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The Teacher Professional Education Students' Perception on Learning Management System-based Online Learning

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Abstract: This research aimed to investigate the perceptions and impacts of online learning utilizing the SPACE (Electronic religious learning system application) among students enrolled in Teacher Professional Education (TPE) programs at State Islamic Religious Colleges. Employing a quantitative approach, the study utilized linear regression analysis and structural equation modeling through AMOS 23. Effectiveness was gauged using indicators proposed by Robert E. Slavin, encompassing quality of learning, appropriateness of learning level, intensity, and time. The study participants comprised students across three Teacher Professional Education Study Programs. The findings revealed that nearly all participants expressed ease in learning and perceived the modules within SPACE as more effective. They also indicated that the materials/modules in SPACE aligned well with the needs of TPE participants and found the learning procedures within SPACE easy to follow. Notably, incentive variables within implementation indicators had a direct influence on perceived ease of use (user convenience), subsequently impacting the perceived usefulness variable. For future research, integrating direct interview data from students and conducting comparative analyses between offline and online implementations in professional education would provide valuable insights.

INTRODUCTION

The low results of teacher competency tests and teachers' ability to understand teaching materials are educational irony and evaluation material for the world of education to immediately improve teacher professionalization. As a standard for measuring teacher competency, the teacher competency test is an evaluation material regarding teacher quality that must be improved. Standards-based on teacher professional competency can be an instrument to support teacher professional learning (Cheung et al., 2020; Kim, 2021; Pedaste et al., 2019). Teacher professional development needs support on policy, morals, infrastructure, and finances that can lead teachers to be professional (Archibald et al., 2011; Kennedy, 2014; Tanang & Abu, 2014).

Data and facts in the field become evaluation materials without blaming each other; instead, they introspect each other and find the right solution to solve this problem (Ellis, 2009). Meanwhile (Harjanto & Sumunar, 2018) stated that online learning is transforming conventional education into digital form, so it has challenges and opportunities. According to (Sauri et al., 2020), providing an argument that online learning is learning that is done virtually, which is

available. Nevertheless, online learning must still consider teaching competencies (Belawati, 2019; Elizabeth et al., 2010). One of the objectives of implementing the professional teacher program is to produce prospective teachers with competence in planning, implementing, and assessing learning.

The achievement of the TPE goals is certainly our common hope, the hopes of the organizers, in this case, the Educational Personnel Education Institute, the committee, in this case, the Ministry of Religion and the Ministry of Education and Culture, and the participants themselves who during TPE gain knowledge and experience (Ramdhan & Siregar, 2019; Siregar et al., 2020). The implementation of TPE in 2021 is carried out entirely online. This is undoubtedly a challenge in planning, implementation, and evaluation. Online learning prioritizes interaction and provides information that makes it easier for students to improve the quality of learning. In addition, online-based learning makes it easier for each other to improve real life in the learning process. During online TPE, strengthening the professional competence of teachers is facilitated, such as innovative technology-based learning in which there are obstacles such as limited internet networks, very varied technological literacy, and the delivery of material that has not been comprehensive (Darmalaksana et al., 2020; Kurniawan & Zarnita, 2020). The obstacle to implementing digital systems is that they are not ready to accept rapid technological changes, so technology is not cultured and does not become a necessity (Priatna et al., 2020). The implementation of TPE in 2021 will be held online using a Learning Management System (LMS) developed by the Directorate General of Education named SPACE (Electronic Method of Religious Learning System).

Information and communication technology literacy includes all knowledge and skills in utilizing technology (Latip, 2020). Technology cannot be separated because its functions and roles are beneficial in activities, including the world of education, starting from students, educators, and education staff must be adaptive. The use of technology is a reasonable necessity (Susilawati & Sugilar, 2021). Technological Pedagogical Content Knowledge (TPACK) is the understanding needed by teachers to utilize technology appropriately in teaching and learning activities in various material content and teaching materials using appropriate technology and pedagogical methods (Koehler & Mishra, 2009; Sintawati & Indriani, 2019; Susilawati & Sugilar, 2021). Pedagogical techniques that use technology constructively teach content knowledge about what makes concepts easy or challenging to learn, how technology can help solve problems students face, and how technology can be used to build on existing knowledge. This can be achieved if the teacher is ready to apply technology in learning. The ability of educators to use technology is one solution to prepare a competent millennial generation (Fitriah & Mirianda, 2019; Oh & Lee, 2021). Technology in learning needs to be prepared as well as possible, starting from the availability of adequate devices, the ability to use and apply the technology, and the determinant factors that need to be the primary consideration in the implementation of e-learning, one of which is the technology and human resources (Karkina et al., 2020; Normayanti et al., 2020; Priatna et al., 2020).

