



The Impact of Technology Readiness on Undergraduate Students' Acceptance of Learning Management System

Ika Maryani^{1*}, Yunita Mega Puspitasari² 

^{1,2} Department of Elementary School Teacher Education, Universitas Ahmad Dahlan, Yogyakarta, Indonesia

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ABSTRAK

Permasalahan yang diangkat dalam penelitian ini adalah belum ada studi yang mengukur pengaruh kesiapan teknologi dengan penerimaan mahasiswa terhadap Learning Management System. Penelitian ini bertujuan untuk menganalisis pengaruh kesiapan teknologi terhadap penerimaan terhadap Learning Management System pada mahasiswa. Penelitian ini menggunakan pendekatan kuantitatif dengan jenis *ex post facto*. Metode penelitian menggunakan asosiatif untuk mengetahui hubungan kausal antara kesiapan teknologi dan terhadap Learning Management System. Teknik pengumpulan data menggunakan kuesioner kesiapan teknologi dan terhadap Learning Management System yang kemudian dianalisis menggunakan analisis regresi linear sederhana dengan pengujian hipotesis uji-t. Kuesioner terdiri dari 27 pernyataan valid yang mewakili indikator, optimisme, inovasi, ketidaknyamanan, ketidakamanan, kemanfaatan, kemudahan penggunaan, dan minat menggunakan. Kuesioner didistribusikan kepada mahasiswa melalui WhatsApp dengan teknik *accidental sampling* dan memperoleh 152 responden. Hasil menunjukkan bahwa 66,8% penerimaan terhadap Learning Management System dipengaruhi oleh kesiapan teknologi. Sedangkan, 33,2% dipengaruhi oleh variabel lain. Hasil penelitian ini menunjukkan bahwa terdapat pengaruh positif kesiapan teknologi terhadap Penerimaan terhadap Learning Management System. Hal ini berarti semakin tinggi kesiapan teknologi, semakin tinggi Penerimaan terhadap Learning Management System. Implikasinya, kesiapan teknologi harus ditingkatkan untuk mengoptimalkan penggunaan terhadap Learning Management System. Penerimaan terhadap Learning Management System yang tinggi dapat memberi support pada keberhasilan proses belajar online.

ABSTRACT

The problem raised in this research is that there are no studies that measure the influence of technology readiness on student acceptance of the Learning Management System. This research aims to analyze the influence of technology readiness on acceptance of the Learning Management System among students. This research uses a quantitative approach with an *ex post facto* type. The research method uses associative research to determine the causal relationship between technological readiness and the Learning Management System. The data collection technique uses a technology readiness questionnaire and the Learning Management System which is then analyzed using simple linear regression analysis with t-test hypothesis testing. The questionnaire consists of 27 valid statements representing indicators, optimism, innovation, discomfort, insecurity, usefulness, ease of use, and interest in using. Questionnaires were distributed to students via WhatsApp using *accidental sampling* technique and obtained 152 respondents. The results show that 66.8% of acceptance of the Learning Management System is influenced by technology readiness. Meanwhile, 33.2% is influenced by other variables. The results of this research indicate that there is a positive influence of technology readiness on acceptance of the Learning Management System. This means that the higher the technological readiness, the higher the acceptance of the Learning Management System. The implication is that technological readiness must be improved to optimize the use of the Learning Management System. High acceptance of the Learning Management System can provide support for the success of the online learning process.

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1. INTRODUCTION

Education is undergoing a rapid transformation due to the development of science and technology. The learning model should be flexible, according to students' present needs (Besser et al., 2022; Cavanagh et al., 2020; Hassan et al., 2019). Instructional materials should be designed to provide pupils with challenges to solving problems (Oliveira et al., 2021; Wijaya et al., 2016). For this reason, it is essential for prospective 21st-century teachers, particularly elementary school teachers, to possess technological knowledge. Recent outbreaks of the COVID-19 virus in Indonesia have impeded a variety of activities, including teaching, and learning in schools. Due to social distance, traditional face-to-face learning cannot occur. During this pandemic, e-learning is one of

the most needed learning strategies, particularly at the university level, where students are from diverse places. E-learning has three sorts of educational functions: supplement, complement, and substitution (Apriani et al., 2021; Hadiyanto et al., 2021). By utilizing e-learning, instructors can implement distance learning, in which the teaching and learning process continues even when the instructor is not physically present with the students. E-learning is a product of technological adaptation in learning. E-learning includes online learning media that facilitate distant learning (Amin et al., 2022; Febliza & Okatariyani, 2020; Suratni et al., 2022). According to previous study technology-based e-learning encompasses the use of the internet and other significant technologies for developing learning materials, teaching and learning, and managing courses inside an enterprise (Sureshbabu et al., 2018). Through e-learning, remote delivery of pedagogical content is possible. Educators may also actively assess, observe, provide examples, and engage in other pedagogical tasks to facilitate learning (Lau et al., 2013; Schiaffino et al., 2008). Acceptable media for submissions include audio-visual, audio, graphic, and other formats that are entertaining for students.

