

Learning Independence and Learning Achievement Mediated by Learning Motivation in E-learning-Based Lectures

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Abstract

The level of student learning independence in e-learning-based lectures has not been fully able to improve learning achievement without being supported by adequate learning motivation. This study aims to find the effect of the use of e-learning and learning independence, which is mediated by learning motivation, on learning achievement, in university level. This research is a quantitative study with a survey method, where learning motivation is a mediation variable or intervening, learning independence and the use of e-learning are independent variables, and learning achievement is the dependent variable. Involving 20 students of the English language education study program at Universitas Muslim Maros as research subjects, the researchers used documentation and questionnaires to collect data. The data obtained were analyzed using path analysis using the application of IBM SPSS Statistics 19. This research finds that the use of e-learning has a significant effect on university students' learning motivation, learning motivation has a significant effect on university students' learning achievement; and can mediate the use of e-learning in influencing university students' learning achievement. As an implementation in the development of science, the findings of this study reveal the fact that students' learning outcomes are influenced by learning motivation, learning independence, and learning media such as e-learning.

Keywords: *e-learning, learning achievement, learning independence, learning motivation*

Introduction

Blended learning has become an alternative model for many universities to implement flexible learning. In this learning model, lecturers are given the chances to use various alternative learning models that they have mastered (Fresen, 2020). Furthermore, Vallée et al. (2020) stated that one form of blended learning is carrying out online learning at the beginning to the middle of the semester, and offline learning at the middle to the end of the semester. In addition, mixed learning or blended learning can be done by using various applications in the learning process. One of the media that is still an alternative in the learning process is electronic learning or e-learning (Al-Ghadouni, 2021; Bahanshal & Khan, 2021; Mbaka & Mwenda, 2021).

Leading universities in various parts of the world began to adopt e-learning generally in the late 1990s and early 2000s (Gentile et al., 2020; Teo et al., 2020; Zhao et al., 2021). At that time, the use of e-learning became more widespread along with the development of internet technology and the emergence of website-based Learning

Management System. Previously, the concept of computer and network-based learning had existed since the 1970s but had not been widely adopted (Hu et al., 2021; Ozyurt & Ayaz, 2022; Shams et al., 2021). Meanwhile, in Indonesia, e-learning had been used massively by lecturers in all universities as a learning medium since the beginning of 2020 (Fitriyah et al., 2022; Mastan et al., 2022). During the learning process, students and lecturers interact through platforms used to share materials and quizzes, discussion forums, and exams.

Recent studies in the area of the use of e-learning had been conducted by various researchers and educational experts. A research conducted by Singh et al. (2020) found that e-learning has become an integral part of the learning process in the digital era. Therefore, with its advantages, e-learning is able to replace the previous traditional learning. In line with that, Ulanday et al. (2021) analyzed that through the digital platform on e-learning, university students can access lesson materials anytime and anywhere, and it provides greater flexibility in managing students' learning time. In addition, lecturers can share contents in various formats, such as images, videos, and articles. Therefore, students and lecturers carry out an interactive communication that allows students to choose the learning method that most appropriate to their learning style. Furthermore, a research conducted by Al Rawashdeh et al. (2021) concluded that online discussion forums and collaboration tools available on the e-learning platform support interactions among university students that can enrich the learning experience through the exchange of ideas in discussions.

The use of e-learning as a learning medium according to must meet several criteria, including non-linearity, self-managing, and feedback-interactivity (Halvoník & Kapusta, 2020), multimedia learners style, just-in-time, and dynamic updating (Toan et al., 2021), easy accessibility and collaborative learning (Theelen & van Breukelen, 2022). From here, it can be said that when learning must be done online, university students must be able to increase their learning motivation and should have learning independence. It must be understood that online learning requires university students to be independent in attending lectures even though they do not meet with lecturers directly.

The gap between the recent studies and the current empirical and theoretical aspect adalah is the many problems that arise when university students have to take lectures online. Those problems include unstable internet, lots of assignments given by lecturers, and students' lack of understanding on the lesson material (Kassymova et al., 2020; Nouraey & Al-Badi, 2023). With the emergence of various problems, students must solve various obstacles independently (Nashruddin et al., 2020; Stenman & Pettersson, 2020). Therefore, learning independence is needed, namely a person's ability to organize, control, and motivate himself/herself in the learning process without relying on others.

