

Conference Paper

Factors that Affect the Intention to Use E-learning among University Lecturers

Cecilia Titiek Murniati^{1*}, Heny Hartono¹, Agus Cahyo Nugroho²¹English Department, Soegijapranata Catholic University, 50234, Indonesia²Information System, Department, Soegijapranata Catholic University, 50234, Indonesia**ORCID ID**Cecilia Titiek Murniati: <https://orcid.org/0000-0001-6857-7007>**Abstract.**

University lecturers are one among many people who have been affected by the pandemic. Lecturers were forced to use a learning management system, grapple with video conferencing software, and cope with various unpredictable technical issues. In short, external forces seem to pressure lecturers to refine their digital skills and use e-learning as the only way to deliver the materials whenever they were unable to meet face-to-face with students. This study investigates what factors determined lecturers' intention to use e-learning in their classes. The results of this study suggest that technology literacy and attitude have positive correlations with lecturers' intention to use e-learning.

Keywords: intention to use e-learning; attitude; self-efficacy; technology; literacy; technology comfort level

Corresponding Author: Cecilia
Titiek Murniati; email:
c_murniati@unika.ac.id

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1. Introduction

Current debates in educational technology emphasize the use of digital technology in education as a tool or an enabler. Many people perceive technology merely as a tool in achieving learning outcomes, while other people view technologies as enablers. The perception of technology as a tool emphasizes the passive use of technology to assist learning while the latter emphasizes the more active use of technology to empower teachers and students in content creation and sharing. Partnership for the 21st Century Learning (P21) proposed a framework to formulate the skills and knowledge students and teachers need to succeed in work force and daily life for the 21st century (1). They suggested that in order to succeed both academically and non-academically, students need to master key subjects. They are English, reading, or language arts, world languages; arts; mathematics, economics; science; geography; history; government; and civics. To equip students for the increasingly complex world and competitive workforce,

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they need a set of skills. They are learning and innovation skills, information, media, and technology skills, as well as life and career skills. United Nations Educational, Scientific and Cultural Organization (UNESCO) along with The International Society of Technology in Education (ISTE) further adds that educators also have to possess information and communication technology (ICT) competencies which comprise technology literacy, knowledge deepening, and knowledge creation (2). Teachers are expected to be able to equip students in adapting with new technologies, solve complex problems, and to engage in knowledge creation and knowledge sharing. Therefore, teachers' technology adoption in classrooms is integral for the development of the 21st century skills.

Existing research on the implementation and adoption of e-learning identifies internal factors which play a significant role in the use of e-learning such as attitudes (3), self-efficacy (4), technology/digital literacy (5-7), technology readiness (8-10), and motivation (11-12). Other studies on e-learning found external factors accounting for the technology adoption. They are institutional supports (13), policies (14-15), and academic atmosphere (16). Studies on the effects of technology comfort level and teachers' previous experience were currently underrepresented. This study intends to look at correlates of the intention to use e-learning. Using Pearson's Correlation, this study has five hypotheses. They are H1. Technology literacy positively affects the Intention to Use E-learning, H2. Technology comfort level positively affects the Intention to Use E-learning, H3. Previous experience in using e-learning positively affects the Intention to Use E-learning, H4. Self-efficacy positively affects the Intention to Use E-learning, H5. Attitude positively affects the Intention to Use E-learning. The data were collected from the questionnaires distributed to university's lecturers in several private universities in Java.

2. Method

This study is quantitative in nature. This design was selected because the study examines the relationship among variables (17) to understand the factors that determine the intention to use e-learning among university lecturers. The participants in this study consisted of 60 lecturers in seven private universities in Central Java. They were selected using convenience sampling.

This study aims to test the following hypotheses:

H1. Technology literacy positively affects the Intention to Use E-learning.

H2. Technology comfort level positively affects the Intention to Use E-learning.

H3. Previous experience in using e-learning positively affects the Intention to Use E-learning

H4. Self-efficacy positively affects the Intention to Use E-learning.

H5. Attitude positively affects the Intention to Use E-learning.

The data for this study were collected from online questionnaire. The independent variables for this study were digital literacy, technology comfort level, previous experience in e-learning use, self-efficacy, and attitude. The dependent variable was the Intention to Use E-learning. All variables used Likert Scale for the response items. The following are the descriptions of each variable and the proposed hypotheses.

Variables

Technology literacy measured lecturers' ability to use, comprehend, manage, and analyze technology safely, effectively, and responsibly. For this variable, participants were required to rate themselves into three categories, namely novice, intermediate, or advanced user of technology. Some studies on e-learning found that technology literacy positively affects intention to use e-learning (5-7). The proposed hypothesis for this variable is H1. Technology literacy positively affects the Intention to Use E-learning.

