The Role of Technology Acceptance Model (TAM) in Improving Learning Performance: Study at Maritime Vocational High School in Central Java

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Abstract. The role of technology in the learning process in the current era is crucial to be used in enrichment and student learning experiences. Students use the learning process through the use of technology to obtain the expected competencies. Teachers as facilitators use CBT as a tool in facilitating the learning process. In the process, the problem that arises is the acceptance of students' perceptions or CBT technology. This study aims to examine the effect of the technology acceptance model (TAM) model on the learning performance of maritime vocational high school students. The study used a quantitative approach by using SEM-PLS in testing the data that had been obtained. This study involved 79 maritime vocational high school students from Central Java province. The results showed that there was an effect of perceived usefulness on behavioral intention and direct learning performance. In addition, perceived usefulness affects learning performance through behavioral intention, meaning that behavioral intention partially mediates perceived usefulness on learning performance. This study examines perceived ease of use on behavioral intention and learning performance. The results showed that it had a direct effect on behavioral intention but did not have a direct effect on learning performance. The study results indicate a role for the behavioral intention in mediating the total effect on learning performance.

Key words: TAM; perceived usefulness; perceived ease of use; behavioral intention; learning performance.

How to Cite: Palapa, A., Fakhruddin, F., Prajanti, S.D.W., Raharjo, T.J (2021). The Role of Technology Acceptance Model (TAM) in Improving Learning Performance: Study at Maritime Vocational High School in Central Java. *ISET: International Conference on Science, Education and Technology*, *7*(1), 958-963.

INTRODUCTION

The learning process is carried out conventionally in the current era, namely face-to-face between teachers and students. Still, the learning process is carried out through various variations that can provide new experiences to students in the learning process (Chuttur, 2009). The learning process goes through various variations, including e-learning, computer-based training (CBT), or flip classroom, and various other variations (King & He, 2006; Sun & Rueda, 2012). The learning process using variations is expected to provide experience and convenience in the learning process. Students do not only read and answer questions from the teacher but the learning process can be carried out with various methods that prioritize learning experiences and increase the expected competence. The learning process goes through a series of stages emphasizing affective, cognitive, and psychomotor aspects (Al-Emran et al., 2018). Previous research has not discussed many aspects of TAM that are associated with learning performance. Acceptance of technology is one indicator that students can accept variations in learning. When students cannot accept the learning process, there is poor learning performance. Therefore, the learning process needs to be carried out carefully to decide on the appropriate variety of learning for students to improve their competence. Previous research has focused more on the use of TAM in the learning process (Nagy, 2018), so it is less able to accurately measure its effect on learning evaluation as measured by student learning performance. This study tries to examine the effect of TAM on learning performance. The use of CBT is one of the steps taken to improve student competence (Yuliana & Suhaimah, 2019). CBT is a sophisticated tool and can be used to understand the materials that have been tested so that students can improve their competence through familiarization with these questions (Astrida et al., 2018).

Research on TAM in the process of using learning by applying the CBT method, based on previous research mapping, previous researchers have not been widely explored, so there is still a need for testing of learning performance based on CBT learning media. One step that needs to be done is to provide training to students in its use. Several previous studies have not discussed much the learning process using CBT media. Previous research has focused more on the use of TAM by applying it to learning media that use technology

such as learning management systems and use with social media. The use of CBT is one step to improve student competence,

Technology Acceptance Model (TAM) adopted from the Theory of Reasoned Action (TRA) as fundamental knowledge of student behavior in using leaning technology. The TAM model explains the behavior of information technology users by looking from the perspective of students' beliefs, attitudes, interests, and behavioral relationships in the use of CBT. This model aims to explain the main factors of the behavior of users of information technology in the field of education towards the acceptance of the use of information technology (Lu et al., 2003; King & He, 2006; Nagy, 2018; Estriegana et al., 2019). The expansion of the Technology Acceptance Model (TAM) concept is expected to assist in predicting a person's attitude and acceptance of technology. It can provide the necessary basic information regarding the factors that drive individual attitudes. The technology acceptance model theorizes that a person's intention to use a system or technology is determined by two factors, namely perceived usefulness and perceived ease of use. Perceived usefulness is defined as the degree to which a person believes that using technology will improve performance (Yuliana & Suhaimah, 2019).

Perceived ease of use, which is defined as the degree to which a person believes that using technology will make himself free of effort or easier in completing a job (Zhai et al., 2019). The technology acceptance model is the most influential model to see the acceptance of information systems. The technology acceptance model believes that the use of information systems will improve the performance of individuals or companies, and the use of these information systems will make it easier for users to complete a job. With two main determining factors, namely the perception of usefulness and convenience, the technology acceptance model is expected to explain the acceptance of information system users towards the information system itself. The development of the world of sustainable education raises the need to continue studies on the use of information technology in the learning process (Manis & Choi, 2019). Research on the factors that predict the acceptance of information technology receives a lot of attention because many schools adopt and use information technology. The technology acceptance model is one model that can be used to investigate this. TAM is developed from theory psychology to analyze behavior.

