical recommendations for this research.

Keywords: attitude toward use, behavior intention, perceived usefulness, perceived ease of use.

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1. Introduction

The COVID-19 pandemic affects all activities of human life, including in the field of education. Educational activities usually carried out face-to-face have now been stopped to avoid the spread of the COVID-19 pandemic. Since then, the city and transport have been shut down, with many business and educational activities and people's daily lives temporarily suspended" (Zhang et al., 2020)[1]. The government has taken many steps to prevent its spread. One of them is through a decree letter from the Ministry of Education and Culture Directorate of Higher Education No.1 of 2020 regarding preventing the spread of Coronavirus Disease (Covid-19) in universities. Through this decree, the Ministry gave instructions to universities to conduct online learning and advised students to study from their homes. One alternative conducted during the Covid-19 emergency is online lectures using virtual meetings and the internet, which can increase the role of students in the learning process (Chang et al., 2017;[2] Monny, 2022)[44].

Raaper and Brown (2020) stated that the shift towards online education made some applications become a critical support tool during the pandemic[3]. Online learning requires the support of mobile devices such as smartphones, tablets, and laptops to access information anywhere and anytime (Gikas and Grant, 2013)[4]. Online-based technology can influence pedagogical development, especially in teaching and learning (Koc, 2017)[5]. Koc (2017) states that there is an opportunity to improve the quality of teaching and learning by utilizing technology, namely by changing the paradigm of the teaching and learning process from face-to-face to an online teaching-learning process[5]. Students can adjust their conditions, where with the help of telecommunication networks, they can be accessed anytime and anywhere (Dabbagh and Kitsantas, 2007)[6].

Several previous studies have investigated the role of online platforms in replacing face-to-face functions. Quartiroli et al. (2017)[7], Matthews et al. (2018)[8], and Archibald et al. (2019)[9] examined the use of video conferencing in the learning process. Their research showed that video conferencing can replace the direct face-to-face function in the learning process; even the use of video conferencing was said to be more effective and efficient. Hsu (2019)[10], Dixon et al. (2019)[11], and Fedic et al. (2015)[12], in their research, showed that video conferencing can help the learning process more effectively, efficiently, and innovatively. Several researchers-built models to analyze and understand the factors that influence the acceptance of technology, including those recorded in various literature in information technology. The TAM model developed by Davis (1989) is one of the most widely used models in information technology research, so this study used it to determine how acceptance of online learning uses the variables in TAM[13].

TAM consists of two main variables: perceived ease of use and perceived usefulness, determining a person's behavioral intention to use technology. Many users' benefits of using online learning are measured using the variables Perceived Usefulness and Perceived Ease of Use. According to Aakers and Myers (1997), Attitude toward use is an attitude of liking or disliking a technology use[14]. This Attitude of liking or disliking a product can predict the behavior of a person's intention to use technology or not to use it. Attitude toward using technology (Attitude toward using technology) is defined as the user's evaluation of their interest in using technology (Hanggono, 2015)[15]. Attitude toward use is a motivating factor influencing people's intention to use certain things (Jan et al., 2019)[16]. In their research, Cheung and Vogel (2013) stated that Attitude toward use is essential in explaining the use of online learning technology[17]. Online education becomes more fun than traditional classroom learning when learning uses

more technology. Students who find online learning fun will intend to use the technology (Hussein, 2018)[18]. Based on the above background, this study aims to determine the acceptance factor of the online learning platform as a learning medium using the variables in the Technology Acceptance Model (TAM).

2. Methodology

2.1. Online Learning

Online or network learning is a learning activity that utilizes the internet network as a delivery method, interaction, and facilities and is supported by various other learning services (Brown et al., 2000)[19]. According to Hanum (2013), online learning is a form of learning model facilitated and supported by information and communication technology[20]. Online can be defined as a form of information technology applied in education in the form of a virtual world (Hanum, 2013)[20]. Sandiwarno (2016) stated that "e-learning is a new form of pedagogy for learning in the 21st century[21]. E-teachers are e-learning instructional designers, facilitators of interaction, and subject matter experts". Online learning is a type of teaching and learning that delivers teaching materials to students using the internet. Online learning emphasizes the learning process by using internet technology to provide various things that can improve knowledge and skills (Elyas, 2018)[22].

2.2. Technology Acceptance Model (TAM)

TAM, which stands for Technology Acceptance Model, is often used in technology adoption research. According to Davis et al. (1989), TAM believes that the use of information systems can improve the performance of a person or organization and make it easier for users to complete work[23]. According to Lee et al. (2018), the variables in TAM are expected to help predict a person's attitude and acceptance of technology[24]. They can provide the necessary basic information about the factors that drive the individual's attitude.