Technology comfort level refers to how comfortable lecturers deal with digital technology. Technology comfort has been cited to correlate with perception toward technology (18) and intention to adopt new technology(19). The hypothesis for this variable is: H2. Technology comfort level positively affects the Intention to Use E-learning.

One of the factors that accounts for e-learning adoption is previous experience with e-learning (3)(20). In their study, Mailizar, Almanthari, & Maulina found that attitude toward e-learning use and e-learning experience were key determinants of e-learning adoption (3). Thus, the hypothesis will be: H3. Previous experience in using e-learning positively affects the Intention to Use E-learning.

Self-efficacy is the one's perception of his ability in completing a task. In technology adoption, self-efficacy has been cited to be related to e-learning satisfaction (3)(21-25). Thus, the hypothesis will be H4. Self-efficacy positively affects the Intention to Use E-learning.

Studies on e-learning cited attitude as one of the key determinants of e-learning adoption (26) and satisfaction (23)(27). Thus, the proposed hypothesis will be: H5. Attitude positively affects the Intention to Use E-learning.

The data for this study were collected from a questionnaire sent to lecturers in private universities in Central Java. The participants were recruited using convenience sampling. 60 lecturers participated in this survey. The independent variables for this study were digital literacy, technology comfort level, previous experience in e-learning

use, self-efficacy, and attitude. The dependent variable was the Intention to Use E-learning.

The purpose of this study is to prove several hypotheses. They are:

H1. Digital literacy positively affects the Intention to Use E-learning.

H2. Technology comfort level positively affects the Intention to Use E-learning.

H3. Previous experience in using e-learning positively affects the Intention to Use E-learning.

H4. Self-efficacy positively affects the Intention to Use E-learning.

H5. Attitude positively affects the Intention to Use E-learning

3. Results and Discussion

3.1. Results

3.1.1. Gender

There were 60 lecturers participating in this study. As shown in Figure 1, out of the 60 respondents, 58.3% were male, and the rest (41.7%) were female.

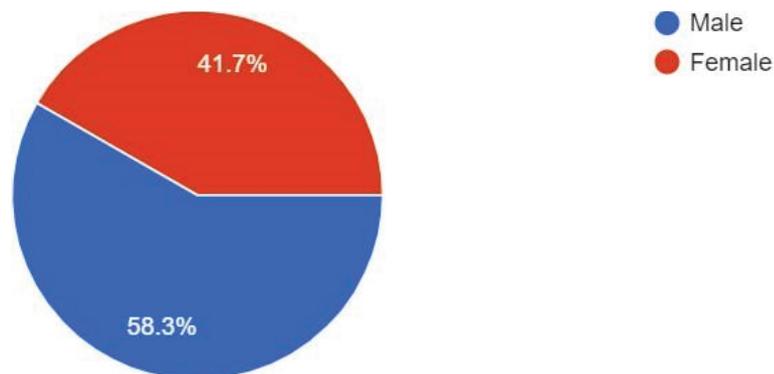


Figure 1: Gender of respondents.

3.1.2. Technology literacy

This question was intended to understand lecturers' perceived level of technology literacy. The figure below summarizes the responses:

We can see from Figure 2 that out of 60 lecturers, more than half of the respondents, claimed to have intermediate knowledge and experience of using computers or digital

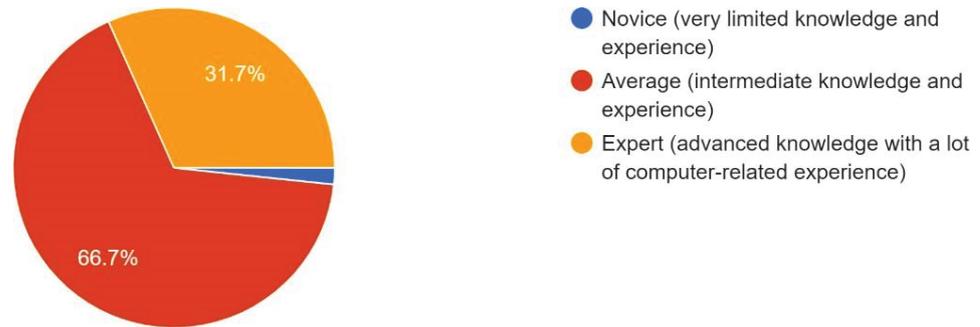


Figure 2: Lecturers' perceived level of digital literacy.

technology. 31.7% reported that they were advanced user of digital technology. Only 1 respondent was a novice.