Hypothesis Development

Influence Perceived ease of use on Behavioral Intention and Learning Performance

Perceived ease of use is a level of confidence in using a technology that will improve learning performance. When students believe that CBT can improve the learning process, their perceptions will be higher, and vice versa. When students believe that the learning process will be less valuable by using CBT, their perceptions will be lower. Previous research has shown that perceived usefulness has a positive effect on the intention to use CBT (Astrida et al., 2018). The use of technology will increase students' ability to explore a problem so that, especially in shipping vocational schools, a process is needed to improve their respective competencies. The use of CBT is a crucial step to improve competence, especially in the psychomotor aspect, to study the material and exam questions (Yuliana & Suhaimah, 2019). Through the learning process using CBT, the process prioritizes the existence of a habit for students to answer the questions to be tested and the learning process that can be monitored by the teacher so that the learning process can be carried out effectively. When students feel that CBT can be helpful, it will encourage more intense use, meaning that students can often use the learning media so that there is an interaction and habituation to use the application regularly (Zhai et al., 2019). The process of using the application is a step to improve the competence of students. Previous research stated that there is a positive influence between perceived usefulness on the intention to use CBT. In addition, there is a positive influence between CBT and learning performance; therefore, the use of applications that are considered easy will encourage knowledge transfer and increase understanding of competencies, which will ultimately build an understanding that will encourage increased learning performance (Nagy, 2018). The intensity of use and interaction between users and the system can also indicate ease of use. The system used more often indicates that the system is easier to understand, easier to operate, and easier to use.

H1: Perceived ease of use influence behavioral intention
H2: Perceived ease of use influence learning performance

H3: Perceived ease of use influence learning performance through behavioral intention

Perceived usefulness is defined as the degree to which a person believes that the use of a particular subject will be able to improve that person's work performance. Perceived usefulness) is a person's level of trust in using a particular subject that can provide benefits for the person who uses it (Sagnier et al., 2020). Perceived usefulness is the construction of a person's belief that the use of a particular technology will improve their performance. From these two definitions, it can be concluded that the perceived usefulness of the system is related to the productivity and effectiveness of the system. Perceived usefulness is the general use of the task to improve people who use the system. There is an essential effect of benefit in understanding individual responses in information technology (Scherer et al., 2019).

The behavior of students' intentions towards products and services results from the process of satisfaction felt by students with products and services provided by providers of products and services. The satisfaction felt by students towards the products and services provided can influence the behavior of high or low student intentions depending on how much satisfaction students feel (Rafique et al., 2020). Understanding student behavior will facilitate management to develop products or services according to the needs and desires of students. The desire for student behavior is often based on the possibility of action to be taken. Behavioral intention is a student's desire to behave in a certain way to own, dispose of and use a product or service so that students can form a desire to seek information.

H1: Perceived usefulness influence behavioral intention
H2: Perceived usefulness influence learning performance
H3: Perceived usefulness influence learning performance through behavioral intention

METHODS

This research was conducted using a quantitative approach. Data obtained through the distribution of questionnaires obtained 79 students who became respondents in this study. The data obtained, then tested using SEM-PLS to determine the effect between variables.

RESULTS AND DISCUSSION

Based on validity test, the result represented in Table 1

Table 1. Validity Test Result

Variable	Indicator	Behavioral Intention	Learning Performance	Perceived Ease of Use	Perceived Usefulness
Perceived Usefulness	PU1	0.631	0.670	0.697	0.906
	PU2	0.679	0.774	0.750	0.917
	PU3	0.669	0.691	0.738	0.883
Perceived Ease of Use	PEU1	0.698	0.682	0.889	0.684
	PEU2	0.630	0.631	0.893	0.763
	PEU3	0.646	0.717	0.874	0.703
Behavioral Intention	BI1	0.899	0.730	0.683	0.592
	BI2	0.932	0.711	0.693	0.702
	BI3	0.942	0.833	0.690	0.731
Learning Performance	LP1	0.767	0.883	0.678	0.686
	LP2	0.785	0.907	0.652	0.717
	LP3	0.617	0.860	0.703	0.693

Table 2, show reliability test result

Table 2. Reliability Test Result

Variable	Cronbach Alpha	Composite Reliability
Behavioral Intention	0.915	0.946
Learning Performance	0.859	0.929
Perceived Ease of Use	0.862	0.916
Perceived Usefulness	0.886	0.914

There are direct effect and indirect effect as show in Table 3 and Table 4

Table 3. Direct Effect Result

	Standart Deviation	T Statistic	P Values
BI_LP	0.134	3.535	0.000
PEU_BI	0.145	3.030	0.003
PEU_LP	0.112	1.397	0.163
PU_BI	0.139	2.711	0.007
PU_LP	0.110	2.874	0.004

Table 4. Indirect Effect Result

	Standart Deviation	T Statistic	P Values
PEU_LP	0.090	2.321	0.021
PU_LP	0.089	1.991	0.047

Note: Behavioral Intention (BI), Learning Performance (LP), Perceived Ease of Use (PEU), Perceived Usefulness (PU)

