

Open Access Article

Improving Actual E-Learning Usage: Evidence from Indonesia

Alwan Sri Kustono

Accounting Department, Faculty of Business and Economics, University of Jember, Jember, East Java, Indonesia

Abstract: This research project aims to determine the predicting factors that influence the successful use of e-learning in Indonesia, in particular, the utilization of e-learning as a learning model during the Covid-19 pandemic. The e-learning method is a learning model that does not require face-to-face contact, so it fits the physical distancing needs imposed to limit spread of the virus. The method of data collection here employed a survey approach, while testing relied on partial least squares using SmartPLS v3.3.2 software. The research sample was 357 accounting lecturers. Data were collected using Google Forms. The results showed that the success of e-learning was influenced by the ease of use of the platform. The ease of the e-learning platform is influenced by e-learning literacy and organizational support. In the path analysis, actual use is affected by intention, ease of use affects intention, and two exogenous variables affect the ease of use. Different from what was predicted, usefulness is not a primary factor for use. In pandemic conditions, lecturers tend to call on easy-to-use devices with emergency learning methods, even though their utility is not yet optimal. Higher education institutions can take advantage of research results to increase the success and achievement of learning outcomes. Lecturers and students increase e-learning adoption if supported by organizational policies and increased literacy related to e-learning. The uniqueness of this research relates to selecting initial antecedent variables that can be followed up with practical actions to increase the success of e-learning, thus providing scientific and practical novelty.

Keywords: e-learning outcome, e-learning literacy, organizational support, ease of use, usefulness, intention to usage, actual usage.

改善实际的电子学习使用率：来自印度尼西亚的证据

摘要：该研究项目旨在确定影响印度尼西亚电子学习成功使用的预测因素，尤其是影响新冠肺炎大流行期间将电子学习用作学习模型的因素。电子学习方法是一种不需要面对面接触的学习模型，因此可以满足限制病毒传播的物理距离需求。此处的数据收集方法采用了一种调查方法，而使用聪明 PLS v3.3.2 软件则依赖于偏最小二乘进行测试。研究样本为 357 名会计讲师。数据是使用谷歌表单收集的。结果表明，在线学习的成功受到平台易于使用的影响。电子学习平台的易用性受电子学习素养和组织支持的影响。在路径分析中，实际使用受意向影响，易用性影响意向，两个外生变量影响易用性。与预测的不同，有用性不是使用的主要因素。在大流行情况下，讲师倾向于使用带有紧急学习方法的易于使用的设备，即使其效用尚未达到最佳状态。高等教育机构可以利用研究成果来提高学习成果的成功率和成就。如果得到组织政策的支持和与电子学习有关的识字能力的提高，讲师和学生将增加电子学习的采用率。这项研究的独特性在于选择初始的前因变量，随后可以采取实际行动来提高电子学习的成功率，从而提供科学和实用的新颖性。

关键字：电子学习成果，电子学习素养，组织支持，易用性，有用性，使用意图，实际使用情况。

Received: 19 October 2020 / Revised: 20 November 2020 / Accepted: 23 December 2020 / Published: 29 January 2021

About the author: Dr. Alwan Sri Kustono, Accounting Department, Faculty of Business and Economics, University of Jember, Jember, East Java, Indonesia

Corresponding author Alwan Sri Kustono, alwan.s@unej.ac.id

1. Introduction

Along with the speed of information technology's development, e-learning has become an indispensable trend [1]. It satisfies modern society's academic requirements and creates a continuous learning demand from businesses and universities [2]. E-learning uses advanced technology that is different from conventional learning. Lecturers have different abilities and preferences regarding online-based learning. Lecturers are required to have information and communication technology expertise, and learning techniques must change to be information and communication technology (ICT) based. Teachers who have designed learning on an online basis usually have no issues [45]. However, it is different for lecturers who design their learning curricula using offline methods or class meetings.

Outcome-based education is a reference in determining the results of e-learning. This outcome is based on standards of knowledge, abilities and behavior. Learning outcomes are achieved through curriculum, methods, assessment and other learning methods. Changes in learning methods certainly have an impact on the planned learning outcome level. The sudden application of e-learning methods due to a pandemic presents a challenge with achieving student outcomes. That is, the learning process may not achieve the desired outcomes. At the extreme point, the learning process only completes the administration and is not outcome-oriented. The spread of the COVID-19 pandemic has prompted several countries to implement policies for physical distancing. This policy is followed by the work from home (WFH) recommendation. The impact of these policy universities in Indonesia applies e-learning learning methods. Although this method has long been implemented in tertiary institutions, its application is not mandatory. The COVID-19 pandemic has also forced universities in Indonesia to modify learning methods using e-learning. This policy is situational, thus, the supporting structures have not been prepared optimally. The university carries out academic activities online by preparing lecture materials, assignments, quizzes, forums or chat facilities.

2. Literature Review

[3] emphasizes that e-learning refers to the use of internet technology to deliver a series of solutions that can enhance knowledge and skills. The term e, or the abbreviation of electronics in e-learning, is used as a term for all technologies used to support teaching efforts through internet electronic technology. E-learning is an effort to build an educational pedagogy that makes it easy for students to improve their knowledge and skills online. The e-learning system implementation discussed here is used to meet the

needs of tertiary institutions. Its implementation is intended as an effort to distribute learning materials through electronic media or the internet. Students can access it anytime and anywhere. Many universities have implemented or begun e-learning, but they have lectures, and students have not fully utilized the application.

The application of an emergency method certainly does not provide maximum results. There are many obstacles, including that many lecturers still having to adjust to e-learning and inadequate infrastructure capacity due to internet signal, software, or other device constraints. Students also experience difficulties due to limited access and networks. The use of new technology has a different level of acceptance. The Technology Acceptance Model (TAM) was first introduced by [4], [5] and uses usefulness and ease of use to explain factors affecting individuals' intention and behavior when using and accepting specific technology. The TAM has been widely used to evaluate users' acceptance and explain users' behavior by assessing the impact of information on users regarding trust, attitudes, and intentions. Attitudes toward using certain this technology can be positive or negative. TAM illustrates the degree to which a person believes his or her performance increase when using technology.

[6] and [7], furthermore provide a framework for understanding the factors that may cause a new technology to be accepted and implemented. Certain factors influence the success of the implementation of new technologies. Davis [4] uses the basis of reasoned action theory to design the acceptance models.