Learning independence is one of the most important elements in achieving good learning outcomes (Moore, 2020). Learning independence involves students' ability to manage time, and requires students to be able to manage resources and understand concepts without direct guidance from lecturers or educators (Bradley, 2021; Curum & Khedo, 2021; Thompson et al., 2021). Learning that is done independently enables students to organize and adjust their own actions (Marra et al., 2022). Indicators of learning independence are having learning initiatives, able to diagnose learning needs, able to set learning targets, monitoring the learning progress, viewing difficulties as challenges, diligent in seeking relevant learning resources, choosing learning strategies,

evaluating the learning process and results, and having self-efficacy (Chau et al., 2021; Cole et al., 2020; Hour et al., 2024). Based on these indicators, it can be said that independence in learning has a direct influence on the motivational and emotional aspects of students.

Learning independence can emerge if students have internal motivation to study theory, formulate personal goals, and understand the relevance of the material in the learning context (Elshareif & Mohamed, 2021; Onah et al., 2021). Learning independence also requires good literacy skill in reading, summarizing, and critically analyzing theories (Dahal & Bhat, 2023; Sidhu et al., 2023). As a positive impact of independent learning, university students can develop their advanced understanding by participating in discussions both online and offline, reflecting the material, and formulating various questions for deeper understanding. Through various combinations of independent learning aspects, university students can become independent, adaptive, competitive, and academically successful learners.

One of the factors that supports academic achievement is learning motivation. Learning motivation is an important factor in supporting the success of online learning because students who have strong intrinsic and extrinsic motivation tend to be more diligent and enthusiastic in following all learning processes (Reed, 2020). Intrinsic motivation includes the inner desire to learn and understand the material, the interest in gaining personal satisfaction, and the passion to achieve personal goals. Meanwhile, extrinsic motivation includes influences such as praise and recognition from lecturers, material rewards, scholarships, and parents' expectations. Besides that, the learning environment and classroom atmosphere can also influence student motivation (Cho et al., 2022; Wang et al., 2023). A comfortable atmosphere can increase university students' motivation to actively participate in learning.

According to Ployhart (2008) indicators of learning motivation are the desire to succeed, the need for learning, having future goals, appreciation for learning, interest in learning, and creating a conducive learning environment. These indicators can be reflected through attendance levels, active participation in class discussions, and interest in learning materials. Students who are consistently present and actively participate tend to have high motivation. In addition, Trust et al. (2022) found that university students' learning motivation can be measured through their initiative in seeking additional data sources and references, the questions they ask during lectures, and their involvement in lecture projects. University students who are able to overcome obstacles, strive to understand difficult subject matter, and find creative solutions, demonstrate a strong motivation to learn.

Universitas Muslim Maros had implemented blended learning since the beginning of the new normal. Every lecturer was given the opportunity to use the Learning Management System (LMS) managed by the university to implement blended learning. In one of the study programs, namely the English Language Education study program, every course must be carried out in 16 meetings, with 50% online using LMS, and 50% offline.

Based on the preliminary study that has been presented, the use of e-learning in blended learning, learning independence, and learning motivation can influence the learning achievement of students in the English Language Education study program at Universitas Muslim Maros. Therefore, researchers were interested in conducting this research further. The novelty of this study is the use of path analysis method with mediating variables that has not been applied by previous other researchers. The

researchers have formulated the research question, namely: How do the use of e-learning and students learning independence affect the learning achievement of students in the English language education study program at Universitas Muslim Maros with learning motivation as a mediating variable?

Method

This research is a quantitative study with a survey method. This research design is appropriate to use to see whether the mediation variable is able to influence the relationship between the independent variable and the dependent variable (Hayes & Preacher, 2014). In this study, learning motivation is a mediation variable or intervening, learning independence and the use of e-learning are independent variables, and learning achievement is the dependent variable. The research design model is presented in Figure 1.