3.1.3. Technology comfort level

From the collected data on technology comfort level, most lecturers (66.1%) reported that they were comfortable with technology. 32.2% said they were very comfortable with technology. Only 1 person reported that he was not comfortable with technology. Figure 3 below presents the result of the technology comfort level of the participants.

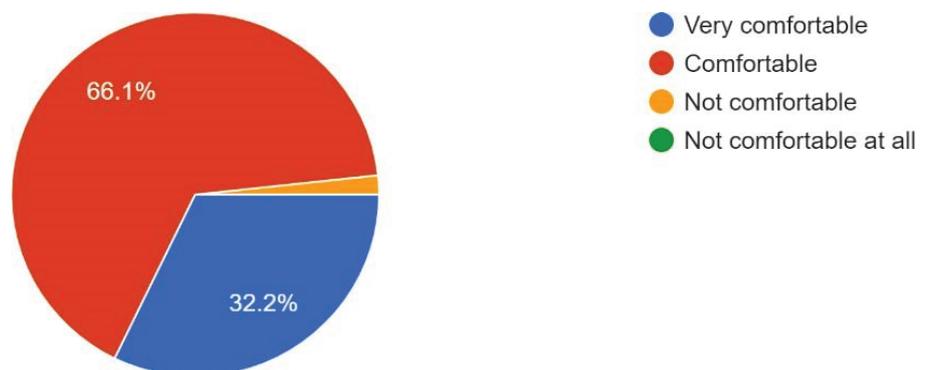


Figure 3: Lecturers' perceived level of technology comfort.

3.1.4. Previous experience with e-learning

When asked about the previous experience with e-learning, more than three fourths of the respondents reported they had used e-learning before, while the rest (23.3%) had no previous experience in using e-learning.

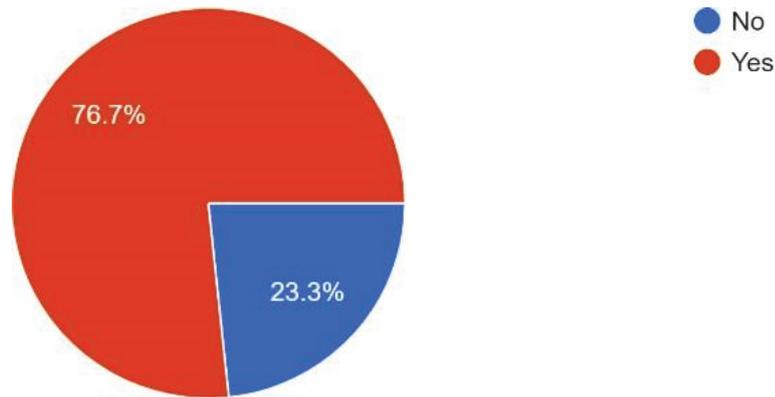


Figure 4: Previous experience with e-learning.

3.1.5. Attitude

In this part, there were initially 12 question items. However, after the reliability and the validity test was conducted, one item had to be deleted. Thus, only 11 items were used for data analysis.

TABLE 1: Descriptive statistics of Attitude.

No	Statements	Means	SD
1	E-learning is necessary to accommodate the needs of today's young generation.	3.41	0.61
2	E-learning can make teaching enjoyable.	2.96	0.66
3	I receive technical supports from my institution when I use e- learning.	3.18	0.72
4	Technical support for e-learning is vital in the implementation of e-learning.	3.23	0.64
5	Technology-related problems do not prevent me from using e- learning.	3.13	0.53
6	I am not easily anxious when it comes to the use of technology because I am good at trouble shooting.	3.06	0.72
7	Good e-learning policy is needed for e-learning implementation.	3.23	0.53
8	I have no problem using e-learning because the Internet connection in my university is excellent.	2.86	0.72
9	E-learning allows teachers and students to connect more easily.	3.13	0.67
10	I can meet my teaching goals better when I use e- learning.	2.66	0.75
11	Revamping my courses is necessary when I use e- learning.	3.13	0.48

From the responses, we can see that Statement 1 “E-learning is necessary to accommodate the needs of today’s young generation” had the highest mean score ($m = 3.41$). This implies that the respondents mostly agreed that e-learning matches with students’

needs. This attitude, however, does not reflect lecturers’ perceived benefit of e-learning in their classes. Lecturers’ responses for Statement 2 and 10 implies that e-learning does not automatically make teaching enjoyable (m = 2.96). They also had a slightly negative attitude for the benefit for e-learning in achieving the teaching goals (m = 2.66) In implementing e-learning, technical supports are considered vital. The mean for Statement 4 “Technical support for e-learning is vital in the implementation of e-learning” is 3.23. This means that lecturers agreed with the importance of technical support when they use or plan to use e-learning. In line with their response on the importance of technical support, most lecturers reported that their universities provided technical support (m=3.18). However, for Statement 8 “I have no problem using e-learning Because my university’s Internet connection is excellent”, the mean score is 2.86. This means that the Internet connection is still a problem in most universities. In addition to technical support, lecturers believed that institutional policies regarding e-learning are required for e-learning implementation (m=3.23).