Based on social cognitive theory (SCT), [7] proposed a model that refines Davis's model. Social cognitive theory provides a theoretical basis for describing behavioral and affective reactions to computational technology. Based on this framework, technology acceptance is influenced by individual factors and support from the environment, namely computer experience and organizational support. E-learning experience and organizational support are antecedent variables. From these obstacles, it is necessary to determine the factors influencing lecturers and students to take advantage of e-learning at universities in Indonesia. The model used to analyze technology acceptance is a technology acceptance model (TAM) and computer usage model.

This research is necessary because it discusses two points of view, first, with the existence of a Covid-19 pandemic. Universities in Indonesia have been forced to apply emergency e-learning, which impacts achieving learning outcomes. This study examines the achievement of the learning outcome. Second, changing the conventional method to online learning raises different levels of acceptance among lecturers.

This paper analyzed several factors that were thought to be related to the e-learning method's acceptance. The study results contribute to the discovery of exogenous variables the success of the acceptance of e-learning models. An understanding of exogenous variables can be used for entity policymaking when applying the e-learning model. This study provides an efficient alternative strategy to improve the quality of e-learning acceptance. The selection of the initial antecedent variables, namely e-learning literacy and organizational support, can be practically improvised.

2.1. E-Learning Literacy

Literacy in academic literature means the ability to read and write. The sense of developing further in the industrial era 4.0, literacy has skills and mastery of technology efficiently, both in hardware and software. The meaning of literacy has grown to include the ability to use information technology. Technology literacy is defined as knowing what technology is, how it works, what goals, and how technology can achieve specific goals.

In college, education is considered a service. Students are customers of e-learning services, so e-learning student loyalty will be regarded as customer loyalty. Following this definition, e-learning literacy can refer to a person's knowledge and skills regarding the use of e-learning applications. E-learning literacy is a collection of knowledge, skills, and attitudes to learning that requires mastery of computer hardware, software, and the internet.

Self-determination theory (SDT) argues that motivation arises from satisfying basic psychological needs. There are three psychological needs: competency, autonomy, and interconnectedness. SDT believes that individuals will choose goals, behavioral domains, and relationships that can satisfy psychological needs. Competence is the need to be able to master the tasks that are the responsibility of someone. Thinking competence impacts self-confidence. Competence is needed if there is a change in the environment [11]. Individual differences have a positive influence on the success of an information system.

Success can be seen from the use of the management information system itself. Individual differences are divided into three parts: cognitive styles; personality; and situational variables. Situational variables explain that literacy, in general, and knowledge in specific fields are believed to influence management information systems. Individuals who have high task knowledge and professionals tend to use information systems more because they feel they have no difficulty using online information systems.

Literacy is an internal controlling factor that can positively influence perceptions of ease of use. Literacy can help users to develop a deep understanding of what the lecturer wants. The ability of lecturers to use a

system efficiently affects the perception that the system is easy to use. Lecturers who are technologically literate are faster and more focused so that they do not experience difficulties. Literacy affects individual self-confidence. Khwarizmi revealed that literacy ability involves acquiring various information related to the effort to live life (competing). By having as much information as possible, form a confident individual. Literacy plays an important role in one's performance [12], [13].

Knowledge of e-learning tools is an internal factor that can influence the acceptance of online-based learning models. Experience helps users to provide adequate responses so that they can make more informed decisions. The e-learning application is expected to be able to do its job as desired by the user. The development of the ability to use computers will cause changes in the user's metaphor in viewing and interacting with computers [46]. The increase in online literacy affects other conditions. It is essential to study the influence of lectures' self-efficacy and student information literacy skills online learning. Literacy affects technology use, usefulness, and ease of use [14], [15]. Based on this, the first and second hypothesis is formulated:

H1: E-learning literacy has a positive effect on ease of e-learning use.

H2: E-learning literacy has a positive effect on the usefulness of e-learning.

2.2. Organizational Support

The perception of support from the organization is a crucial variable that can influence lecturers' attitudes in learning e-learning. One form of organizational support for lecturers is when the organization provides opportunities to carry out the process. The perception of how organizations implement support for the implementation affects lecturers' attitudes and behavior. The more excellent perception of the organization's support is expected to produce a more excellent affection perception. Perceived organizational support is the confidence of the organization's support contributions and cares about their well-being [16]. [17] stated three general forms of treatment from organizations considered good and can increase organizational support perceived by users, namely support, fairness, and rewards.

[7] said that organizational support facilitates or inhibits individuals from performing a behavior. This support is reflected in the ease of use of information systems and anticipating existing obstacles. Organizational support has two effects, namely directly affecting behavior and indirectly influencing behavior through the intention or intention of one's behavior. The more positive organizational support, the stronger the intention of individuals to bring up a behavior. Previous studies have shown organizational support [17]–[21].

H3: Organizational support has a positive effect on perceived e-learning ease of use.

H4: Organizational support has a positive effect on the usefulness of e-learning.

2.3. Ease of Use

Ease of use is defined as the extent to which someone believes that an information technology system is easy to understand and use. If someone feels that the system is easy to understand, learn, and operate, they will react positively to the system and use it. Conversely, if someone feels that the system cannot be understood, learned, and operated, they will not accept or use the technology system. The ease of use of information technology has some indicators, such as whether the technology is easy to learn and operate, can accomplish tasks easily as desired by users, and can quickly improve user skills.

In the concept of TAM, ease of use affects usefulness. Information technology systems are more useful if they are easy to use. Convenience is determined by ease of use in transactions and whether the application's features provide a service required by users. Customers will use an application service that has a greater number of benefits and enables convenient transactions [22]–[25]. Ease of use influences the attitudes of individuals in accepting new technology. If the individual feels the latest technology is easy to use and learn, users will be encouraged to use it.

A person's attitude towards using technology depends on his comfort with it; as his comfort increases, so too will his chances of using it. A higher level of comfort increases user convenience. This result has also been established by previous research [19], [26], [27].

H5: Ease of use has a positive effect on the usefulness of e-learning.

H6: Ease of use has a positive effect on the intention to use e-learning.

H7: Ease of use has a positive effect on actual e-learning usage.

2.4. Usefulness

Usefulness includes making work more comfortable, increasing productivity, enhancing effectiveness, and developing job performance. The TAM concept [28] states that usefulness influences one's attitude toward use. Usefulness is defined as the condition in which someone believes that using a system will be beneficial. The belief that a system will be useful will result in the system being used. Conversely, a system deemed useless will not be used. The concept illustrates using a technology system to increase productivity, performance, effectiveness, and overall usability.

Usefulness can also be defined as consumer confidence in obtaining a use or benefit, or the belief

that certain technologies can improve work performance. In the TAM model, ease of use and usefulness influence attitudes and intention to use [29], expressed beliefs about ease of use, and forming the intention to use. Thus, the greater the usefulness, the higher the intention to use information systems.