TAM is an adaptation of Davis's (1989) Theory of Reason (TRA), explaining that the primary purpose of TAM is to provide a basis for exploring external factors on user beliefs, attitudes, and goals[13]. TAM considers that two individual thoughts, namely perceived usefulness and perceived ease of use, are the main influences for technology acceptance behavior (Rizun and Strzelecki, 2020)[25]. Perceived usefulness describes a

person's belief that using the system will improve performance (Rizun and Strzelecki, 2020)[25]. In this case, a person has confidence when using certain technologies to improve performance. Perceived usefulness illustrates that the technology used will provide benefits to its users. Perceived ease of use describes a person's level of confidence that the use of information systems is easy and does not require hard effort from the wearer (Rizun and Strzelecki, 2020)[25]. Attitude toward use (attitude toward use), according to Aakers and Myers (1997), is an attitude of liking or disliking the use of a product, which is an attitude of liking or opposing a product[14]. Use a product or not use it. Attitude toward using technology (attitude toward using technology) is defined as the user's evaluation of their interest in using technology (Hanggono, 2015)[15]. Attitude is a driving factor for people that influences their intention to use certain things (Jan et al., 2019)[16].

2.3. Attitude Toward Use on Behavior Intention

Attitude toward using a technology (attitude toward use) evaluates users' interest in using online applications as learning media. Davis et al. (1989) defines an attitude towards behavior as the user's evaluation of their interest in using the system ("the user's evaluation of the desirability of his or her using the system.")[23]. Previous studies have shown that this attitude affects positively behavioral intention. In line with what Shanmugam et al. (2014) stated, perceived usefulness can influence consumer interest with an attitude toward use[26]. This statement is reinforced by Park (2009)[27], Hussein (2017)[18], Pertiwi and Sharif (2019)[28], and Tan (2019)[29]. Various online learning systems have been developed as research objects (Smet et al., 2012)[30]. Online learning systems can integrate different combinations of text, graphics, audio, video, and many others can be integrated into these systems to cause positive reactions influencing intentions to use the system (Hussein, 2017)[18]. Based on the statement above, the following hypothesis is formed:

H1: *Attitude toward use has a positive effect on behavior intention*

2.4. Perceived Usefulness on Behavior Intention

In TAM, perceived usefulness is hypothesized to predict a direct relationship with behavioral intentions in using technology (Park, 2009)[27]. Venkatesh et al. (2003) stated that in the extended TAM model, perceived usefulness is significant on behavioral intention and is one of the most substantial factors for predicting intention to use a particular

system[31]. In online learning, the effect of perceived usefulness on intention to use has been tested by several previous studies and has significant positive results (Thieu, 2013)[32]. In various studies, the perceived usefulness variable influences the formation of a person's intention to use technology. Perceived usefulness has a significant positive effect on behavior intention to use as in the research conducted by Al-Maroof and Al-Emran, (2018)[33]; Abbas and Hamdy, (2015)[34] in the context of online learning services (Liu et al., 2009)[35] and e-learning (Lin, 2007)[36]. The greater the perceived usefulness by the user, the greater the interest in using it will be. Users find online learning using the zoom application to be practical, fast, and valuable so it makes users have the intention to use the online application. Based on the statement above, the hypothesis:

H2: *Perceived usefulness has a positive effect on behavior intention*

2.5. Ease of use on Attitude Toward Use

Perceived ease of use is a person's belief that using an information technology system will be free from effort (Jogiyanto, 2008)[37]. Several previous studies have shown that perceived ease of use has a positive effect on attitudes toward use in the use of technology. Perceived ease of use is a parable of clear and understandable treatment in the use of information technology and ease in operating the use of technology according to what is needed by its users (Guriting and Ndubisi, 2006[38]; Davis et al., 1989[23]). Al-Somali et al. (2008) examined the factors using the Technology Acceptance Model (TAM), which took Saudi Arabian subjects[39]. Based on this research, get the results that perceived ease of use affects attitude toward using. The same study was also investigated by Adam et al (1992)[40], which showed that perceived ease of use was a positive and significantly affected attitude toward using. Park (2009)[41] and Nagy (2018)[42] also found that perceived ease of use was completely related and incredibly pompous.

