

Examining the Effects of Mobile Seamless Learning on Students' Literacy

Intan B. Putri^{1,*}, Abdulloh Hamid², Husniyatus S. Zainiyati³

¹ MAN 3 Tambak beras, Jombang, Indonesia

^{2,3} UIN Sunan Ampel, Surabaya, Indonesia

*Corresponding author. Email: intanadianaaa99@gmail.com

ABSTRACT

Technological developments create new opportunities to develop learning with a technological approach. Borderless learning is identified as a form of mobile learning that can be accessed and continuously improved through technology. The application of mobile seamless learning is defined as a learning model that enables us to learn anytime and anywhere. The purpose of this study is to test whether there is an effect of the application of mobile seamless learning on Islamic Education subject based on the 2013 Curriculum on student achievement in the context of knowing students' literacy. A quantitative approach with a quasi-experimental type of research was chosen in this study. The sample is 120 from 255 students using the cluster random sampling technique. Data were collected by learning outcomes tests. The independent sample t-test shows that the average value of the experimental class with the application of mobile seamless learning is higher than the control class students with blended learning. In conclusion, there was a significant influence of the application of mobile seamless learning on student achievement in the context of knowing students' literacy.

Keywords: Mobile seamless learning, Student learning achievement, Literacy.

1. INTRODUCTION

Since the beginning of the last decade, the development of technology has created new opportunities to develop technology-enhanced learning approaches that truly address the need to nurture a generation of globalized societies, digital lifestyles, and knowledge-based economies in the 21st century [1]. The development of information and communication technology in the last decade has brought extraordinary and rapid changes to various sectors of life, including in the field of education that we are experiencing nowadays. Information and communication technology has a significant influence on students. They can learn with such abundant sources of information [2]. In the 21st century, the emphasis is on learning to create an atmosphere and habit of natural learning processes. The existence of a smartphone as an ever-evolving form of mobile technology becomes a potential for non-contextual learning, that is, learning that takes place anytime, anywhere without time or location restrictions. This is an excellent opportunity for creating natural learning. [3].

Borderless learning is a learning approach characterized by a continuous learning experience combined with location, time, technology, or social settings with a personal mobile device as a mediator.

It is a proposal from one-to-one technology-enhanced learning: An Opportunity for Global Research Collaboration [4]. This is because it is impossible to provide students with all the knowledge and skills they need for lifelong learning through formal learning (or in a specific learning context). Henceforth, students' learning must go beyond curriculum acquisition and be complemented with other approaches to develop learning skills without obstacles.

Mobile seamless learning introduces a concept for continuous or steady learning, known as *istiqomah* in *pesantren*. This learning implies that students can learn whenever they want to know in various contexts. Moreover, students are able to switch from one learning situation to another easily and quickly using personal tools as a mediator [5]. This scenario includes individual and group learning that allows direct or even remote teacher involvement, both in and outside the classroom [6]. Mobile seamless learning is defined as learning that allows learning anytime and anywhere. It can be in formal or informal learning spaces using mobile devices (mobile) as a mediating tool. The phenomenon of continuous learning means accepting learning experiences everywhere [7]. Mobile seamless learning integrates learning experiences across multiple dimensions, including formal and informal learning contexts, individual and social learning, learning through the physical world

and cyberspace [8]. State Madrasah *Aliyah* (Islamic State Senior High School) 3 Jombang is one of the madrasahs that try to innovate independently to efficiently and effectively carry out teaching and learning activities. To realize students who can practice what they have learned is to get students to learn anytime, anywhere. Efforts are being made to implement mobile seamless learning in Islamic Education subject.

Based on the background above, the purpose of this study is to test the hypothesis of whether there is a significant effect on the application of mobile seamless learning on Islamic Education learning based on the 2013 Curriculum on the learning achievement of students at State *Madrasah Aliyah* 3 Jombang. In addition, this research is expected to be relevant for further study material in developing learning models. Moreover, it is expected to be a choice in providing interesting learning and influencing student achievement.

2. METHODS

This study used a quantitative approach with a quasi-experimental research design. The independent variable in this study was the application of mobile seamless learning in Islamic Education subject based on the 2013 curriculum, while the dependent variable in this study was students' learning achievement at State *Madrasah Aliyah* 3 Jombang. The sample in this study were 120 students of XI grade in Mathematics and Natural Science specialization. The selection used cluster random sampling technique from a population of 255 students. The data collection in this research was gained through a test of learning outcomes in the form of multiple-choice and project questions.

The technique of independent sample t-test using a significance level of 0.005 through the application of SPSS version.26.0 for windows was used to process the data statistically. This research was conducted in several stages: 1) research preparation, 2) research implementation, which includes preparing learning tools, such as lesson plan, pretest and posttest questions, project questions, textbooks, student attendance, and learning media, and 3) implementation of mobile seamless learning in the

experimental class, and blended learning in the control class.