Information and communication technology advancement brings changes and progress in various sectors, especially in education. The role of information and communication technology in education is significant and can provide convenience to teachers and students in the learning process. This online learning can be held massively and with unlimited students. In addition, online learning can be accessed anytime and anywhere. There is no time

limit for using additional learning materials in the pedagogic aspect. Ten main principles must be considered in planning and implementing online learning, namely, those related to curriculum, material design, planning, learning processes, assessments, and teaching processes (curriculum fit, content design, planning, learning, assessment and teaching) (Elizabeth et al., 2010).

The year 2017 is the tenth year that teacher certification has been implemented through Professional Teacher Training Education (PTTE) since 2007. Then, in 2018, teacher certification was implemented for the first time through Teacher Professional Education (TPE). Since 2019, TPE has implemented a blended learning model, which combines face-to-face learning through workshops, online learning, and field practice. This professional education pathway requires completing a study load of 24 credits, with details of 10 credits online, eight credits through workshops and six credits through field practice (Huda, 2019).

TPE learning carried out online using an LMS needs to be evaluated regarding obstacles, challenges, and readiness of organizers and participants to implement online TPE optimally while minimizing existing deficiencies. There is still limited research on professional teacher education students, especially on the implementation of learning using LMS, and student perceptions about the effectiveness of using LMS are the starting point for carrying out this research. Learning through online and face-to-face learning systems through workshops, Peer Teaching, and PPL went well even though it was not optimal (Hanun, 2021). Islamic Religious Education TPE Students at UIN Mataram passed the National Competency Test with 99% for the Performance Test and 68.42% for the Knowledge Test (Quddus, 2019). The Educational Personnel Education Institute at UIN Sunan Gunung Djati has provided good facilities to support the implementation of the TPE Program (Mulyana et al., 2023). There is an important and significant influence between the perception of ease of use and the usefulness of online learning (Siregar, 2023; Tan & Ng, 2021). This research aims to determine how effective online learning based on the SPACE application is for TPE students at State Islamic Religious Universities and how effective online learning based on the SPACE application is on the ease of users in using SPACE.

TPE learning that is carried out online using a learning management system (LMS) needs to be evaluated regarding obstacles, challenges, and the readiness of organizers and participants so that TPE online can be carried out optimally by minimizing existing deficiencies. This study aims to determine the effectiveness of online learning based on the SPACE application for TPE students at the State Islamic Religious College and the effectiveness of online learning based on the SPACE application on the ease with which users use SPACE.

METHOD

This study uses a quantitative approach. According to (Creswell, 2017; Whittaker, 2021), qualitative research explores and understands the meaning of several individuals or groups of people originating from social problems. This research examines students' perceptions during professional teacher education courses using LMS. Linear regression analysis was used for data analysis using SPSS version 23 and AMOS. To measure students' perceptions about the effectiveness of implementing teacher professional education using LMS, Robert E. Slavin's indicators consist of learning quality, suitability of learning level, intensification, and time. The research population was students at three the Educational Personnel Education Institute providing professional teacher education at State Islamic Religious College in 2021.

The research focused on professional teacher education students learning online because there was no offline learning. The researchers did not compare the results of online and offline teacher professional education. Through purposive sampling, three professional teacher education providers selected the research sample, namely the Tarbiyah and Teacher Training Faculty in Banda Aceh, Bandung and Mataram. This research was carried out in July 2021 until completion.