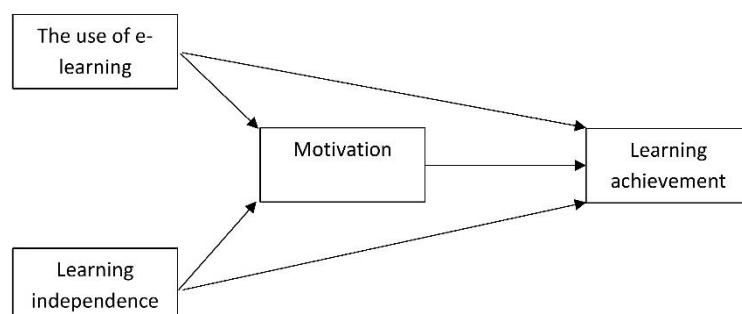


Figure 1. Diagram of path analysis

The population in this study were students of the English Language Education study program at Universitas Muslim Maros, who have taken lectures using the blended learning method, totaling 102 students. By using the Slovin's Formula Sample Size (Tejada & Punzalan, 2012) as a sampling technique, 20 students were obtained as the research sample. The techniques used to collect data were documentation and distributing questionnaires. The data sources for this study were students' final scores and questionnaire results. The final scores of students were used as learning achievement data, while the results of questionnaire were used for data about the use of e-learning, learning independence, and learning motivation. Before being used on research respondents, the questionnaire was first distributed to 30 other students for instrument testing. The instrument was tested to determine its validity and reliability. The data in the study were analyzed using path analysis using the application of IBM SPSS Statistics 19, based on the data analysis theory proposed by Sobel (2014). As a prerequisite for analysis, the data obtained was tested with classical assumption to see whether the data was normally distributed, and there was no autocorrelation, multicollinearity, and heteroscedasticity. Next, a two-stage multiple regression analysis was conducted. The first stage was to see the effect of the independent variable on the mediating variable. The second stage was to see the effect of the independent variable on the dependent variable through the mediating variable.

Results

Classical Assumption Test

The results of the classical assumption tests of this study include normality test, autocorrelation test, multicollinearity test, and heteroscedasticity test. The results can be seen in Table 1.

Table 1. The result of normality test: the kolmogorov smirnov sample

		Unstandardized Residual
N		73
Normal Parameters ^{a,b}	Mean	0,0000001
	Std. Deviation	4,37072642
Most Extreme Differences	Absolute	0,099
	Positive	0,045
	Negative	-0,099
Kolmogorov-Smirnov Z		0,894
Asymp. Sig. (2-tailed)		0,491
a. Distribution test is normal.		
b. From calculated data		

Based on the output above, it is known that the value of Asymp. Sig. (2 tailed) is 0,491. It is higher than 0,05. Thus, the residual data of the study is normally distributed.

Table 2. The result of autocorrelation test of model summary^b

Model	R	R Square	Adjusted R Square	Error Std. of the Estimate	Durbin-Watson
1	0.875 ^a	0.871	0.862	4,579	1,981
a. Predictors: (constant), motivation, independence, e-learning					
b. Dependent Variable: learning Achievement					

Viewing positive autocorrelation by comparing the value of Durbin Watson with the value of dU, so with the value of DW= 1,981 which is higher than the value of dU = 1,7326, so the regression does not get positive autocorrelation problems. Meanwhile, to see negative autocorrelation, the value of 4-DW is compared to the value of dU. So $4 \cdot 1,980 = 7,92 > 1,7326$ does not get negative autocorrelation.

Table 3. The result of multicollinearity and heteroscedasticity test of Coefficients^a

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
Model		B	Error Std.	Beta			Tolerance	VIF
1	(Constant)	-6,036	5,942		-0,853	0,401		
	E-learning	0,391	0,115	0,301	2,878	0,016	0,621	1,512
	Independence	0,580	0,109	0,272	4,291	0,001	0,855	1,71
	Motivation	1,146	0,141	0,641	8,481	0,001	0,634	1,676
a. Dependent variable: learning achievement								

The tolerance value of the use of the e-learning is 0,621, learning independence is 0,855, and learning motivation is 0,634. All of these values are higher than 0,100 which means there is no correlation among the independent variables. Based on the value of sig., all variables have values greater than 0,05 so that the regression does not get heteroscedasticity problems.

Furthermore, the results of the first and second stage regression tests are described in the following Table 4 and Table 5.