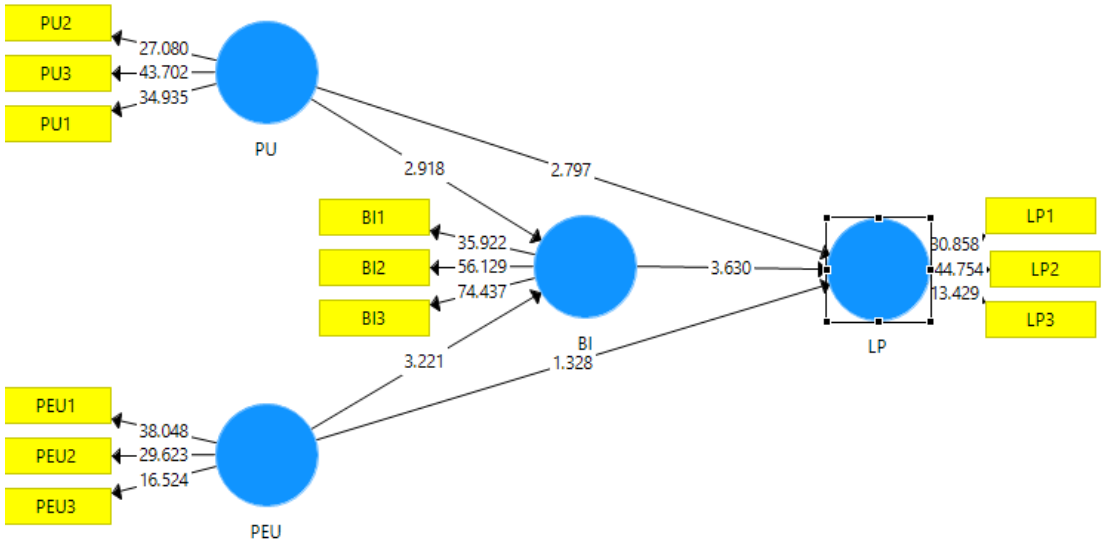

Figure 1. Research Framework

The results showed that there was an effect of perceived usefulness on the use of CBT directly. Research results show that students have an important role in perceiving the benefits received during CBT. When used, it will encourage the development of behavior to use learning technology. The process of involving technology is shown with significant results. Useful technology will provide a positive perception for students who use CBT to create for students in the learning process in the learning process (Zhai et al., 2019). The learning process using technology encourages the acquisition of better competencies. Hence, when there is a positive perception of CBT technology, it will encourage students to improve the learning process. There is learning performance achieved based on the research process. The study results support previous research, which shows that a positive impact on learning performance as a result of the use of technology, especially CBT (Astrida et al., 2018). The results of this study confirm previous research that behavioral intention is positively influenced by perceived usefulness (Nugroho et al., 2018). The results of the study confirm that intention mediates the role of perception on learning performance. The study results support previous research, which shows that positive learning performance is created due to the use of technology, especially CBT. The results of this study confirm previous research that behavioral intention is positively influenced by perceived usefulness. The results of the study confirm that intention mediates the role of perception on learning performance. The study results support previous research, which shows that positive learning performance is created due to the use of technology, especially CBT (Surendran, 2012). The results of this study confirm previous research that behavioral intention is positively influenced by perceived usefulness. The results of the study confirm that intention mediates the role of perception on learning performance.

The results show that the ease of using technology has an important role, especially in CBT to be utilized in the learning process. When technology can be operated easily, it can encourage students to follow the learning process more effectively and efficiently (Yuliana & Suhaimah, 2019). The face-to-face meeting is a conventional learning process. Therefore, it prioritizes discussion and delivering material delivered by the teacher to provide knowledge to students. Still, in the learning process, by prioritizing technology, an increase in experience can be created. In the process, not only do students get knowledge but also gain learning experiences. Variations in the learning process that are easy for students to use will encourage a more straightforward experience process so that

the experience can increase the expected competencies following the learning objectives (Rahimi et al., 2018; Salloum et al., 2019). Creating technology that is tailored to the needs of students in the learning process and facilitates its use will sustainably encourage continuous use. The results of this study prove that perceived ease of use will encourage the creation of behavioral intention. This study proves that the conveniences created by technology will have a positive influence on their sustainable use. The results of this study strengthen previous research, which shows that there is a positive influence between perceived ease of use on behavioral intention. This study confirms that perceived ease of use does not directly affect learning performance but is mediated by behavioral intention. This study confirms that intention is a fully mediating variable between perceived ease of use and learning performance.

CONCLUSION

This study examines the effect of perceived usefulness and perceived ease of use on learning performance through behavioral intention. The results showed that perceived ease of use did not directly affect learning performance but also behavioral intention. Research results show that the use of technology is easy to operate first through continuous use to determine learning success. This study confirms that there is a direct or indirect effect between perceived usefulness on learning performance. The results of this study indicate that behavioral intention partially mediates the positive influence on learning performance. This study shows that the benefits received affect learning performance either through continuous use or not. This study strengthens previous research, which shows an influence between variables that encourage better learning performance.

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