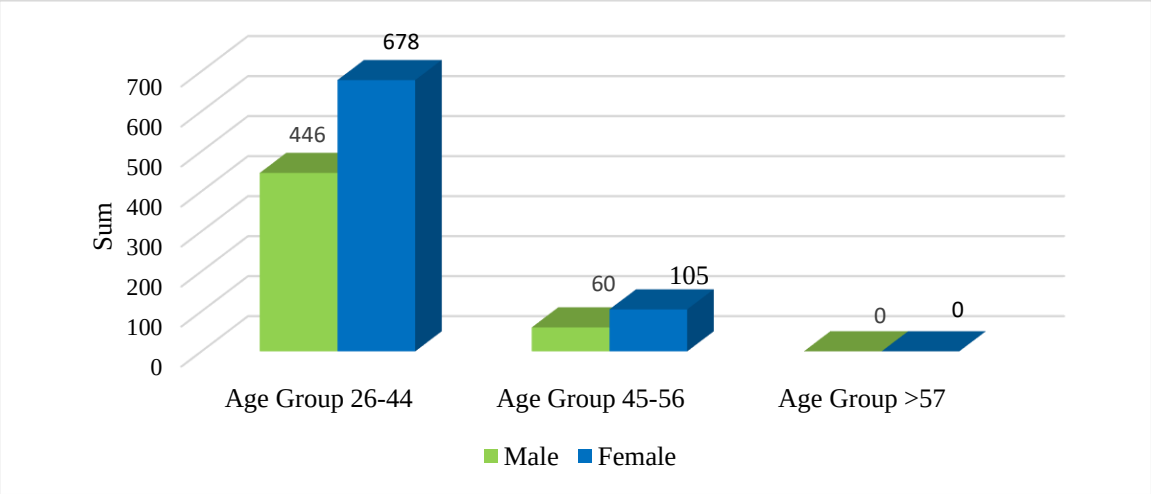

Figure 1. Research Subjects by Age Group.

Based on Figure 1, the research subjects were 1289 students. Based on the age group of student respondents, 87.13% were included in the 26-44 year age group, and 12.87% were included in the 45-56 age group. So, with the application of learning technology using the Electronic Way of Religious Learning System (SPACE) in TPE 2021 activities, many of the millennial age is expected not to have many obstacles in using technology.

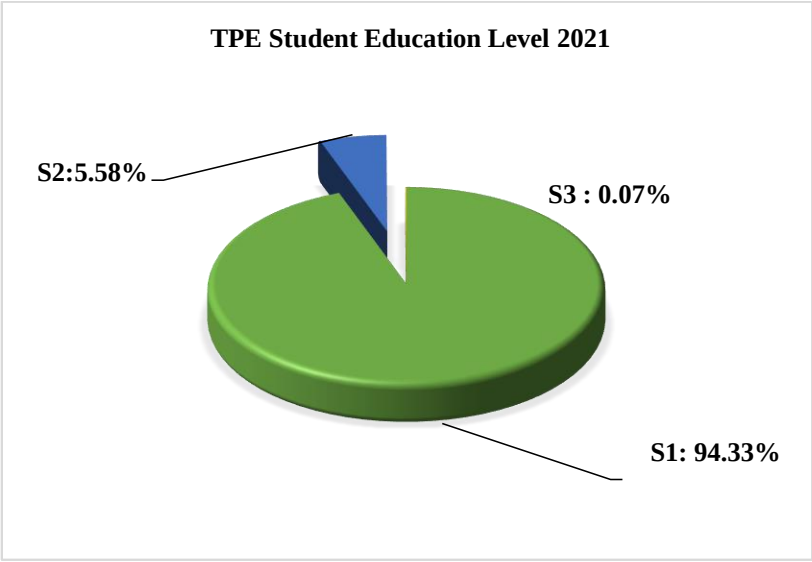

Figure 2. Research Subjects Based on Education Level.

Based on Figure 2, the research subjects were categorized based on their educational levels, specifically undergraduate education, which encompasses strata 1 (S1), strata 2 (S2), and strata 3 (S3). The data indicates that

the majority of TPE students hold an S-1 level, accounting for 4.33%, followed by a smaller percentage at S-2, around 5.58%. Notably, among a total of 1289 students, there was only one student with a doctoral degree, constituting 0.07%.

The research employed a questionnaire and an unstructured interview form as research instruments. Data processing utilized a Structural Equation Modeling (SEM) framework to ascertain the multivariate relationship between variables, alongside employing multiple linear regression to assess the influence between variables. Validity and reliability testing of the questionnaire instrument was initially conducted using SPSS 23.