H3: *Perceived ease of use has a positive effect on attitude toward the use*

2.6. Perceived Usefulness on Attitude Toward Use

Perceived usefulness is how a person believes that using technology will improve their job performance. In line with Davis (1989) stated, perceived usefulness is a person's belief that using a particular information technology system will improve his work performance and benefit the people who use it[12]. Research conducted by Nasri dan

Charfeddine (2012)[42] and Tan (2019)[29] examines empirical investigative studies on the acceptance of the use of technology. Based on this study, the results show that perceived usefulness is positively related and significantly affects attitude toward use. So that the researcher formulates the hypothesis as follows:

H3: *Perceived usefulness has a positive effect on attitude toward use*

2.7. Perceived Ease of Use on Perceived Usefulness

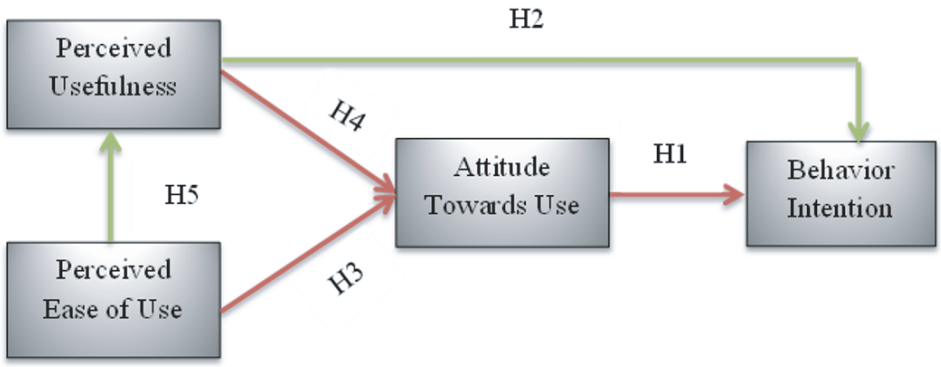

Figure 1: Proposed Theoretical Framework.

TAM combines perceived ease of use and perceived usefulness of technology as two key constructs. Perceived ease of use refers to the user's perception of the effort that must be expended to use technology and the extent to which the technology can be understood or not. Research conducted by Amin et al. (2014)[43] found that perceived ease to use has a positive relationship with perceived usefulness related to using websites in Malaysia. This result is in line with previous research that explains a significant effect between perceived ease to use and perceived usefulness (Davis, 1989[12]; Adams et al., 1992[40]; Moon and Kim, 2001[44]; Gefen and Straub, 2003[45]). Thus, the ease that the user has felt makes the information system he uses becomes useful that can help complete his tasks and work. Based on the statement above, a hypothesis can be built:

H5: Perceived *ease of use has a positive effect on perceived usefulness*

3. Research Method

The type of research used in this research is quantitative research. This study uses a causal research design to analyze the relationships between one variable and another (Hair et al., 2007)[46]. The intervention in this study is relatively minimal because this

Operational definition	Indicators	Scale	Source
Behavioral intention is a behavioral tendency to continue using the Zoom application as a learning medium	1. I intend to use the zoom application during lectures. 2. I will often return to using the zoom application. 3. I intend to often use the zoom application in my learning process.	*Likert*	Abudallah & Ward (2016).
Attitude toward use is the tendency of initial responses to favorable or unfavorable conditions on a particular object.	1. I don't like the idea of using the zoom app as an online learning medium 2. In general, I have compatibility in using the zoom application as an online learning medium. 3. I believe that using the zoom app for online learning is a good idea 4. Using the zoom app is a stupid idea.	*Likert*	Adapted from Mariia Rizun and Artur Strzelecki, (2020).
Perceived Ease of Use is a person's level of confidence that in using online learning applications no hard work is required.	1. I find the zoom app easy to use. 2. Mastering the zoom application will be easy for me. 3. My interactions using the zoom app are clear and understandable. 4. It is easy for me to find the required information using the zoom app	*Likert*	Adapted from Mariia Rizun and Artur Strzelecki, (2020).
Perceived usefulness is the extent to which a person believes that using the zoom application will improve their performance in the learning process	1. Using the zoom app will increase my effectiveness in online learning. 2. Using the zoom app will improve my learning performance. 3. Using the zoom app will increase my productivity in online learning. 4. I found the zoom app useful for my studies	*Likert*	Adapted from Mariia Rizun and Artur Strzelecki, (2020).