3.1.6. Self-Efficacy

In this part, there are seven (7) question items. There was no item deletion for this part because all items were reliable and consistent.

TABLE 2: Descriptive statistics of Self-Efficacy.

No	Statements	Means	SD
1	I can use the Internet to search for teaching materials.	3.66	0.47
2	I am confident in my ability to deal with technical problems when I use e-learning.	3.11	0.61
3	I have no problems using various software applications.	3.03	0.66
4	I can understand the e-learning jargons most of the time.	3.03	0.64
5	I am confident with my ability to select appropriate activities when using e-learning.	3.05	0.64
6	I am confident with my ability to revamp my class designs when using e-learning.	3.06	0.66
7	I am confident with my ability to use e-learning to encourage students to become knowledge creators.	2.88	0.61

Self-efficacy refers to the perceived ability of completing a task. In this case, self-efficacy is related to how an individual perceives his/her ability in completing a task using the computer or e-learning. Table 2 shows the result of the descriptive statistics of self-efficacy variable. Out of the seven statements, six of them have the mean scores more than 3, which means the responses are on the positive sides. From the results of descriptive statistics analysis, we can see that lecturers were most confident in

using the Internet to look for teaching materials ($m=3.66$). They also reported that they had the necessary skills to deal with the technical issues in e-learning ($m=3.11$). They had no problems in using various applications ($m=3.03$) and understood e-learning jargons ($m=3.03$). They were confident with their ability to select appropriate activities and modify their class designs ($m=3.05$ and $m=3.06$ respectively). However, they were not confident with their ability to encourage students to become knowledge creators ($m=2.88$). This implies that the respondents in this study were skeptical if implementing e-learning will guarantee students to become more creative.

3.1.7. Hypothesis Testing

To test the hypothesis, the researchers first undertook the Reliability and Validity tests using Cronbach’s Alpha. Cronbach’s Alpha is a measure of internal consistency. It is used to measure how closely related a set of items are as a group. If the value of the Cronbach’s Alpha is high (> 0.7), this means that the individual item scores relate significantly with each other and that they are internally consistent. On the contrary, if the value is low (< 0.7), this means that the items do not have internal consistency. After running the Cronbach’s Alpha, we found that for Attitude and Self-Efficacy variables, the values were higher than 0.7. This means that the items were internally consistent. The table below shows the values of the Cronbach’s Alpha for the two variables.

TABLE 3: Reliability and Validity Test.

No	Variables	Cronbach’s Alpha	No. of Items
1	Attitude	.823	11
2	Self-Efficacy	.881	7

As we can see from Table 3, the value of the Cronbach’s Alpha was .823 for Attitude variable and was .881 for Self-Efficacy variable. This means that all items for those two variables are reliable and consistent since the values are > 0.7 .

As we can see from Table 4, only two H1 and H5 were accepted. The results of the correlation data analysis show that technology literacy and attitude positively affect lecturers’ intention to use e-learning. The results of partial correlation indicate that there was a positive correlation between technology literacy and the intention to use e-learning where $r(60)=.362$ and $p= 0.005$. The results also suggest that attitude had a moderate positive correlation with intention to use e-learning where $r(60)= .324$, and $p=0.11$. The other hypotheses were rejected.

TABLE 4: Correlation Matrix.

		TL	TCL	PE	A	SE	IUE
TL	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	60					
TCL	Pearson Correlation	.561**	1				
	Sig. (2-tailed)	.000					
	N	60	60				
PE	Pearson Correlation	.176	.271*	1			
	Sig. (2-tailed)	.179	.036				
	N	60	60	60			
A	Pearson Correlation	.221	.496**	.305*	1		
	Sig. (2-tailed)	.090	.000	.018			
	N	60	60	60	60		
SE	Pearson Correlation	.430**	.478**	.319*	.683**	1	
	Sig. (2-tailed)	.001	.000	.013	.000		
	N	60	60	60	60	60	
IUE	Pearson Correlation	.362**	.240	.092	.324*	.222	1
	Sig. (2-tailed)	.005	.065	.484	.011	.088	
	N	60	60	60	60	60	60