Perceived usefulness positively and significantly affects the use of information systems. Previous studies have also shown that, compared to other constructs, perceived benefits are the most significant and vital construct influencing attitudes, intentions, and behavior in using technology. Individuals will use a technology if the technology can benefit the user, even if the technology is challenging to use. An individual will use a technology if the technology has improved capabilities and helps the user do his work. It has been shown that usefulness affects an individual's intention to use technology [8], [30]. Other research results support this notion [15], [31], [32], finding a positive relationship between usefulness and intention to use.

A person's behavior is directly and significantly affected by intention. To increase the intention to adopt e-learning, the university must develop a positive attitude towards its students by increasing the benefits, convenience, security, and behavioral control of e-learning. Increasing intention to use e-learning will affect individual attitudes in the adoption of e-learning. The majority of individuals who accept the existence of new technology usually have the intention to use the latest technology.

The attitude toward using information technology systems can be interpreted as behavior that continuously uses information systems. Attitude is the basis for evaluating system acceptance and is supported by previously conducted research [24], [33], [34]. The proposed hypotheses are as follows:

H8: Usefulness has a positive effect on the intention to use e-learning.

H9: Usefulness has a positive effect on actual e-learning usage.

2.5. Intention to Use

One's exhibited behavior arises out of the intention to act. That person's intention influences others' behavior. Individual intention itself comes from an attitude of receptivity. The intention is a desire to behave in a particular way. One will act if they have the desire or intention to do so.

Intention to use is evidenced by the user's attention in applying technology and information systems, and includes both repeat users and new users. Assessment of the user's intention will also motivate other users to continue to use the technology and information systems. Perception of usability and perceived user convenience represent individual intention to use technology and information systems, leading to user responses.

Lecturers who have a strong desire to use e-learning will tend to utilize the facilities provided by e-learning, assuming that the information technology system provides benefits and can be easily used. This will affect the user's intention to use the new technology to implement its functionality. [33] found a positive relationship between an individual's intention to use and actual usage of new technology. Other research has also found the existence of a positive relationship between the two variables. Similar results were found by [35] and [36].

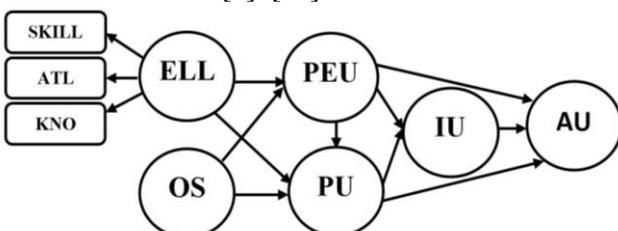
H10: Intention has a positive effect on actual e-learning usage.

3. Method and Materials

The research is a quantitative research approach. It was conducted with a survey approach using a questionnaire instrument to obtain data. The research population is accounting lecturers in Indonesia. The purposive sampling method is used to collect samples, use a Google Form, and disseminate it using WhatsApp media. The items on the research instrument were adapted from previous research with several modifications. The number of respondents who filled out the questionnaire was 357. Eleven respondents answered inconsistently, so they were excluded from further analysis. The data used were 346 respondents. Hypothesis testing uses the Partial Least Square method with SmartPLS version 3.3.2 software was used for hypothesis testing. PLS does not require normality distribution assumptions to be used for both small and large samples. The criteria used in this study are accounting lecturers in Indonesia who use e-learning in the teaching and learning process in the pandemic era.

The actual system usage is a condition of the whole system use [4]. Fig. 1 shows the research framework. It can be seen from the actual needs of using an information system, including those relating to the number of system users both the number of users who have done it repeatedly. Real users (actual system usage) also have satisfaction from users in using all the application features.

The availability of the required features will affect the lecturers in applying the system, which can be seen from the technology's quantity and quality. Someone will feel satisfied using the system if they believe that it is easy to use and will increase productivity, reflected in actual conditions [8]–[10].



ELL: e-learning literacy; OS: organizational support; PEU: ease of use; PU: usefulness; IU: intention; AU: actual usage

Fig. 1 The framework of antecedent actual usage

The actual usage relates to the design and creation of materials from scratch designed for e-learning. The material must be available and accessible, regardless of place and time. The minimum material is available in electronic presentations (for example power points). The delivery of the material must be under the learning program that has been planned. The e-learning model should interact between lecturers and students, students and students in the learning process, students' independence in finding reference sources to strengthen the material, and active discussion in the learning process synchronously.

4. Results and Discussion

4.1. Validity and Reliability Test Results

Table 1 shows that the indicator of e-learning literacy has a composite reliability value of 0.9468-0.9519. This variable's composite reliability value is greater than the cut-off value of 0.7, so the indicators have good internal consistency. Indicator variables are valid for measuring latent variables in literacy.

Table 1 Factor structure matrix of loadings and cross-loadings

Scale Items	E-Learning Literacy
Skill	0.9506
Attitude to learn	0.9468
Knowledge	0.9519

The test results showed a Cronbach alpha value of 0.93. The questionnaire used to collect data fulfills the reliability requirements.

4.2. Result

Hypothesis testing in this study was done by looking at the t-value. The results of the hypothesis testing are shown in Table 2.

Table 2 Hypothesis testing results

	Original Sample	Standard Deviation	T Statistic	P Values
ELL→PEU	0.84	0.03	30.29	0.00**
ELL→PU	0.15	0,05	3.20	0.00**
OS →PEU	0.42	0.40	0.16	0.00**
OS→PU	0.02	0.04	0.52	0.61
PEU→PU	0.86	0.04	19.87	0.00**
PEU→IU	0.84	0.04	4.21	0.00**
PEU→AU	0.03	0.41	0.07	0.64
PU→IU	0.12	0.46	0.26	0.80
PU→AU	0.33	0.36	0.93	0.35
IU→AU	0.68	0.13	5.15	0.00**

ELL: e-learning literacy; OS: organizational support; PEU: ease of use; PU: usefulness; IU: intention; AU: actual usage

Based on Table 2, the test results show that e-learning literacy, organizational support, ease of use, usefulness, intention to use, and actual usages are as follows. Variable e-learning literacy test results on the

ease of use with a path coefficient of 0.84. A probability level of 0.00 states that e-learning literacy influences the ease of use. The e-learning literacy on the usefulness with a path coefficient of 0.15 and a probability level of 0.00 shows that e-learning literacy affects the usefulness. Hypotheses 1 and 2 are accepted.

The results of testing organizational support on ease of use with a path coefficient of 0.02 and a probability level of 0.60 states that organizational support affects the ease of use variable. The testing result shows the organizational support on the usefulness with a path coefficient of 0.02 and a probability level of 0.61. It means the variable does not influence the usefulness. Hypothesis 3 and 4 are rejected.