As part of the deployment of e-learning, all academic activities in universities are conducted online using the Learning Management System (LMS) during the pandemic. A Learning Management System is an information technology system designed to facilitate and manage the learning process, including the distribution of resources and the facilitation of communication between instructors and students (Coates et al., 2005; Edebatu et al., 2019; Fitriani, 2020; Yawisah et al., 2022). The implementation of LMS in learning activities in higher education still faces obstacles or problems, such as the low level of readiness of students and lecturers (Giatman et al., 2020; Junus et al., 2021), university servers that are not yet adequate for comprehensive LMS implementation (Meyliana et al., 2019; Yawisah et al., 2022), LMS features that are not ready with full online lecture conditions (Djidu et al., 2021; Kautsar et al., 2016; Murad et al., 2020), and others.

The results of interviews with several undergraduate students from the department of primary school education in 2020 showed that they were still accustomed to face-to-face learning and were not ready for sudden changes in using LMS. In addition, they stated that they were unable to comprehend the content offered through the Learning Management System, hence they were hesitant to use the online learning system. Due to these limitations, students frequently complained about the Learning Management System's complexity. The difficulties experienced by students during learning using LMS are technical difficulties, adaptation difficulties, limited teaching materials, and learning media (Melfawani et al., 2022; Tang et al., 2021). If this problem occurs, educators should enhance the motivation of students who have low readiness for new technologies in LMS.

Educators and students cannot immediately accept the usage of e-learning through LMS. For educational institutions or colleges that do not fully adopt e-learning from the beginning of the lecture, implementation challenges are inevitable. Therefore, it is vital to assess students' technology readiness for e-learning and LMS use as a preventative step against this shift. Technology Readiness is used to gauge an individual's propensity to adopt and employ new technologies at home and work (Bosica et al., 2021; Noprianto, 2016). According to previous study technology readiness refers to an individual's propensity to use and utilize new technologies to achieve their goals, both in everyday life and in the world of work (Parasuraman, 2016; Parasuraman & Colby, 2014). This study attempted to measure the readiness level of higher education students to accept Learning Management System technology. Technology readiness consists of four categories of belief dimensions that can affect a person's level of readiness to use and utilize technology, namely optimism, innovativeness, discomfort, and insecurity (Nugroho et al., 2017; Syamfithriani et al., 2021). In addition, this study examined the impact of technology readiness on the respondents' perceived utility, perceived ease of use, and behavioral intentions on the LMS.

This study aims to analyze technology readiness for student LMS acceptance. The novelty of the research lies in the findings about the importance of technology readiness during online learning with LMS. This research is important to prepare students according to their readiness conditions so that the application of LMS is maximized.

2. METHOD

The current study belongs to a quantitative study that employed an ex-post facto design. It was conducted to identify the reasons for changes in behavior, symptoms, or phenomena because of certain events, as well as anything that causes overall changes in the independent variables. Ex-post facto research is research conducted after an event has occurred without the use of additional treatments that can affect the results. To establish the effect of technology readiness on student acceptance of LMS, the ex-post facto design was selected. In greater depth, this study collected data using a correlational design and survey methods. The respondents were selected using the accidental sampling technique, which implies that the sample was chosen by chance or by accident (Etikan et al., 2016; Mohd Ishak et al., 2014). This study's estimation of the minimal sample size was based on the formula (Muhajirin & Jumaidin, 2020). The data collection technique used a closed questionnaire with four indicators 22 questions Technology Readiness and three indicators 15 questions Acceptance of LMS. Based on the number of questionnaire indicators, seven, the minimal sample size for this study is between 35 and 70

participants. After distributing surveys to respondents via Google forms, 152 responses were collected for this study. Then, the research data were examined using a simple linear regression model. This study employed correlational analysis to determine the correlation between Technology Readiness and student acceptance of a Learning Management System. A questionnaire on a Likert scale of 1 to 5 was used to collect data. Table 1 displays the blueprint of the research questionnaire.