Note: TL = Technology Literacy, TCL = Technology Comfort Level, PE = Previous Experience, A = Attitude, SE = Self-Efficacy, IUE = Intention to Use E-Learning **. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

3.2. Discussion

In this study, only two of the proposed hypotheses were accepted. Technology literacy and attitudes towards e-learning positively correlate with the intention to use e-learning. These results corroborate previous studies (3)(6)(28-29). Lecturers' attitude towards technology may have changed significantly after the pandemic. Some research findings indicate that after the pandemic lecturers had more positive attitude when they saw positive learning outcome when using online learning or blended learning. Table 2 suggests that it can take a while for lecturers to figure out how to integrate e-learning to achieve the learning outcomes. After all, integrating technology in the classroom may not as easy as it seems and involve a lot more efforts in making it successful (2). Lecturers' attitude towards technology, in addition, is related to that of students. Many students will be more comfortable in using e-learning when their lecturers are also technologically savvy. Many studies found that self-efficacy influences the intention to use e-learning. However, this is not the case in this study. Self-efficacy does not have correlation with the intention to use e-learning. This might be due

to the fact that lecturers have improved their technology-related skills. During the pandemic, lecturers had to switch quickly to online mode of teaching. Those who are reluctant to use e-learning had to learn new applications to conduct online classes. Universities had to encourage and support lecturers to use their learning management system. In Indonesia, unlike K12 schools, most universities are located in regencies or municipalities where university lecturers have better access to the Internet. Thus, better connection to the Internet, good facilities and infrastructure might have an impact on lecturers' perceived ability to complete technology-related tasks. The results of the descriptive statistics of attitude implies that lecturers have positive attitude towards e-learning because they recognize the importance of technology adaptability of young generation nowadays. During the pandemic, it is evident that external factors are often become the strongest drivers and triggers to make changes, especially in teaching paradigms. As shown in Table 3, lecturers felt more confident with their ability to navigate the e-learning and utilized various applications, but less convinced with their ability to redesign their class activities to integrate technology so that students are encouraged to become knowledge producers. Technology integration in the classrooms can be based on behaviorism, cognitivism, or constructivism approaches. Understanding these teaching paradigms and how they affect technology adoption is crucial for any lecturers (2). Constructivist model, for instance, might be the most appropriate model to foster creativity and analytical thinking skills since this model emphasizes students' multiple and distributed intelligence and utilizes problem-solving activities.

The results of this study emphasized other highlights on lecturers' experiences with e-learning and with technology in general. The statistical analysis indicates that lecturers' intention to use technology does not depend on how comfortable they are in using technology and their previous experience in using e-learning. These results are in line with those of the previous studies on e-learning (3)(20). This study does not examine in detail what experience the respondents had. Thus, this might be an area that needs to be explored further.

In the United States, there are two standards lecturers and students have to adopt to prepare them for the 21st-century skills, especially in dealing with issues in new technologies. They are the National Educational Technology Standards (NETS) created by International Society in Technology in Education (ISTE) and the Information and Communications Technology (ICT) Competency Standards for Teachers which are created by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) (2). In Indonesia, such standards are critically needed to help guide teachers when use technology meaningfully. These standards will be useful for them to redesign and

manage their lesson plan, to assess students learning outcomes and technology literacy. For students, such standards will guide them in utilizing technology appropriately for their learning management and in understanding the social, ethical, legal, and human issues associated with technology use.

4. Conclusion

This study intends to look at correlates of the intention to use e-learning. Specifically, this study examines the effect of technology literacy, technology comfort level, previous experience with learning, self-efficacy, and attitude on the intention to use e-learning. From the data analysis, only two variables, technology literacy and attitude, positively affect lecturers' intention to use e-learning. The results of this study suggest that the more confident the university lecturers were about their technology-related skills and the more positive attitudes they had towards e-learning, the more likely they were in using e-learning. The findings also indicate that university lecturers were increasingly more confident with their ability in tackling technology-related issues, but less certain how e-learning helps them empower students to become content creators.

The findings emphasize several key issues that universities in Indonesia have to address. First, lecturers are more comfortable in using the learning management system and online applications to teach students. However, to use them more effectively and efficiently, universities should provide pedagogical trainings and workshops on e-learning and technology adoption. Such trainings will be beneficial for lecturers to revamp and redesign their courses, modify teaching activities so that students are able to create and share contents and knowledge.

Future research on the intention to use e-learning can examine other factors, especially external factors such as institutional policies or governmental policies, or other external factors that may account for the intention to use e-learning and which are still understudied. This study is quantitative in nature and does not delve deeper into the reasons why lecturers were less confident of the e-learning role in empowering students. Future research on the intention to use e-learning can explore this phenomenon more elaborately.

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