Figure 2: Operationalization of Variables.

study uses cross-sectional research, namely research in which data collection is carried out by distributing questionnaires only at one time which can be done over days, weeks, or months to answer research questions (Hair et al., 2007)[46]. In this study, the sampling technique used is the Non-Probability Sampling method. The non-probability sampling technique used is the purposive sampling technique. The author chooses a purposive sampling technique by setting specific considerations or criteria that must be met. Sample criteria in this study. The sampling criteria needed in this study are: 1) using an online platform as an online learning medium; 2) having used the zoom application for more than 12 credits of lectures because the frequency of using the zoom application shows the convenience of the users in using the zoom application; 3) more than 60% of learning is done online using apps.

The data collection method in this study used an online questionnaire made using a google form which can be accessed at the following link https://forms.gle/294exFh2GXnD4yv9. The questionnaire was distributed through social media such as WhatsApp, Instagram, and Facebook with the following techniques:

1. Disseminating online questionnaire links that had been compiled through WhatsApp groups.
2. Asking for help from relatives/friends to help spread the word. online questionnaire link through their WhatsApp group friendship.
3. Spread the questionnaire through Instagram, Facebook, Twitter, and Telegram.
4. Then the respondent presses the questionnaire link, and after that, a questionnaire form appears, which is ready to be filled.

4. Result and Discussion

No	The goodness of Fit Index	Standard Cut off Value	Result	Description
1	*Chi-Square*	Expected small	297.347	Marginal
2	*Significance probability*	≥ 0.05	0.000	Marginal
3	RMSEA	≤ 0.08	0.087	Marginal
4	GFI	≥ 0.90	0.896	Fit
5	AGFI	≥ 0.90	0.845	Marginal
6	CMIN/DF	≤ 5.00	3.671	Fit
7	TLI	≥ 0.90	0.933	Good Fit
8	CFI	≥ 0.90	0.949	Good Fit
Source: Primary Data Processed with AMOS 22.0				

Figure 3: Goodness of Fit Indices.

This data analysis will conceptually describe the results obtained and compare them with the findings of previous studies. The analytical tool used in this research is Structural Equation Modeling (SEM) using the AMOS (Analysis of Moment Structure) version 22.0 program package. SEM testing is carried out in two stages: the measurement model and the structural model. The measurement model tests how a set of items represents many constructs (Hair, 2010, p.695)[47]. The structural model is intended to test the suitability of the theory-based hypothesis model with empirical research data (collected sample data). In this study, two goodness of fit index categories were used, namely absolute measure and incremental fit index.

The goodness of fit structural model results indicates that several indices have met the appropriate criteria. Hair et al. (2010) state that one of the goodness of fit indices criteria has been completed[47]. All constructs of the model can be expressed as a research fit model so that the proposed model is the final model of the structural model and is the model that will be used in the following analysis step. In the next stage, the

Hypo-thesis	Endogen Variables		Exogen variables	*Direct Effect*	*Critical Ratio*	p	**Conclusion**
1	BI	<---	ATU	0.014	0.729	0.466	**Rejected**
2	BI	<---	PU	0.963	14.870	***	**Accepted**
3	ATU	<---	PE	-0.072	-0.168	0.867	**Rejected**
4	ATU	<---	PU	0.884	2,161	0,031	**Accepted**
5	PU	<---	PE	1.123	14.657	***	**Accepted**
Source: Primary Data Processed with AMOS 22.0							

Figure 4: Results of Research Hypothesis Testing.

results of testing the research hypothesis can be said to be influential and significant if the value generated from the structural model analysis has a critical ratio value (C.R) > 1.96 and a probability value < 0.05.

1. Attitude toward use has a positive effect on behavior intention with a direct effect value of 0.014. Attitude toward use has no significant effect on behavior intention with a p-value > 0.05, namely p = 0.466, and a CR value of 0.729 (<1.96), so it is appropriate with the test criteria H1 is rejected.

2. With a direct effect value of 0.963, p-value = 0.000, and a CR value of 14,870 (> 1.96) on the effect of perceived usefulness on behavior intention, this study obtained the result that perceived usefulness has a significant positive impact on behavior intention. Hence, it follows the H2 test criteria. Accepted.

3. Perceived ease of use positively affects attitude toward use with a direct effect value of -0.072. Attitude toward use has no significant effect on behavior intention with a p-value > 0.05, namely p = 0.867, and a CR value of -0.168 (<1, 96). Then according to the test criteria, H3 is rejected.

4. The results of the tests carried out in this study found that perceived usefulness had a significant positive effect on attitude toward use with a direct effect value of 0.884, a P value of 0.031, and a critical ratio value of 2.161 (> 1.96), so according to the test criteria H4 was accepted.