Table 1. Blueprint of the Research Questionnaire

Variable	Indicator	Item No.
Technology Readiness	Optimism	1, 2, 3, 4, 5, 6
	Innovativeness	7, 8, 9, 10, 11, 12
	Discomfort	13, 14, 15, 16, 17, 18
	Insecurity	19, 20, 21, 22
Acceptance of LMS	Perceived of Usefulness	23, 24, 25, 26, 26, 28
	Perceived Ease of Use	29, 30, 31, 32, 33
	Behavior Intention	34, 35, 36, 37

Following the validity testing using Pearson Correlation in SPSS V.22, ten questionnaire items (13, 14, 16, 17, 18, 19, 20, 21, 27, and 28) were deemed invalid, where $r_{hit} < r_{table}$ ($r_{hit} < 0.361$). These items were removed from the questionnaire, resulting in a new valid instrument containing 27 statements representing each indicator. The result of the reliability test using Cronbach Alpha in SPSS V.22 showed a Cronbach's Alpha coefficient higher than 0.90 ($0.918 > 0.90$), thus the instrument had high reliability. Following the assumption tests, the research hypothesis was tested using simple linear regression to examine the effect of technology readiness on students' acceptance of LMS.

3. RESULTS AND DISCUSSION

Results

The data collection process was conducted by distributing a Google form questionnaire over the WhatsApp application. In this study, each questionnaire statement was evaluated using a Likert scale ranging from 1 to 5. This study included 840 students enrolled in the primary school teacher education program at Universitas Ahmad Dahlan for the classes of 2019, 2020, and 2021. The research sample included 152 respondents. The results of the data analysis are provided in Table 2.

Table 2. Responses to Technology Readiness per Indicator

No	Indicator	Strongly Disagree	Disagree	Fairly Agree	Agree	Strongly Agree	Number of responses
1	Optimism	6	13	109	390	394	912
2	Innovativeness	3	10	112	454	333	912
3	Discomfort	45	69	12	18	8	152
4	Insecurity	53	56	17	16	10	152
Total		107	148	250	878	745	2128
Percentage		5%	7%	12%	41%	35%	100%

Table 2 shows that 35% of respondents strongly agreed with the indicator of *optimism*, while 5% of respondents strongly disagreed with the indicator of *insecurity*. Responses to acceptance of LMS per indicator is show in Table 3.

Table 3. Responses to Acceptance of LMS per Indicator

No	Indicator	Strongly Disagree	Disagree	Fairly Agree	Agree	Strongly Agree	Number of responses
1	Perceived of Usefulness	7	29	153	263	156	608
2	Perceived Ease of Use	5	9	115	385	246	760
3	Behavior Intention	1	8	85	306	208	608
Total		13	46	353	954	610	1976
Percentage		1%	2%	18%	48%	31%	100%

Table 3 depicts the responses of the students to the indicators of LMS acceptance. Less than half (31%) of the respondents strongly agreed with the indicator perceived ease of use and only 1% of respondents strongly disagreed with the indicator's perceived usefulness. The research data were then analyzed using simple linear regression analysis. The regression analysis was conducted to investigate the relationship between the independent (technology readiness) and dependent variable (Learning Management System) among the participants (preservice elementary school teachers). The analysis was carried out after ensuring that the data were normally distributed, the relationship between the independent variable and the dependent variable was linear, and there was no heteroscedasticity. The result of the normality test is presented in Table 4.

Table 4. The Normality Test Result

Parameters		Unstandardized Residual
N		152
Normal Parameters	Mean	0.000
	Std. Deviation	4.819
Most Extreme Differences	Absolute	0.058
	Positive	0.058
	Negative	-0.055
Test Statistic		0.058
Asymp. Sig. (2-tailed)		0.200

Based on Table 4, The normality test result depicted in Table 4 indicated an Asymp.Sig value (0.2) greater than 0.05. It showed that the data were distributed normally. In addition, the linearity test result can be seen in Table 5.

Table 5. The Linearity Test Result

Parameters			df	Mean Square	F	Sig.
Acceptance of LMS Respondents *	Between Groups	(Combined) Linearity	29	269.708	12.079	0.000
		Deviation from Linearity	1	7039.257	315.267	0.000
Technology Readiness	Within Groups		28	27.939	1.251	0.202
	Total		122	22.328		
			151			

Based on Table 5, it was known that the significance value (0.202) was higher than 0.05, indicating that there was a linear relationship between technology readiness and LMS acceptance as the research variables. The heteroscedasticity test result is shown in Figure 2.