Table 4. The result of first stage regression test of Coefficients^a

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(constant)	12,750	5,061		2,514	0,016
	e-learning	0,447	0,076	0,587	5,983	0,001
	Independence	0,043	0,098	0,048	0,551	0,538

a. Dependent variable: learning achievement

Based on the value of sig., the use of e-learning is 0,001 (this value is less than 0.05) so it can be said that the use of e-learning has a significant effect on learning motivation.

Table 5. The result of second stage regression test of Coefficients^a

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	-5,031	5,937		-0,847	0,400
	E-learning	0,291	0,115	0,209	2,879	0,009
	Independence	0,472	0,116	0,268	4,381	0,001
	Motivasi	1,143	0,129	0,629	9,215	0,001

a. Dependent variable: learning achievement

Based on Table 5, the value of sig. for the use of e-learning is 0,009 (this value is less than 0,05) so it can be said that the use of e-learning has a significant influence on learning achievement.

Analysis of direct and indirect effects

The output results above will show the direct and indirect influence of the independent variables (the use of e-learning and learning independence) on the dependent variable (learning achievement), and the independent variables on the dependent variable through mediating or intervening variable (learning motivation).

The following figure 2 shows a summary of the magnitude of this influence based on the output obtained.

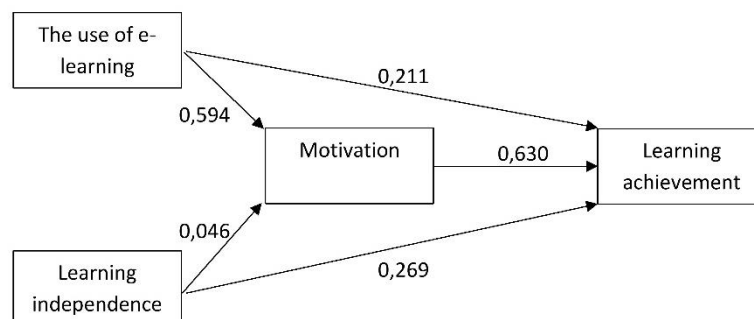


Figure 2. Diagram of path analysis results

Table 6. The result of path analysis test

Variable	Coefficient	Direct	Indirect
X ₁ -Y	0,211	0,211	0,211 x 0,630 = 0,133
X ₂ -Y	0,269	0,269	0,269 x 0,630 = 0,169
Z-Y	0,630	0,630	
X ₁ -Z	0,594	0,594	
X ₂ -Z	0,046	0,046	
e ₁	0,807		
e ₂	0,498		

Based on the results of the path analysis, the information obtained objectively is as follows: The direct influence of the use of e-learning on learning achievement is 0,211; the indirect influence of the use of e-learning on learning achievement through motivation is 0,133; the total influence of the use of e-learning on learning achievement is 0,211+0,133=0,344. The direct influence of learning independence on learning achievement is 0,269; the indirect influence of learning independence on learning achievement through motivation is 0,169; the total influence of learning independence on learning achievement is 0,269+0,169=0,438. Meanwhile, the influence of motivation on learning achievement is 0,630.

Based on the first stage of the Sobel test for the variables of e-learning usage, motivation, and learning achievement, the value obtained is $Z = 4,89 > 1,96$, then the motivation variable is able to mediate the influence of the e-learning usage variable on the learning achievement variable. Meanwhile, based on the second stage of the Sobel test for the variables of learning independence, motivation, and learning achievement, the value obtained is $Z = 0,4572 < 1,96$. Thus, the motivation variable is not able to mediate the influence of the learning independence variable on the learning achievement variable.

Discussion

From the results of data analysis, it can be said that the use of e-learning in lectures has a significant effect on university students' learning motivation. This result supports previous studies conducted by Al Rawashdeh et al. (2021), Elshareif and Mohamed (2021), and Teo et al. (2020) which state that the use of features in e-learning can increase university students learning motivation so that learning outcomes also become better. However, this study develops the findings of previous studies, that e-learning provides students with the opportunity to control their own learning process. Students can organize their study schedule according to their personal needs, choose appropriate resources, and measure their learning progress independently. A well-designed e-learning platform also provides easy access to additional resources, allowing students to explore topics or materials in more depth and develop skills independently.