Table 1. Research Instrument Validity Test.

No.	Variable	Item	Value Correlation (r-count)	Sig	Description
1.	Quality of learning	1	-.672**	.000	Valid
		2	-.376*	.028	Valid
2	Appropriate learning level	1	-.376*	.028	Valid
		2	.144	.041	Valid
		3	.081	.651	Invalid
3.	Intensive	1	-.190	.028	Valid
		2	-.376*	.028	Valid
4.	Time	1	.081	.651	Invalid
		2	-.128	.047	Valid
		3	-.073	.028	Valid

To measure the validity of the test instrument, a questionnaire was given to students carrying out TPE online using LMS at a state Islamic religious college in Bandung. Based on Table 1, the effectiveness indicators consist of four indicators: the quality of learning with two question items, the suitability of the learning level with the three question items, an intensive indicator of two question items, and a three-statement time indicator. For indicators that are not valid, the editorial is revised.

RESULT AND DISCUSSION

Effectiveness of Learning in TPE Student Network (Online)

We adopted Slavin's (2020) definition of effectiveness as our benchmark for measurement. Learning effectiveness, as per Slavin's model, is appraised through four distinct indicators, each uniquely coded: 1) Quality of learning or quality assurance (E1); 2) Appropriate level of instruction (E2); 3) Incentives (E3), denoting the efforts made by instructors to encourage student engagement and completion of assignments, fostering a conducive learning environment; and 4) Time (E4), gauging the temporal investment in the learning process.

Throughout the processing of the questionnaire data, 104 student entries were identified as outliers due to incomplete responses or extreme data values. Consequently, the dataset under analysis was refined, comprising a total of 1185 students for further evaluation and analysis.

Table 2. Description of the Effectiveness of Online Learning.

Indicator	Minimum	Maximum	Mean	Std. Deviation	Category
E1	2,00	4,00	3,93	0,26	Excellent
E2	3,00	6,00	5,87	0,37	Excellent
E3	2,00	4,00	3,84	0,40	Excellent
E4	2,00	4,00	3,89	0,33	Excellent
Valid N (Listwise)			1185		Excellent

Based on Table 2, the average value of the quality of insurance indicator E1 is 3.99, with an excellent category obtained from the score (mean/maximum score x 100) to 98.25 with a standard deviation of 0.262. The E2 indicator of conformity with the learning level with a value of 5.85 in the excellent category was obtained from the score (mean/maximum score x 100) to 97.83 standard deviation of 0.376. The incentive E3 indicator, with an average of 3.84 in the excellent category, was obtained from the score (mean/maximum score x 100) to 96 with a standard deviation of 0.40 and Indicator E4 with an average time of 3.89 with an excellent category. from the value (mean/maximum score x 100) to 97.25 with a standard deviation of 0.33. Furthermore, the results of student responses to the effectiveness of online learning with SPACE are presented in the Table 3.

Table 3. Percentage of TPE Student Online Learning Effectiveness Questionnaire.

Indicator	Statement	Percentage	
		Yes	No
E1	Do you think that the modules presented in SPACE are easy to learn?	93.17	6.83
	Do you think the learning steps in SPACE are easy to follow	98.75	1.25
E2	Is TPE with online learning using the SPACE application more effective	90.45	9.55
	Are the materials/modules in SPACE to the needs of online TPE participants?	96.05	3.95
	I got the required course materials/modules in SPACE	97.75	2.25
E3	Does the lecturer clearly explain the material in SPACE?	85.88	14.12
	Does the lecturer provide feedback when you complete assignments at SPACE	96.66	3.34
E4	Did you study it again after receiving the material from the lecturer through SPACE?	98.21	1.79
	Did you redevelop the material after receiving it from the lecturer through SPACE?	89.99	10.01

Table 4. Correlation Test of TPE Students' Online Learning Effectiveness Variables.