5. Perceived ease of use positively affects perceived usefulness with a direct effect value of 1.123. Perceived ease of use also significantly impacts perceived usefulness with a p-value <0.05, namely p = 0.000, and a CR value of 14,657 (> 1.96). Then according to the test criteria, H5 is accepted.

5. Conclusion and Recommendation

The results of hypothesis testing show that perceived usefulness has a positive effect on behavior intention in online learning applications. The result indicates that the zoom learning application provides practicality in its utilization. The Zoom Meeting application is helpful for students and lecturers as an alternative learning medium during the pandemic because both parties can still carry out learning without face-to-face meetings. Through the zoom application, lecturers can still convey learning orally to students online. The process of verbal communication can receive a result and a more precise understanding than communicating in writing. In addition, the use of the Zoom Meeting application is one of the online learning media that provides benefits to students in saving time and costs. This study also confirms the findings of research conducted by Al-Maroof and Al-Emran, 2018[33]; Abbas and Hamdy, 2015[34]) in the context of online learning services (Liu et al, 2009)[35] and e-learning (Lin, 2007)[36]. They found perceived usefulness had a positive and significant effect on behavior intention to use. Students feel that online learning using the Zoom application is effective and valuable so that it gives users the perspective to use online applications.

The results of hypothesis testing show that perceived ease of use has no significant effect on attitude toward use. The hypothesis in this study is not proven, which shows that the comfort perceived by students does not always have a positive impact on attitudes to using online learning applications. The research results by Al-Somali et al. (2008)[39] found that perceived ease of use affects attitude toward using. The same study was also investigated by Adam et al (1992)[40], which showed that perceived ease of use was positively related and significantly affected attitude toward using. Park (2009)[27] and Nagy (2018)[41] also found that perceived ease of use was a completely related and incredibly pompous attitude toward use. The findings of this study are not in line with the results of previous studies. Students find it easy because the application system can be studied independently. The use of the Zoom Meeting application is considered very practical. The Zoom application can also be accessed on all desktops and mobile platforms. Although students feel that using the zoom application is easy to use, they do not always have a positive attitude toward using the application. The result aligns with the first hypothesis, where students feel more comfortable carrying out classroom learning directly compared to using online applications. Students do find the zoom application easy to use, but this application cannot bring the reality of classroom learning into virtual form.

The results of hypothesis testing indicate that the fourth hypothesis in this study is accepted, stating that perceived usefulness has a positive effect on attitude toward use in the context of using online learning applications. The zoom application can be categorized as an online learning media, which can be interpreted as a type of teaching and learning that allows the delivery of teaching materials to students using Internet media. Online learning media as an alternative to electronic-based education provides many benefits, especially for the educational process carried out by distance. Some of this application's useful learning support features include sharing materials, videos, and discussions. The Zoom application offers many advantages. The advantages in question include the Zoom application being able to record all learning activities between lecturers and students during the learning process for a long time. The Zoom application allows the tutor to only act as a facilitator, and more learning activities are carried out by students so that indirectly student learning independence will be formed.

On the other hand, the benefit of using the zoom application is that lecturers and students during the learning process are not stuck in one space and time to carry out learning activities. Students do not have to come to class at a particular time. Likewise, teachers can change and add learning materials anytime and anywhere, both in text and visuals (modules and PowerPoint slides) and learning videos, thus enabling learning to be carried out longer according to learning needs. The benefits of the zoom application on learning activities create a pleasant attitude for students in learning, thereby increasing their performance in education and increasing the efficiency and effectiveness of learning. The findings of this study confirm the results of previous research conducted by Nasri (2012)[41] and Tan (2019)[29] examining the acceptance of the use of technology. This study found that perceived usefulness is positively related and has a significant effect on attitude toward the use.

The analysis of the structural research model shows that perceived ease of use has a positive and significant effect on perceived usefulness. The result shows that the convenience of using the Zoom online learning application ultimately becomes more useful for respondents. The zoom application provides functional value as an online learning medium in helping a good learning process. Students can still carry out learning facilitated face-to-face interaction via video conference with a PC, laptop, or smartphone. The zoom application is used as a medium of remote communication by combining video conferencing and online meetings. The zoom application in distance learning will significantly assist students in education because educators can interact even in different places. Amin et al. (2014) found that perceived ease to use positively correlates with perceived usefulness[43]. This result is in line with previous research,

which explains a significant effect between perceived ease of use and usefulness (Davis, 1989[13]; Adams et al., 1992[40]; Moon and Kim, 2001[44]; Gefen and Straub, 2003[45]). Thus, it can be concluded that the convenience felt by the user makes the technology he uses useful and can help complete his tasks and work.

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