The hypothesis in this study was developed based on the following background:

Ho: there is no significant effect of implementing mobile seamless learning on students' learning achievement at State Madrasah *Aliyah* 3 Jombang.

Ha: there is a significant effect of implementing mobile seamless learning on students' learning achievement at State Madrasah *Aliyah* 3 Jombang.

3. RESULTS AND DISCUSSION

The research subjects in this study were students of XI grade in Mathematics and Natural Science specialization at State Madrasah *Aliyah* 3 Jombang, consisting of 60 students in the experimental class and 60 students in the control class.

Table 1. Descriptive Statistics

Between-Subjects Factors			
		Value Label	N
Learning model	1	Mobile Seamless Learning	60
	2	Blended Learning	60
Class	1	Experimental Class	60
	2	Control Class	60

Table 1 is a descriptive statistical table. The table shows the subjects in this study. Sixty students in the experimental class use mobile seamless learning treatment, and 60 students in the control class use *blended learning treatment*. The experimental class was given treatment with the implementation of mobile seamless learning, while the control class was not given treatment and used blended learning.

Table 2. Descriptive Statistics of Independent Sample *T*-Test

Group Statistics					
	Class	N	Mean	Standard Deviation	Standard Error Mean
Learning Outcomes	Experiment class	60	82.17	11.511	1.486
	Control class	60	53.42	11.843	1.529

Table 2 showcases students' learning outcomes in the control and experimental classes. The study results showed a difference in the average number of students in the experimental and control class. The experimental class had a higher average number than

the control class, 82.17 for the experimental class and 53.42 for the control class.

Table 3. Test Results of Independent Sample *T*-Test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Learning Outcomes PAI	Equal variances assumed	.037	.847	13.484	118	.000	28.750	2.132	24.528	32.972
	Equal variances not assumed			13.484	117.905	.000	28.750	2.132	24.528	32.972

Table 3 shows the result of the independent sample t-test was decided to reject Ho and accept Ha. This shows that there is an influence on mobile seamless learning on student achievement in Islamic Education subjects in students. The independent sample t-test obtained the significance value (2-tailed) of 0.000. This value is less than 0.005. Because the significance value (2-tailed) is less than 0.005, it can be concluded that there is a significant influence between mobile seamless learning and student achievement. Thus, it can be stated to reject Ho and accept Ha.

The second hypothesis statement in this study is that there is a significant effect of the application of mobile seamless learning on Islamic Education subject based on the 2013 curriculum on students' learning achievement. The N-Gain Score results also show that the average N-Gain Score for the experimental class is 50.2171, while the N-Gain Score for the control class is 4.8652. Thus, it can be concluded that the application of mobile seamless learning influences the learning achievement of State *Madrasah Aliyah* 3 Jombang students.

Table 4. N-Gain Score test Results

Descriptive					
N-Gain_ Percent	Class	Statistic		Std. Error	
		Mean			
	Experiment	Mean		50.2171	4.95376
		95% Confidence Interval for Mean	Lower Bound	40.3046	
			Upper Bound	60.1295	
		5% Trimmed Mean		52.5560	
		Median		60.0000	
		Variance		1472.381	
		Std. Deviation		38.37162	
		Minimum		-50.00	
		Maximum		100.00	
		Range		150.00	
		Interquartile Range		56.25	
		Skewness		-.759	.309
		Kurtosis		-.030	.608
	Control	Mean		4.8652	3.58362
		95% Confidence Interval for Mean	Lower Bound	-2.3056	
			Upper Bound	12.0360	
		5% Trimmed Mean		7.6132	
		Median		4.1667	
		Variance		770.542	
		Std. Deviation		27.75863	
		Minimum		-120.00	
		Maximum		46.15	
		Range		166.15	
Interquartile Range		26.70			
Skewness		-2.051	.309		
Kurtosis		6.913	.608		

Table 4 shows the results of the N-Gain Score. Furthermore, the average N-Gain Score for the experimental class is 50.2171, while the N-Gain Score for the control class is 4.8652. It can be concluded that the application of mobile seamless learning positively impacts the learning achievement of State *Madrasah Aliyah* 3 Jombang students.

N-gain Score results for the experimental and control classes. The average N-gain Score in the experimental class attains 50.2171 with a minimum value of -50.00 and a maximum value of 100.00. While in the control class, the average N-gain Score is 4.8652 with a minimum score of -120.00 and a maximum score reached 46.15.