The ease of use's test results on usefulness shows a path coefficient of 0.86 and a probability level of 0.00. Hence, it states that the ease of use influences the variable usefulness. Variable ease of use on the intention to use has a path coefficient of 0.84 and a probability level of 0.00. It means that the variable affects the intention to use. The ease of use on actual usage shows a path coefficient of 0.03, and a probability level of 0.61 states that the variable has no effect and is significant on actual usage. Hypothesis 5 and 6 are accepted but not in line with expectation, and hypothesis 7 is rejected.

Table 2 shows the usefulness effects on intention to use with a path coefficient of 0.12 and a probability level of 0.80. The usefulness does not affect intention to use. The usefulness influence actual usage with a path coefficient of 0.33 and a probability level of 0.35. It can be concluded that the variable does not affect actual usage. Hypothesis 8 and 9 are rejected.

The intention to use on actual usage with a path coefficient of 0.68. A probability level of 0.00. The result indicates the intention to use an effect on actual usage. Hypothesis 10 is accepted.

4.3. Discussion

E-learning is more useful if it has a convenience factor in its use. If the individual feels the technology is easy to use and learn, it will encourage users to use the new technology. The easier it is to use it, the lecturer feels the benefits. Lecturers who find it easy to use can use the advantages of e-learning. The effectiveness of e-learning methods is very dependent on the role of students and lecturers involved in it. These roles are reflected by stimulus patterns and responses in a discussion between lecturers and students. Active interaction between students and lecturers provides an opportunity to initiate questions and find answers independently. The test results show that the optimal implementation of e-learning can improve outcomes. The effectiveness of learning outcomes that are used depends on the role of students and lecturers involved. These roles are reflected in active interaction between

students and lecturers. Students are allowed to initiate questions and find answers independently.

E-learning literacy has a positive effect on ease of use and usefulness. Computer literacy, which consists of skills, learning attitudes, and knowledge, is an important variable in a successful e-learning method. It suggests that these elements influence use through other endogenous mediator variables. Though not directly affecting usage, e-learning literacy directly affects the ease of use and usefulness variables.

Literacy of e-learning applications and devices is an internal factor that can affect online-based learning models' acceptance. Knowledge helps users effectively respond so they can make more informed decisions. This e-learning application is expected to be able to carry out its duties according to the user's wishes. The development of the ability to use e-learning will lead to changes in the user's methods of viewing and interacting with the application. The increase in online literacy affects other conditions. This result aligns with the other results [15, 20, 37].

Based on the test, the results show the influence of organizational support on other variables. Organizational support indicates a positive impact on the ease of use. Organizational support does not directly affect usefulness. These results also show that organizational support affects actual usage through the ease-of-use variable. Ease of use is an essential variable in the relationship between organizational support and actual usage in the online-learning model. These results also show that intention indicates a variable that mediates the relationship between organizational support toward the actual use of the e-learning model.

The learning process with organizational support affects lecturers' perceptions of the convenience obtained when using e-learning compared to the perceived obstacles. Logically, the greater the organizational support that is provided and the fewer obstacles that are faced, the stronger a person's interest in certain behaviors will be. This result confirms previous studies showing the influence of organizational support [21, 38, 39]. The more positive the organizational support, the easier it will be to carry out its duties [40]. Someone who has high e-learning literacy has low anxiety and feels the platform is easy to use.

Perceived ease of use affects usefulness and intention to use. The effect shown by the regression coefficient is positive, meaning that the higher the ease of use, the higher the usefulness. The ease of use describes the degree to which a person trusts that an information technology system will require minimal physical and mental effort. A system that is easy to use will facilitate and provide benefits for users. If the lecturer perceives a high ease of use, the perceived usefulness will also be increased. Lecturers who believe that e-learning is easy to understand and use will react positively to this method. E-learning is more

useful if it has the factor of ease of use. If individuals feel that the technology is easy to use and learn, it will encourage users to use the new technology. Lecturers will be interested in using e-learning technology if the technology is easy to implement. If that individual thinks that a technology has capabilities, they will be interested in using it. These results are aligned with previous research [41–44].

The surprising finding was that perceived usefulness did not influence intention and use. In theory, if a method or technology were of use to its users, it would be used to complete a task. If this technology has better capabilities and can help work, users will be interested in using it. The absence of the influence of the perceived usefulness variable on intention and actual usage may be because e-learning methods are the only possible teaching methods during a pandemic. Lecturers have no choice but to use distance learning methods because physical distance is currently crucial. The results of this study are different from others, which state that usability affects an interest in using technology [15], [32]. Other researchers have found a positive relationship between perceived usefulness and behavioral intention.

The results showed that intention to use had a statistically positive effect on actual system usage. Lecturer behavior in teaching is influenced by intention. If the e-learning model is easy to use, it affects the user's intention to use it to implement their activities. Individuals perform a behavior because they have the intention or desire to do so [9], [34]–[36].

The studies found a positive relationship between an individual's intention to use and the actual usage of technology. It shows that lecturers who intend to use the e-learning model most likely use it to the fullest. The learning model is made interactive by involving both students and lecturers. The degree of lecturers' intention to use e-learning models affects the level of use. An emergency e-learning model developed because of the coronavirus outbreak must be viewed differently from normal conditions. Electronic learning designed from scratch is on a different level than the emergency electronic learning model.

It can be argued that lecturers with specific methods can encourage students to achieve good learning outcomes. The e-learning method is an effective alternative during a pandemic if it is well-planned. Achievement of learning outcomes may vary depending on the lesson planning carried out. The test results show that the optimal application of e-learning can improve learning outcomes. The effectiveness of the e-learning method depends on the roles of the students and lecturers involved in it. This role reflects the stimulus and response patterns in question-and-answer activities between lecturers and students.

The effectiveness of the e-learning method used depends on the roles of the students and lecturers involved in it. These roles reflect the active interaction

between students and lecturers. Students are allowed to initiate questions and seek answers independently. E-learning can make it easier for students to increase their knowledge and skills and even improve their attitudes toward the learning environment.

These results can be used for consideration when e-learning is initially applied. This conclusion is universal because it focuses on individuals' attitudes when encountering new technology.

5. Conclusion

Based on data analysis and discussion of the influence of endogenous variables, the use of platforms significantly affects e-learning. Institutions need to find antecedent options so that e-learning meets the expected objectives. In this context, this study succeeded in showing two variables, namely organizational support and e-learning literacy. Lecturers and students who had high levels of e-learning literacy found this platform easy to use.