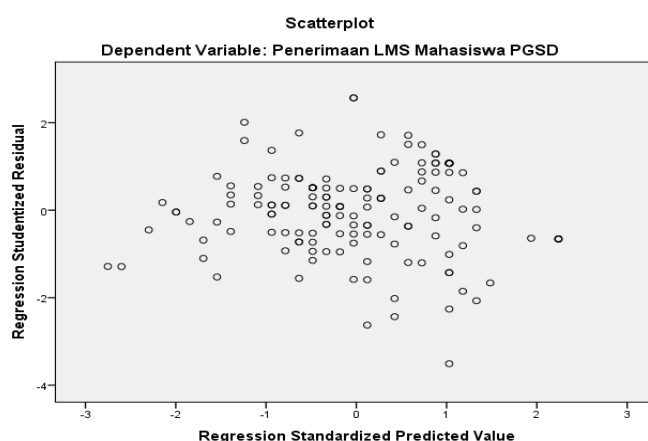


Figure 1. Scatterplot of the Hypothesis Testing

Figure 2 demonstrates that the dots are dispersed across the region above and below 0 on the Y-axis. The spread of these dots does not form a certain pattern, so it can be concluded that there is no heteroscedasticity in the questionnaire data used in this study. Based on the findings of the assumption tests, it can be inferred that the study data were normally distributed, the connection between the two variables was linear, and heteroscedasticity

did not exist. For this reason, the simple linear regression analysis test was performed. Table 6 displays the results of the simple linear regression test.

Table 6. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.817	0.668	0.665	4.83480

Based on the output of the hypothesis testing presented in Table 6, it was found that the R-Square (Determination Coefficient) was 0.668. This figure indicated that 66.8% of students' acceptance of the Learning Management System (LMS) was influenced by technology readiness, while the rest 33.2% was affected by other variables.

Table 7. ANOVA Test Result

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	7039.257	1	7039.257	301.141	0.000
Residual	3506.296	150	23.375		
Total	10545.553	151			

Table 7 reveals a significance value of 0.000, indicating that the regression equation model was significant and fulfilled the criteria. The coefficients are shown in Table 8.

Table 8. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-4.175	3.308		-1.262	0.209
Technology Readiness	1.033	0.060	0.817	17.353	0.000

The hypothesis testing result presented in Table 8 shows a value of -4.175 (the constant of the Unstandardized Coefficient). This value means that without technology readiness, the consistency of students' acceptance of LMS was negative (-4.175). Furthermore, the regression coefficient of 1.033 (Table 8) indicates that a 1% increase in students' technology readiness level will result in a 1.033 increase in their acceptance of LMS. The positive value of the regression coefficient suggests that technology readiness has a positive impact on students' acceptance of LMS. The t_{table} at a 5% level of significance with a degree of freedom more than 120 was 1.960, while $t_{he\ calculated}$ was 17.353. Therefore, it was concluded that the independent variable affected the dependent variable of this study.

Discussion

The results of this study answer research questions about how the influence of TR on LMS acceptance. This is shown through hypothesis testing. The simple linear regression analysis using SPSS V.22 revealed a $t_{calculated}$ of 17.353 and t_{table} of 1.960 at a 5% significance level. There was a significant difference between $t_{calculated}$ and t_{table} , where $t_{calculated}$ was higher than t_{table} . Therefore, H_0 was rejected and H_1 was accepted, meaning that students' technology readiness affected their acceptance of LMS. The coefficient determination in Table 10 shows that 66.8% of students' acceptance of LMS was influenced by their technology readiness, while the rest of them which is 33.2% were affected by other factors that were not examined in this study. Data analysis also resulted in the simple linear regression equation $Y' = -4.175 + 1.033X$. The constant -4.175 indicates that if technology readiness shows the constant zero, then the acceptance of the LMS becomes -4.175. A coefficient regression of 1.033 suggests that an increase in students' technology readiness results in a 1.033 increase in their acceptance of the LMS. Because the regression coefficient is positive, the relationship between variables is also positive.