Correlations					
		E1	E2	E3	E4
E1	Pearson Correlation	1	.198**	.164**	.110**
	Sig. (2-tailed)		.000	.000	.000
	N	1185	1185	1185	1185
E2	Pearson Correlation	.198**	1	.177**	.108**
	Sig. (2-tailed)	.000		.000	.000
	N	1185	1185	1185	1185
E3	Pearson Correlation	.164**	.177**	1	.119**
	Sig. (2-tailed)	.000	.000		.000
	N	1185	1185	1185	1185
E4	Pearson Correlation	.110**	.108**	.119**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	1185	1185	1185	1185

**Correlation is significant at the 0.01 level (2-tailed).

Based on Table 3, in the indicators of learning quality, it can be concluded that almost all of them stated that the modules presented in SPACE were easy to learn, and the learning steps in SPACE were easy to follow. Almost all of the indicators of suitability for the level of learning state that online learning using the SPACE application is more effective. The materials/modules in SPACE follow what is needed by online TPE participants and the lecture materials/modules needed in SPACE. Almost all of the incentive indicators state that the material in SPACE is presented clearly, and the lecturer

provides feedback when completing assignments at SPACE. Furthermore, indicators stated that TPE students, after receiving material from the lecturer through SPACE, studied it again and redeveloped it almost all the time.

Furthermore, the correlation between the effectiveness variables will be tested, which is presented in the Table 4. If the significance value (Sig.) is lower than 0.05, there is a significant correlation between the variables associated with the coefficient value. Based on Table 4, the results of Sig. (2-tailed) correlation of E1 to E2 with a value of 0.001; correlation E1 to E3 with a value of 0.001. The correlation test of E1 to E4 is 0.001. Based on the significance of the results, there is a correlation between E1 to E2, E1 to E3, and E1 to E4.

Furthermore, the correlation test E2 to E3 with a value of 0.000 and E2 to E4 with a value of 0.000, so it can be concluded that there is a correlation between the variables E2 to E3 and a correlation between E2 to E4. Furthermore, in the correlation test E3 to E4 with a value of 0.000, it can be concluded that there is a correlation between the variables E3 and E4. In conclusion, all independent variables correlate with the dependent variable.

Table 5. R2 Correlation Test for Effectiveness of TPE Students' Online Lectures.

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.256[a]	.066	.063	.36404

a. Predictors: (Constant), E4, E1, E3

Based on the summary model display, the R2 value of 0.066 or 6.6% is obtained. It means that 6.6% of the variation of the E2 variable or the suitability of the learning level can be explained by the variation of the two independent variables. At the same time, the remaining 93.4% is explained by other factors outside the two variables.

Table 6. Significance Test of TPE Student Online Lecture Effectiveness Variables.

	Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	11.007	3	3.669	27.686	.000[b]
	Residual	156.508	1181	.133		
	Total	167.516	1184			

a. Dependent Variable: E2

b. Predictors: (Constant), E1, E3, E4

Table 7. Effectiveness Coefficient of TPE Student Online Lectures.

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	4.119	.202		20.432	.000
	E1	.238	.041	.167	5.817	.000
	E3	.130	.026	.141	4.922	.000
	E4	.082	.032	.072	2.545	.011

a. Dependent Variable: E2

The obtained significance value from the ANOVA Table (Table 6) is 0.000, which is below the threshold of 0.05. This suggests a significant impact of variables E1, E3, and E4 on the E4 variable. Based on Table 7, no variable affects variable Z of the two independent variables. The regression equation is E2 = 4.119+0.238 E1 + 0.130 E3 + 0.082 E4. From the results of B in the

Unstandardized Coefficients column, it can be concluded that the constant is positive, meaning that, by eliminating other variables, the E2 variable (learning level suitability) is increasing. The variable E1 (quality of learning) is positive, meaning that if E1 increases, the variable E4 increases by eliminating other variables. Variable E3 (incentive) is positive, meaning that by eliminating other variables if E3 increases, variable E2 increases. Variable E4 (time) is positive, meaning that by eliminating other variables if E4 increases, variable E2 increases.

For hypothesis testing H_0, H_1, H_3, and H_4 will be explained as follows:

H_{01}	:	There is no effect of learning quality on the suitability of the learning level.
H_1	:	There is an effect of learning quality on the suitability of the learning level.
H_{03}	:	There is no effect of the use of incentives on the suitability of the level of learning.
H_3	:	There is an effect of the use of incentives on the suitability of the level of learning.
H_{04}	:	There is no effect of time (E4) of use on the suitability of the level of learning (E2).
H_4	:	There is an effect of time (E4) of use on the suitability of the level of learning (E2).