The tests found a pathway that determines the actual use of e-learning. E-learning literacy and organizational support are variables that determine the level of use of e-learning methods. The latter affects the ease of use, intention, and outcome in actual use. However, ease of use has no direct effect on actual usage. The test results showed that of the ten hypotheses, 1, 2, 3, 5, 6, and 10 were successfully accepted.

Both of these variables must be managed appropriately so that the e-learning process can get the best results. E-learning literacy and organizational support influence usage. The success of e-learning is very much in the use of specialized platforms. This enables lecturers to operate the features provided by e-learning application services. Literacy means expertise in handling an e-learning program. Among them are (1) the level of capability expected for implementing e-learning, (2) the ability to complete assignments well, and (3) competence in using e-learning software packages that affect the interaction between lecturers and students.

In accordance with the prediction that utility is not an antecedent of use, there were no relationship paths through the usefulness variable. Hypotheses 4, 7, 8, and 9 were rejected. In pandemic conditions, lecturers tend to use easy-to-use devices with emergency e-learning methods, even though their utility is not yet optimal. Lecturers' choices of e-learning platform are due to their having limited time to prepare, according to the learning objectives. Lecturers do not have enough time to select and compare platforms, so their choice tends to be the most obvious.

5.1. Limitations

This research was conducted during the COVID-19 pandemic on multiple respondents' e-learning literacy. Future research should categorize the respondents so that the results are more accurate.

This study's results cannot be applied to the condition that the respondent has competent e-learning literacy. The research objective was to find effective strategies for increasing the success of e-learning, so it was aimed at finding existing variables that could be improved.

References

- [1] SUN P.-C., TSAI R. J., FINGER G., CHEN Y.-Y., and YEH D. What drives successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*, 2008, 50(4): 1183-1202. <https://doi.org/10.1016/j.compedu.2006.11.007>
- [2] WU J. H., TENNYSON R. D., and HSIA T. L. A study of student satisfaction in a blended e-learning system environment. *Computers and Education*, 2010, 55(1): 155-164. <https://doi.org/10.1016/j.compedu.2009.12.012>
- [3] ADEWOLE-ODISHA E. An attitude of students towards e-learning in South-West Nigerian Universities: An application of Technology Acceptance Model. *Library Philosophy and Practice*, 2014, 1. <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=2504&context=libphilprac>
- [4] DAVIS F. D. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 1989, 13(3): 319-140. <https://doi.org/10.2307/249008>
- [5] LE O. T. T. and CAO Q. M. Examining the Technology Acceptance Model using cloud-based accounting software of Vietnamese enterprises. *Management Science Letters*, 2020, 10(12): 2781-2788. <https://doi.org/10.5267/j.msl.2020.4.032>
- [6] DAVIS F., BAGOZZI R. P., and WARSHAW P. R. User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 1989, 35(8): 982-1003. <https://doi.org/10.1088/2058-7058/30/1/43>
- [7] IGBARIA M. and IIVARI J. The effects of self-efficacy on computer usage. *Omega*, 1995, 23(6): 587-605. [https://doi.org/10.1016/0305-0483\(95\)00035-6](https://doi.org/10.1016/0305-0483(95)00035-6)
- [8] KUSTONO A. S. and VALENCIA Z. G. How the effectiveness of knowledge sharing affects enterprise resource-planning system case in East Java—Indonesia. *Advanced Science Letters*, 2017, 23(5): 4295-4297. <https://doi.org/10.1166/asl.2017.8263>
- [9] KUSTONO A. S., NANGGALA A. Y. A., and MAS'UD I. Determinants of the use of e-wallet for transaction payment among college students. *Journal of Economics, Business, & Accountancy Ventura*, 2020, 23(1): 85-95. <https://doi.org/10.14414/jebav.v23i1.2245>
- [10] SANTIKA I. W. and YADNYA I. P. Analysis of the Technology Acceptance Model of the use of e-commerce in handicraft SMEs in Gianyar. *Proceeding Seminar Nasional AIMI*, 2017, pp. 255-264.
- [11] LEE J.-W., & MENDLINGER S. Perceived self-efficacy and its effect on online learning acceptance and student satisfaction. *Journal of Service Science and Management*, 2011, 4(3): 243-252. <https://doi.org/10.4236/jssm.2011.43029>
- [12] MANSYUR M., RAHAMMA T., and FATIMA J. M. Students' visual media literacy skills and the success of learning information and communication technology (ICT) at SMP Negeri 11 Pare-Pare. *Jurnal Komunikasi KAREBA*, 2013, 2(4): 379-385. <https://media.neliti.com/media/publications/96455-ID-kemampuan-literasi-media-visual-siswa-da.pdf>
- [13] DWIUTAMI L., & WARDI T. D. Self-efficacy and information literacy ability in high school teachers. *Journal of Research and Measurement in Psychology*, 2015, 4(2): 65-73. <https://doi.org/10.21009/jppp.042.04>
- [14] SAADE R. G., NEBEBE F., and TAN W. Viability of the Technology Acceptance Model in multimedia learning environments: a comparative study. *Interdisciplinary Journal of e-Skills and Lifelong Learning*, 2007, 3: 175-184. <https://doi.org/10.28945/392>
- [15] AL-AZAWEI A., & LUNDQVIST K. Learner differences in perceived satisfaction of online learning: an extension to the Technology Acceptance Model in an Arabic sample. *Electronic Journal of e-Learning*, 2015, 13(5): 408-426. <https://academic-publishing.org/index.php/ejel/article/view/1942>
- [16] HAFFAR M., AL-KARAGHOULI W., DJEBARNI R., and GBADAMOSI G. Organisational culture, and TQM implementation: investigating the mediating influences of multidimensional employee readiness for change. *Total Quality Management and Business Excellence*, 2019, 30(11-12): 1367-1388. <https://doi.org/10.1080/14783363.2017.1369352>
- [17] FATDINA. The role of organizational support perceived by employees as a mediator of procedural justice's effect on organizational citizenship behavior. *Jurnal Psikologi*, 2009, 36(1): 1-17. <https://jurnal.ugm.ac.id/jpsi/article/view/7901>
- [18] HANDAYANI R. Analysis of factors affecting acceptance of the use of personal computers with the Technology Acceptance Model. *Jurnal Riset Manajemen dan Akuntansi*, 2010, 1: 55-66.
- [19] AL KURDI B., ALSHURIDEH M., SALLOUM S. A., OBEIDAT Z. M., and AL-DWEERI R. M. An Empirical Investigation into examining factors influencing university students' behavior towards e-learning acceptance using SEM approach. *International Journal of Interactive Mobile Technologies*, 2020, 14(2): 19-41. <https://doi.org/10.3991/ijim.v14i02.11115>
- [20] LEGOWO N., ABDURAHMAN E., HERWIDIANA K. I., and BUDIASTUTI D. The influence of instructor readiness, its capability, support of LMS Content, and their implications on e-learning effectiveness in a corporate university of BUMN. *International Journal of Recent Technology and Engineering*, 2019, 8(3): 54-59. <https://doi.org/10.35940/ijrte.C3875.098319>
- [21] AL-HADI S. The influences of government support in accepting the information technology in public organization culture. *International Journal of Business and Social Science*, 2014, 5(5): 118-124. <http://ijbssnet.com/journal/index/2476>
- [22] FIYAH N., MAYANGKY N. A., HADIANTI S., and RIANA D. Analysis of Technology Acceptance Model in Electronic Trading Platform Applications Among Students. *Jurnal Teknik Informatika*, 2019, 12(1): 59-68. <https://doi.org/10.15408/jti.v12i1.10507>
- [23] ANDARWATI M., & JATMIKA D. Analysis of the effect of the quality of accounting information systems on technology acceptance in the same sector using the TAM model approach. *Seminar Nasional Sistem Informasi*, 2017.
- [24] CHEN S. C., LI S.-H., and LI C.-Y. Recent related research in technology Acceptance Model: a literature review. *Australian Journal of Business and Management*