Based on data analysis, it was concluded that technology readiness had a significant impact on students' acceptance of the LMS, indicated by $t_{calculated}$ (17.353) higher than t_{table} (1.960) at a 5% significance level. The determination coefficient showed that 66.8% of students' acceptance of LMS was affected by technology readiness, while the rest 33.2% was influenced by other variables that were not analyzed in this study. Other factors that might influence student acceptance of LMS in higher education include user interface system design (Suteja & Harjoko, 2008), reachability (Firdaus et al., 2022), complexity (Bhasarie et al., 2021), time constraints (Bhasarie et al., 2021), and others that could serve as references for future studies. User-centered design, in which the user is heavily involved in the design process, is required for the user interface (UI) system (Suteja & Harjoko, 2008).

Poor System UI design may deter users from using the product. A poor user interface system might also result in severe software failures. The variety of cellular services that consumers can access is referred to as reachability in this context. According to Rogers in 1983, the complexity is the users' struggle to adopt new technologies (Bhasarie et al., 2021). The users of the learning management system still have a lot of other activities, therefore the time they have to use the technology is quite constrained (Bhasarie et al., 2021; Firdaus et al., 2022).

The hypothesis testing revealed that students' technology readiness affected their acceptance of LMS, with a constant of -4.175. The constant -4.175 indicates that if technology readiness shows the constant zero, then the acceptance of the LMS becomes -4.175. A coefficient regression of 1.033 suggests that an increase in students' technology readiness results in a 1.033 increase in their acceptance of the LMS. The level of technology readiness can be influenced by four indicators, namely optimism, innovation, discomfort, and insecurity (Ahmad et al., 2021; Fitriani, 2020). These four factors influence whether students accept a LMS. Optimism is a positive view of a technology that can improve the scope of work, control, and effectiveness of a technology's application in daily life. Being an early adopter of new technology and having the ability to keep up with technological advancements are characteristics of innovation. The use of new technology in both daily life and the workplace can cause discomfort and create a sense of insecurity in an individual. Technology Readiness is a metric for determining how a person perceives a technology. Optimism, innovation, discomfort, and insecurity might influence an individual's impression of the advantages and simplicity of using technology. Information technology readiness is most evident in the personnel who will utilize the technology and in the technology itself (Aisyah et al., 2014; Tahar et al., 2020). A person's interest in technology might be influenced by their perceptions of its usefulness and simplicity of use. There is a perception that the level of complexity in utilizing technology is related to the performance advantages attained. This view can alter an individual's desire to use and employ technology in their daily lives (Aisyah et al., 2014; Wilson et al., 2021). If students believe and have confidence in the LMS, they can improve the quality of their work and be more receptive to its benefits and simplicity of use.

This study also found that LMS acceptance was influenced by the student's level of anxiety and confidence. The level of anxiety in question is related to fear of failure and difficulty using the LMS. If students feel apprehensive and less able to leave their work to the LMS, they will be unable to experience the system's benefits and convenience. When students are unable to perceive the benefits and usability of the LMS, they are typically disinterested in using it to complete their coursework. Some methods for reducing anxiety may involve addressing students' fear of failure and self-regulation (Abdi Zarrin et al., 2020; Rymanova et al., 2015). To reduce anxiety, the lecturer should create a structured learning environment, adhere to the timetable, convey any changes or updates in a timely manner, and tailor the assignments to the learning environment. Self-confidence and tenacity were identified as the cornerstones to effective perseverance and might be acquired in college through purposeful projects with LMS (Fitzgerald & Konrad, 2021; Seibert, 2021).

Higher education institutions are expected to conduct a technology readiness assessment before implementing a massive LMS. A readiness survey was conducted on all students and lecturers to find out Optimism, innovation, discomfort, and insecurity to ensure users are ready to accept LMS. A strategies to overcome technological unpreparedness need to be developed, especially those that focus on reducing anxiety and worry. Interventions on these psychological issues can promote technology readiness and LMS acceptance. In LMS development, what needs to be considered is the effect of the relative usefulness, observability, trialability, perceived suitability, complexity, and reported enjoyment on perceived usefulness (Al-Rahmi et al., 2019; Prasetya, 2021). This study recommends that readiness of the LMS features must be a concern to suit the needs of online learning. Adequate servers and system support are the ain prerequisites for users to feel comfortable with their implementation.

4. CONCLUSION

In conclusion, technology readiness has a positive and significant impact on students' acceptance of the Learning Management System. Measurement of technology readiness is very important to support the successful implementation of E-learning through LMS in universities, without having to spend money, effort, and time. This study found that TR is the most significant factor influencing E-learning readiness. Each institution has a different level of readiness. Therefore, each institution must be more careful in determining what factors will be the focus for measuring technology readiness, to obtain accurate information, which describes the actual condition of the institution.

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