The hypothesis test compares the Sig value with 0.05. As for the basis of the comparison value, if the value of Sig is lower than 0.05, there is an influence between the independent variables and the dependent variable. Based on Table 7, the Sig value of the E1 variable is 0.000, which is lower than 0.05. Therefore, it can be concluded that H_{01} is accepted or H_1 is rejected so that learning quality (E1) affects the suitability of learning level (E2). Furthermore, the Sig value of the E3 variable is 0.000, lower than 0.05. Therefore, it can be concluded that H_{03} is rejected or H_3 is accepted, so there is an incentive effect (E3) on the suitability of the learning level (E2).

Furthermore, the Sig value of the time variable (E4) is 0.011, less than 0.05. Therefore, it can be concluded that H_{04} is rejected or H_4 is accepted so that time (E4) affects the suitability of the learning level. In conclusion, learning quality and incentives affect the suitability of the level of learning, and time of use affects the suitability of the level of learning.

TPE Students' Online Learning Effectiveness Affects Perceived Ease of Use and Usefulness

Based on the circular issued by the Director General of Islamic Education Number 2251, the implementation of In-Service Professional Teacher Education in 2021 will be done online using the Learning Management System Electronic Religious Learning System, abbreviated as LMS SPACE.

The use of LMS SPACE in the learning and teaching process certainly makes it easier for users, both students and lecturers, because they can communicate remotely and access all lecture materials and contracts in one medium. However, on the other hand, it also makes things difficult for them because they have to have good skills and adequate equipment, such as a laptop or computer, adequate internet network quality, and so on. Accessing online learning platforms still requires adaptation because not all students are familiar with online learning.

Apart from that, online learning is the first experience they have not had before, and they are not yet used to the tools and technology used in online learning. To find out how the effectiveness of TPE student online learning on the perceived ease of use and perceived usefulness of the SPACE application is calculated using the help of AMOS 23, which is presented in the Figure 3.

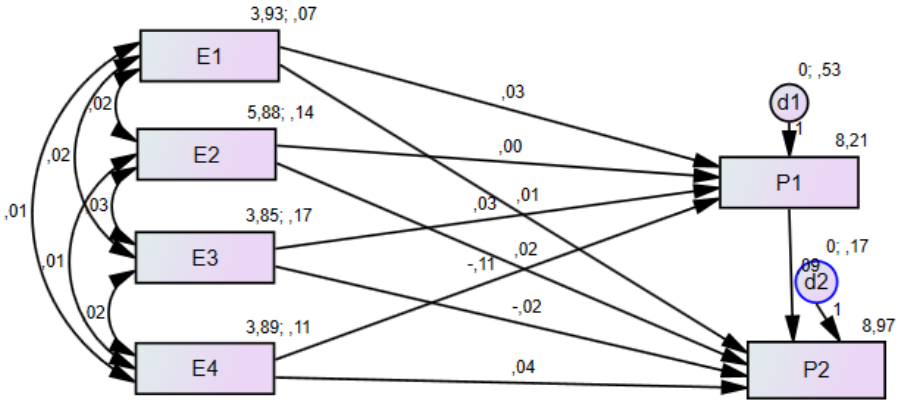

Figure 3. The Effectiveness of TPE Student Online Learning on the Perception of Ease of Use and Usefulness.

The hypothesis tests the significant effect of E1, E2, E3, and E4 on perceived ease of use and perceived usefulness.

H_{01} : There is no significant effect of learning quality (E1) on Perceived Ease of Use (user ease).

H_{02} : There is no significant effect of learning level (E2) on Perceived Ease of Use (user ease).

H_{03} : There is no significant effect of incentives (E3) on Perceived Ease of Use (user convenience).

H_{04} : There is no significant effect of time (E4) on the perceived Ease of Use (user convenience).

The same is true for the test hypothesis on perceived usefulness. In the test criteria, H_0 is accepted if the value of Sig is the same as 0.05. For other conditions, H_0 is rejected.