- Research*, 2011, 1(9): 124–127. <https://doi.org/10.16194/j.cnki.31-1059/g4.2011.07.016>
- [25] NANGGALA A. Y. A. Use of fintech for payment: an approach to Technology Acceptance Model Modified. *Journal of Contemporary Information Technology, Management, and Accounting*, 2020, 1(1): 1–8. <http://journal.p2ai.or.id/index.php/JCITMA/article/view/6>
- [26] TAJUDEEN S. A., BASHA M. K., MICHAEL F. O., and MUKTHAR A. L. Determinant of mobile devices acceptance for learning among students in developing country. *Malaysia Online Journal of Educational Technology*, 2013, 1(3): 17–29. <http://www.mojet.net/index.php/mojet/article/view/18>
- [27] HO K. F., HO C. H., and CHUNG M. H. Theoretical Integration of user satisfaction and technology acceptance of the nursing process information system. *PLoS ONE*, 2019, 14(6): 1–14. <https://doi.org/10.1371/journal.pone.0217622>
- [28] KUSTONO A. S. Use of internet banking for payment of tuition fees. *International Journal of Innovation, Creativity, and Change*, 2020, 14(5): 292–310. https://www.ijicc.net/images/Vol_14/Iss_5/14519_Kustono_2020_E_R.pdf
- [29] LAI P. C. The literature review of technology adoption models and theories for the novelty technology. *Journal of Information Systems and Technology Management*, 2017, 14(1): 21–38. <http://dx.doi.org/10.4301/S1807-17752017000100002>
- [30] YUNIARTI V., & EKOWATI W. H. Factors affecting interest in using financial technology peer to peer lending. *Journal of Chemical Information and Modeling*, 2019, 53(9): 1689–1699.
- [31] SUANA W. Students' internet access, internet self-efficacy, and internet for learning physics: gender and grade differences. *Journal of Technology and Science Education*, 2018, 8(4): 281–290. <https://doi.org/10.3926/jotse.399>
- [32] NAGY J. T. Evaluation of online video usage and Learning Satisfaction: An Extension of the Technology Acceptance Model. *International Review of Research in Open and Distance Learning*, 2018, 19(1): 160–185. <https://doi.org/10.19173/irrodl.v19i1.2886>
- [33] LEE Y. H., KOZAR K. A., and LARSEN K. R. T. The technology acceptance model: past, present, future. *Communications of the Association for Information Systems*, 2003, 12(50): 752–780. <https://doi.org/10.17705/1CAIS.01250>
- [34] YUWANA A. M., & KUSTONO A. S. Why is User's Expertise Important for Implementation of Regional Asset Information Systems: Case in Indonesia. *International Journal of Science and Research*, 2017, 6(7): 377–379. https://www.ijsr.net/get_abstract.php?paper_id=ART20175027
- [35] CIGDEM H., & OZTURK M. Factors affecting students' behavioral intention to use LMS at a Turkish post-secondary vocational school. *International Review of Research in Open and Distance Learning*, 2016, 17(3): 276–295. <https://doi.org/10.19173/irrodl.v17i3.2253>
- [36] KAO C. P., LIN K. Y., and CHIEN H. M. Predicting Teachers' behavioral intentions regarding web-based professional development by the theory of planned behavior. *Eurasia Journal of Mathematics, Science and Technology Education*, 2018, 14(5): 1887–1897. <https://doi.org/10.29333/ejmste/85425>
- [37] MEHTA A. Technology acceptance of e-learning within a blended vocational course in West Africa. *Proceedings of the International Conference e-Learning 2014. Multi Conference on Computer Science and Information Systems, Lisbon, 2014*, pp. 324–328. <https://files.eric.ed.gov/fulltext/ED557293.pdf>
- [38] PHAM C. H., VU N. H., and TRAN G. T. H. The role of e-learning service quality and e-trust on e-loyalty. *Management Science Letters*, 2020, 10(12): 2741–2750. <https://doi.org/10.5267/j.msl.2020.4.036>
- [39] NAUJOKAITIENE J., TERESEVICIENE M., and ZYDZIUNAITE V. Organizational support for employee engagement in technology-enhanced learning. *SAGE Open*, 2015, 5(4): 1-9. <https://doi.org/10.1177/2158244015607585>
- [40] KUSTONO A. S. How total quality management mediates antecedent variables of employee performance? *The Journal of Asian Finance, Economics, and Business*, 2020, 7(12): 523–534. <https://doi.org/10.13106/jafeb.2020.vol7.no12.523>
- [41] TARHINI A., HONE K., and LIU X. User acceptance towards web-based learning systems: investigating the role of social, organizational, and individual factors in European higher education. *Procedia Computer Science*, 2013, 17: 189–197. <https://doi.org/10.1016/j.procs.2013.05.026>
- [42] GALY E., DOWNEY C., and JOHNSON J. The effect of using e-learning tools in online and campus-based classrooms on student performance. *Journal of Information Technology Education: Research*, 2011, 10(1): 209–230. <https://doi.org/10.28945/1503>
- [43] ABDULLAH F., & WARD R. Developing a general extended Technology Acceptance Model for e-learning (GETAMEL) by analyzing commonly used external factors. *Computers in Human Behavior*, 2016, 56: 238–256. <https://doi.org/10.1016/j.chb.2015.11.036>
- [44] WINARTO P. M., & TAMBUNAN A. P. Students' acceptance towards blended learning implementation. *Journal of Physics: Conference Series*, 2019, 1280(3): 032031. <https://doi.org/10.1088/1742-6596/1280/3/032031>
- [45] RADIF, M., & MOHAMMED, N. A. Computer science teacher's perception and needs towards E-learning in Iraq. *Journal of Southwest Jiaotong University*, 2019, 54(5). <https://doi.org/10.35741/issn.0258-2724.54.5.42>
- [46] ALRUBAIE, S.A., ALRUBAIE, M.A., and HASSOON, I.M. The Role of Activating Electronic Training in Increasing Efficiency of Training Process. *Journal of Southwest Jiaotong University*, 2020, 55(1). <https://doi.org/10.35741/issn.0258-2724.55.1.18>