This study also finds something different from previous research (Nouraey & Al-Badi, 2023; Ulanday et al., 2021) in the term of the learning flexibility. This study reveals that the flexibility provided by e-learning platforms allows students to access materials anytime and anywhere, according to their personal preferences and schedules. This increases intrinsic motivation because students have more control over the learning process. In addition, interactive features in e-learning such as online tests, discussion forums, and online quizzes can create a more engaging learning experience. This fosters extrinsic motivation through recognition and rewards for their academic achievements. By providing a more engaging and relevant learning experience, the use of e-learning is a motivator for students, helps them stay focused, enthusiastic, and committed to achieve their learning goals.

Furthermore, the results of data analysis regarding the learning independence variable show that learning independence does not have a significant effect on learning motivation. This finding contradicts previous studies conducted by Dahal and Bhat (2023) and Hour et al. (2024) which state that learning independence has a positive influence on motivation. This study reveals the fact that even though a person has a high level of learning independence, their learning motivation can be influenced by other factors, such as a lack of interest in the learning material.

In the second stage of regression, data analysis results show that the use of e-learning has a significant effect on learning achievement. It means that the use of e-learning has an influence on students learning outcomes, in line with the results of previous studies conducted by Fitriyah et al. (2022) and Trust et al. (2022). This study shows that online assessment tools in e-learning allow for faster and more structured assessments, allowing lecturers to provide immediate feedback. This provides opportunities for students to respond more quickly in making improvements to assignments that have been assessed by lecturers. This creates a dynamic and responsive learning environment. Data and analysis obtained from e-learning are used by lecturers to identify areas of students' weakness and strength more accurately, allowing for the alignment of teaching strategies to improve overall students' learning outcomes. Thus, the use of e-learning contributes positively to students' academic achievement through a more adaptive, interactive, and measurable learning arrangement.

Furthermore, learning independence also has a significant effect on students' learning achievement. Students who are able to manage their own learning, including planning study schedules, selecting references, and evaluating their study progress, tend to achieve better learning outcomes. The ability to learn independently allows students to adjust their learning approach to their individual learning styles, thereby improving understanding and retention of information on learning materials. This result expands on a research conducted by Onah et al. (2021) that motivation and independence have a very positive effect on learning outcomes. Students who have strong motivation in learning tend to be more enthusiastic in exploring the material, developing a deeper understanding of the material, and maintaining interest in learning.

Path analysis followed by the first stage Sobel test provides a result that the motivation variable is able to mediate the influence of the e-learning usage variable on learning outcomes. This is a novelty in this research. The results of this study indicate that motivation is a very important factor in the learning process using e-learning. Online learning will be successful if students have motivation within themselves. Students who are intrinsically motivated in achieving academic goals tend to be more open to learning technology, in this case the use of e-learning. In addition, students feel challenged to master the use of e-learning and actively participate in digital learning activities. Well-designed learning in e-learning fosters interest and maintains active involvement of students in learning. University students who are motivated and active in e-learning have the potential to have better academic achievements because they are intensively involved in the learning process.

On the other hand, based on the results of the Sobel test in the second stage, it is obtained that the motivation variable is not able to mediate the influence of the learning independence variable on the learning achievement variable. This finding is in accordance with studies conducted by Nashruddin et al. (2020) and Reed (2020) which states that

students are not yet ready enough to undertake the online learning process, due to differences in learning habits and less supportive technology. This study finds that many problems arise when students have to take lectures online, such as unstable internet, lots of assignments given by lecturers, and students' lack of understanding of the subject matter. E-learning that utilizes the internet network will certainly be easy for students who live in areas with stable internet network, but it will be different for students who live in the area with unstable internet network or with no internet. This is a problem that reduces motivation in learning.

Conclusion

Based on the results of the analysis conducted in this study, it can be concluded that: (1) the use of e-learning has a significant effect on university students' learning motivation; (2) learning independence does not have a significant effect on university students' learning motivation; (3) learning motivation has a significant effect on university students' learning achievement; and (4) learning motivation is able to mediate the use of e-learning in influencing university students' learning achievement. For the scientific knowledge development, this study reveals that students' learning outcomes are influenced by learning motivation, learning independence, and learning media such as e-learning.

As the research limitation, this research was conducted by taking a fairly small sample, namely students of the English Language Education study program from only 1 university. Therefore, the researchers suggest that further research be conducted to obtain more in-depth research results, by generalizing to other faculties or universities. It is recommended to conduct more studies using other variables related to learning achievement.

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