Table 8. Testing the Relationship Between Variables Based on Regression Weights.

			Estimate	S.E.	C.R.	P	Label
P1	<---	E1	.029	.083	.344	.731	Significant
P1	<---	E2	.003	.058	.046	.963	Not significant
P1	<---	E3	.034	.054	.634	.526	Not significant
P1	<---	E4	-.114	.064	-1.775	.036	Significant
P2	<---	P1	.086	.016	5.252	***	Significant
P2	<---	E1	.007	.047	.143	.886	Not significant
P2	<---	E2	.020	.033	.610	.542	Not significant
P2	<---	E3	-.016	.030	-.535	.593	Not significant
P2	<---	E4	.038	.036	1.033	.302	Not significant

Table 9. Squared Multiple Correlations: (Group Number 1 - Default Model).

	Estimate
P1	.003
P2	.024

The path analysis test on research subjects using AMOS 24 (at the confidence level = 0.05) shows that if the P = *** = 0.000 0.05, H_1 is accepted, or H_0 is rejected. Information regarding the structural relationship between research variables is provided based on the table obtained. Hypothesis testing with endogenous variables (influenced variables) is perceived ease of use as in Table 8 provides information that there is a significant effect of time (E4) on

Perceived Ease of Use (user ease) and there is an effect of perceived ease of use on perceived usefulness.

The R Square value has the effect of jointly or simultaneously with E1, E2, E3, and E4 on perceived ease of use and usefulness. For P1, it is 0.003 with an adjusted r-square value of 0.0031. So, it can be explained that all exogenous constructs (E1, E2, E3, and E4) simultaneously affect the perceived ease of use by 0.003 or 0.3% and the perceived usefulness of 0.024% or 2.4%. Because the Adjusted R Square is less than 33%, the effect of all exogenous constructs E1, E2, E3, and E4 on Perceived Ease of Use and perceived usefulness is weak.

Table 10. Standardized Direct Effects (Group Number 1 - Default Model).

	E4	E3	E2	E1	P1
P1	-.052	.019	.001	.010	.000
P2	.030	-.016	.018	.004	.151

The measurement results show that the variable that has the greatest direct influence on the perceived ease of use variable is the incentive (E3) of 0.019 or 1.9%. Furthermore, the variable that has the greatest direct influence on the perceived usefulness variable is the Perceived Ease of Use of 0.151 or 15.1%. Therefore, it can be concluded that the incentive variable (E3) directly influences the perceived ease of use, and perceived ease of use has the greatest direct influence on the perceived usefulness variable.

Table 11. Standardized Indirect Effects (Group Number 1 - Default Model).

	E4	E3	E2	E1	P1
P1	.000	.000	.000	.000	.000
P2	-.008	.003	.000	.002	.000

Based on the Table 11, there is no indirect influence of variables. There is a significant influence of quality of insurance, appropriate learning level, incentive, and time on perceived ease of use and the incentive variable influences perceived usefulness. The results of these calculations show that learning using LMS using SPACE in terms of indicators of learning effectiveness influences the user's perceived ease. This means that when the application is easy to use, it will influence the effectiveness of the activity. There is a relationship between perceived usefulness and behaviour intention, ease of use and behavioural intention, and self-efficacy and intention towards online learning satisfaction (Arunachalam, 2019; Geier, 2022; Jin et al., 2021). Users will have a good feeling of satisfaction with e-learning if they feel it is useful and easy to use (Selçuk & Avinç, 2021; Lee et al., 2020; Priatna et al., 2020; Shah & Attiq, 2016).

CONCLUSION

Based on indicators of effectiveness, namely the quality of learning (quality of insurance), appropriate level of learning (an appropriate level of instruction), incentives. It expresses how much effort the teacher makes to motivate students to complete or do assignments and study the material provided, and the time is taken to repeat the material is generally categorized as excellent. However, during the teaching profession education (TPE) learning process, there are still network constraints in accessing material in space, and the time limit provided is still limited. The quality of learning and incentives affect the suitability of the level of learning. Further, there is the

effect of time of use on the suitability of the level of learning. In other statistical tests, there is a significant effect of time on perceived ease of use and an effect of perceived ease of use on perceived usefulness.

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