参考文献:

- [1] SUN P.-C., TSAI R. J., FINGER G., CHEN Y.-Y. 和 YE H D. 是什么因素推动成功的电子学习? 影响学习者满意度的关键因素的实证研究. *计算机与教育*, 2008, 50 (4) : 1183-1202 。 <https://doi.org/10.1016/j.compedu.2006.11.007>
- [2] WU J. H., TENNYSON R. D. 和 HSIA T. L. 在混合电子学习系统环境中对学生满意度的研究. *计算机与教育*, 2010, 55 (1) : 155-164. <https://doi.org/10.1016/j.compedu.2009.12.012>
- [3] ADEWOLE-ODISHA E. 尼日利亚西南大学学生对电子学习的态度: 技术接受模型的应用. *图书馆哲学与实践*, 2014, 1 。

<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=2504&context=libphilprac>

[4] DAVIS F. D. 感知的有用性, 感知的易用性以及用户对信息技术的接受。管理信息系统季刊, 1989, 13 (3): 319-140。 <https://doi.org/10.2307/249008>

[5] LE O. T. T. 和 CAO Q. M. 使用越南企业的基于云的会计软件检查技术接受模型。管理科学快报, 2020, 10 (12): 2781-2788。 <https://doi.org/10.5267/j.msl.2020.4.032>

[6] DAVIS F., BAGOZZI R. P. 和 WARSHAW P. R. 计算机技术的用户接受度: 两种理论模型比较。管理科学, 1989, 35 (8): 982-1003。 <https://doi.org/10.1088/2058-7058/30/1/43>

[7] IGBARIA M. 和 IIVARI J. 自我效能对计算机使用的影响。欧米茄, 1995, 23 (6): 587-605。 [https://doi.org/10.1016/0305-0483\(95\)00035-6](https://doi.org/10.1016/0305-0483(95)00035-6)

[8] KUSTONO A. S. 和 VALENCIA Z. G. 知识共享的有效性如何影响东爪哇—印度尼西亚的企业资源计划系统案例。高等科学快报, 2017, 23 (5): 4295-4297。 <https://doi.org/10.1166/asl.2017.8263>

[9] KUSTONO A. S., NANGGALA A. Y. A. 和 MAS'UD I. 影响大学生使用电子钱包进行交易付款的决定因素。文图拉经济, 商业与会计杂志, 2020, 23 (1): 85-95。 <https://doi.org/10.14414/jebav.v23i1.2245>

[10] SANTIKA I. W. 和 YADNYA I. P. 对吉安雅的手工业中小企业使用电子商务的技术接受模型的分析。全国爱米研讨会, 2017, 第 255-264 页。

[11] LEE J.-W. 和 MENDLINGER S. 感知到自我效能感及其对在线学习接受度和学生满意度的影响。服务科学与管理学报, 2011, 4 (3): 243-252。 <https://doi.org/10.4236/jssm.2011.43029>

[12] MANSYUR M., RAHAMMA T. 和 FATIMA J. M. 在 SMP 内吉里 11 帕累上学生的视觉媒体素养技能以及学习信息和通信技术 (信息通讯技术) 的成功。喀麦隆新闻杂志 (贾纳尔·科穆尼卡西·卡里巴), 2013, 2 (4): 379-385。 <https://media.neliti.com/media/publications/96455-ID-kemampuan-literasi-media-visual-siswa-da.pdf>

[13] DWIUTAMI L. 和 WARDI T. D. 高中教师的自我效能和信息素养能力。心理学研究与测量杂志, 2015, 4 (2): 65-73。 <https://doi.org/10.21009/jppp.042.04>

[14] SAADÉR. G., NEBEBE F. 和 TAN W. 多媒体学习环境中技术接受模型的可行性: 一项比较研究。跨学科电子技能和终身学习杂志, 2007, 3: 175-184。 <https://doi.org/10.28945/392>

[15] AL-AZAWAI A. 和 LUNDQVIST K. 学习者对在线学习满意度的差异: 阿拉伯语样本中对技术接受模型的扩展。电子学习电子杂志, 2015, 13 (5): 408-426。 <https://academic-publishing.org/index.php/ejel/article/view/1942>

[16] HAFFAR M., AL-KARAGHOULI W., DJEBARNI R. 和 GBADAMOSI G. 组织文化和全面质量管理的实施: 调查多维员工为变革做好准备的中介影响。全面质量管理和卓越业务, 2019, 30 (11-12): 1367-1388。 <https://doi.org/10.1080/14783363.2017.1369352>

[17] FATDINA. 员工认为组织支持的作用是程序正义对组织公民行为的影响的中介。侏儒学报, 2009, 36 (1): 1-17。 <https://jurnal.ugm.ac.id/jpsi/article/view/7901>

[18] HANDAYANI R. 通过技术接受模型分析影响接受个人计算机使用的因素。管理研究与会计, 2010, 1: 55-66。

[19] AL KURDI B., ALSHURIDEH M., SALLOUM S. A., OBEIDAT Z. M. 和 AL-DWEERI R. M. 对使用扫描电镜方法检查影响大学生对电子学习接受行为的影响因素进行的实证研究。国际交互式移动技术杂志, 2020, 14 (2): 19-41。 <https://doi.org/10.3991/ijim.v14i02.11115>

[20] LEGOWO N., ABDURAHMAN E., HERWIDIANA K. I. 和 BUDIASTUTI D. 教师准备的影响, 其能力, 对 LMS 内容的支持及其对布姆公司大学中电子学习效率的影响。国际最新科技工程杂志, 2019, 8 (3): 54-59。 <https://doi.org/10.35940/ijrte.C3875.098319>

[21] AL-HADI S. 政府支持在接受公共组织文化中的信息技术方面的影响。国际商业与社会科学杂志, 2014, 5 (5): 118-124。 <http://ijbssnet.com/journal/index/2476>