The experimental class got better results. This happens because students in the experimental class can use their time well by implementing mobile seamless

learning. It can provide opportunities for students to use gadgets in learning in the long term. Because students can learn anytime, anywhere, and in various learning contexts, students can access the internet properly. The learner-centric does not mean that they are the center of attention of educators alone but as a center for producing knowledge related to several kinds of contexts in the multidimensional educational space. In this case, mobile seamless learning is not only about how education takes place, anywhere and anytime, but education is continuously interwoven across contexts [9]. Through a review of studies, Wong (2011) identified 10 dimensions of mobile seamless learning, namely: (1) formal and informal learning; (2) personal and social learning; (3) passing through time; (4) cross-location; (5) access to ubiquitous knowledge; (6) learning includes the physical and digital worlds; (7) combined use of

several types of devices; (8) switching between multiple tasks; (9) knowledge synthesis, integrating new and previous knowledge, abstract and concrete knowledge, and multi-disciplinary learning; (10) includes several models of pedagogical or learning activities [10].

The learning given to the experimental class provides opportunities for students to get higher learning achievements compared to the control class. The control class with a blended learning model has the opportunity to access the internet in a limited time. They get lessons only through *Madrasah* E-Learning and limited Zoom Meetings. While the experimental class, apart from E-Learning *Madrasah* and Zoom Meetings, they also get lessons through the WA Group. In addition, assignments in the experimental class are also more diverse in using the Internet.

In addition to multiple-choice questions, students are also asked to look for videos related to the material on YouTube. Then, they are asked to analyze the videos and give comments according to what is available. In addition to the video analysis task, students are assigned a project task to create a flyer according to the learning material. Students explore their respective potentials to be more creative. The interaction of students with the internet supports students to have a fun way of learning. They get knowledge from various sources. Mobile technology creates a seamless learning space and a continuous learning experience across different scenarios or contexts. Mobile technology and software can be combined to enhance learning [11].

The results of the assignment of students in the experimental class showed higher results than students in the control class. If this continues, it will provide opportunities for students to learn continuously in understanding the materials. Chen et al. argue that the learning experience can be deepened when a good cycle is created, in which students can build a continuity of experience that connects various learnings [12].

Mobile seamless learning mobile had a significant impact on the ability to master the concepts of fourth-grade elementary school students [13]. In addition, it can improve learning outcomes in the subject of Islamic Economic System [14] and Math [15], in addition to the enhancement of oral presentation skills [16]. Furthermore, learning inside and outside the classroom will allow us to gain insight and build theory on the idea of limitless learning [17]. In this research, it can be seen that students in the experimental class who are taught with mobile seamless learning are more interested and motivated to learn.

Islamic Education (*Pendidikan Agama Islam*) subjects on the theme of human creation and respect and doing good to parents are several themes related to monotheism and morals lessons related to everyday life. Islamic Education subject will be easy to understand if the teacher can develop a learning model that accommodates students' abilities and classroom activities related to the daily life experienced by students to support students' understanding of Al-Qur'an Hadith subjects. This is also in line with the objectives of the 2013 Curriculum. The learning outcome of this curriculum design is that students can practice and implement what they have learned in their daily lives.

Mobile seamless learning is one of the best solutions in providing teaching that has the potential to guide students to learn continuously anytime, anywhere, and under any circumstances. Students can learn in various contexts and scenarios, which ultimately encourage students to have good learning achievements.

4. CONCLUSION

The results of the independent sample t-test show that the average value of the experimental class with mobile seamless learning is higher than the control class with the application of blended learning. The experimental class got an average score of 82.17, while the control class got 53.42. In addition, the significance figure (2-tailed) shows 0.000, where the number is less than 0.005. The N-gain Score test for the experimental class is 50.2171, while the N-gain Score test for the control class is 4.8652. These results mean that the H_0 is rejected and the H_a is accepted. Thus, it can be concluded that there is a significant effect of implementing mobile seamless learning on the learning achievement of students at State *Madrasah Aliyah* 3 Jombang. Based on this research, students in the experimental class who are taught with *mobile seamless learning* are more interested and motivated to learn. At the beginning of the lesson, the researcher delivered the material directly to the classroom by using a PowerPoint presentation. Islamic Education, with the theme of human creation and respect and doing good to parents, are related to monotheism and morals value in everyday life. Islamic Education will be easy to understand if the teacher is able to develop a good learning model that accommodates the students' abilities and related to their daily life to support their understanding. This is also in line with the objectives of the 2013 Curriculum, with the learning outcome that students can practice and implement what they have learned in their daily lives. Mobile seamless learning is one of the best solutions in providing teaching that has the potential

to guide students to learn continuously, anytime, anywhere, and under any circumstances. Students can learn in various contexts and scenarios which ultimately encourage them to have good learning achievements.

AUTHORS' CONTRIBUTIONS

All authors conceived and designed this study. All authors contributed to the process of revising the manuscript, and at the end, all authors have approved the final version of this manuscript.

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