[22] FIYAH N., MAYANGKY N. A., HADIANTI S. 和 RIANA D. 学生在电子交易平台应用中的技术接受模型分析。资讯科技杂志 (信息工程学报), 2019, 12 (1): 59-68。 <https://doi.org/10.15408/jti.v12i1.10507>

[23] ANDARWATI M. 和 JATMIKA D. 使用谭模型方法分析同一部门中会计信息系统质量对技术接受的影响。国家信息通报研讨会, 2017。

[24] 陈南成, 李生和李成恩。技术接受模型的最新相关研究: 文献综述。澳大利亚商业与管理研究杂志, 2011, 1 (9): 124-127。 <https://doi.org/10.16194/j.cnki.31-1059/g4.2011.07.016>

[25] NANGGALA A. Y. A. 使用金融科技进行付款: 修改的技术接受模型的方法。当代信息技术, 管理与会计杂志, 2020, 1 (1): 1-8。 <http://journal.p2ai.or.id/index.php/JCITMA/article/view/6>

[26] TAJUDEEN S. A., BASHA M. K., MICHAEL F. O. 和 MUKTHAR A. L. 发展中国家学生对移动设备接受学习的决定因素。马来西亚在线教育技术杂志, 2013, 1 (3): 17-29。 <http://www.mojet.net/index.php/mojet/article/view/18>

[27] HO K. F., HO C. H. 和 CHUNG M. H. 护理过程信息系统的用户满意度和技术接受度的理论整合。公共科学学报, 2019, 14 (6): 1-14。 <https://doi.org/10.1371/journal.pone.0217622>

[28] KUSTONO A. S. 使用网上银行支付学费。国际创新, 创造力和变化杂志, 2020, 14 (5): 292-310。 https://www.ijicc.net/images/Vol_14/Iss_5/14519_Kustono_2020_E_R.pdf

[29] LAI P. C. 有关新颖性技术的技术采用模型和理论的文献综述。信息系统与技术管理学报, 2017, 14 (1): 21-38。 <http://dx.doi.org/10.4301/S1807-17752017000100002>

[30] YUNIARTI V. 和 EKOWATI W. H. 影响使用金融技术点对点贷款的兴趣的因素。化学信息与建模杂志, 2019, 53 (9): 1689-1699。

[31] SUANA W. 学生的互联网访问, 互联网自我效能和用于学习物理的互联网: 性别和年级差异。科技教育学报, 2018, 8 (4): 281-290。 <https://doi.org/10.3926/jotse.399>

[32] NAGY J. T. 在线视频使用和学习满意度的评估: 技术接受模型的扩展。开放和远程学习研究国际评论,

- 2018 , 19 (1) : 160-185 。
<https://doi.org/10.19173/irrodl.v19i1.2886>
- [33] LEE Y. H., KOZAR K. A. 和 LARSEN K. R. T. 技术接受模型：过去，现在，未来。信息系统协会通讯，2003 , 12 (50) : 752-780 。
<https://doi.org/10.17705/1CAIS.01250>
- [34] YUWANA A. M. 和 KUSTONO A. S. 为什么用户的专业知识对于实施区域资产信息系统很重要：印度尼西亚的案例。国际科学与研究杂志，2017, 6 (7) : 377-379 。
https://www.ijsr.net/get_abstract.php?paper_id=ART20175027
- [35] CIGDEM H. 和 OZTURK M. 影响学生在土耳其中等职业学校使用 LMS 的行为意图的因素。开放和远程学习研究国际评论，2016 , 17 (3) : 276-295 。
<https://doi.org/10.19173/irrodl.v17i3.2253>
- [36] KAO C. P., LIN K. Y. 和 CHIEN H. M. 通过计划行为理论预测教师基于网络的专业发展的行为意图。欧亚数学，科学与技术教育杂志，2018, 14 (5) : 1887-1897。 <https://doi.org/10.29333/ejmste/85425>
- [37] MEHTA A. 西非混合职业课程中对电子学习的技术接受。2014 年国际会议电子学习会议录。计算机科学和信息系统多方会议，里斯本，2014，第 324-328 页。
<https://files.eric.ed.gov/fulltext/ED557293.pdf>
- [38] PHAM C. H., VU N. H. 和 TRAN G. T. H. 电子学习服务质量和电子忠诚度对电子忠诚度的作用。管理科学快报，2020 , 10 (12) : 2741-2750 。
<https://doi.org/10.5267/j.msl.2020.4.036>
- [39] NAUJOKAITIENE J., TERESEVICIENE M. 和 ZYDZIUNAITE V. 组织对员工参与技术增强学习的支持。智者开放，2015 , 5 (4) : 1-9 。
<https://doi.org/10.1177/2158244015607585>
- [40] KUSTONO A. S. 全面质量管理如何调解员工绩效的前因变量？亚洲金融，经济与商业杂志，2020, 7 (12) : 523-534 。
<https://doi.org/10.13106/jafeb.2020.vol7.no12.523>
- [41] TARHINI A., HONE K. 和 LIU X. 用户对基于网页的学习系统的接受程度：调查社会，组织和个人因素在欧洲高等教育中的作用。普罗迪亚计算机科学，2013, 17: 189-197。 <https://doi.org/10.1016/j.procs.2013.05.026>
- [42] GALY E., DOWNEY C. 和 JOHNSON J. 在在线和校园教室中使用电子学习工具对学生表现的影响。信息技术教育学报：研究，2011, 10 (1) : 209-230。
<https://doi.org/10.28945/1503>
- [43] ABDULLAH F. 和 WARD R. 通过分析常用的外部因素，开发了用于电子学习的通用扩展技术接受模型（吉他美）。计算机在人类行为中，2016, 56: 238-256。
<https://doi.org/10.1016/j.chb.2015.11.036>
- [44] WINARTO P. M. 和 TAMBUNAN A. P. 学生接受混合学习的实施。物理学杂志：会议系列，2019, 1280 (3) : 032031。 <https://doi.org/10.1088/1742-6596/1280/3/032031>
- [45] M. RADIF 和 N. A. MOHAMMED. 计算机科学老师对伊拉克电子学习的看法和需求。西南交通大学学报，2019 , 54 (5) 。 <https://doi.org/10.35741/issn.0258-2724.54.5.42>
- [46] S.A. ALRUBAIE , M.A. ALRUBAIE 和 I.M. HASSOON. 激活电子培训在提高培训过程效率中的作用。西南交通大学学报，2020 , 55 (1) 。
<https://doi.org/10.35741/issn.0258-2724.55.1.18>