

# The Effect of E-Learning Towards the Implementation of Self-Regulated Learning (SRL) to the Students of Mathematics Education Study Program at Almuslim University

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## ABSTRACT

The purposes of the research is to know the effect of the implementation of e-learning toward Self-Regulated Learning (SRL) to the students of math at Almuslim University. The research used was a quasi-experimental research instrument in the form of a questionnaires sheet. The subject of this research was mathematics education students of class 2017, 2018, and 2019. After conducted the research, the questionnaires result data was in the form of ordinal data which was converted into interval data using the method of successive interval (MSI). The result of the analysis of the normality test obtained sign. 0.951 (normally distributed). Based on the results of hypothesis testing, the sign. value is obtained equal to  $0.003 < \alpha (0.05)$ . It can be concluded that there are an effect of the application of e-learning on the Self-Regulated Learning (SRL) to the students at mathematics education study program; at Almuslim University, and the result of learning through E- learning shown that the students have good Self-Regulated Learning (SRL).

**Keywords:** E-Learning, Self-Regulated Learning (SRL).

## 1. INTRODUCTION

Learning is said to be effective if it uses science and technology optimally in teaching and learning activities as a tool. One of the uses of science and technology in the teaching and learning process is the use of e-learning. E-learning is a form of learning media in the form of information technology and is applied in internet-based education. E-learning can be used to improve skills in understanding material, increase the number of materials or teaching materials, increase learning activities and make it easier for educators to streamline teaching and learning time in class [1]. Education in implementing e-learning act as facilitators and guides while students act as independent learners, able to solve problems and construct knowledge [2].

The application of technology such as e-learning in learning can make students more independent, this is in line with what was stated by [3]. Students can deepen their knowledge based on their own way via the internet and based on educators' directions. With the internet, students can find their own learning resources anywhere. However, offline meetings are also needed so

that the interaction between educators and students runs well. Independence or what is called Self-regulated learning (SRL) appears when students position themselves in a position to learn not to depend on others and have self-confidence in dealing with problems that occur.

This is contrary to what happened in the field, especially for students of Almuslim University Mathematics Education. Mathematics Education students who have high SRL are only around 35% while the remaining 65% have low SRL. The problems it faces are related to activeness in learning activities, learning outcomes, and the lack of ability to use the internet so that students will ask their friends or lecturers without having to try themselves. If this continues, students will find it difficult to be independent. Based on this, a method or strategy is needed to overcome this problem. One thing that can be done is by using e-learning in the learning process so that Mathematics Education students are able to increase SRL.

Several studies that have been carried out related to independent learning in e-learning or online learning, namely research from [4] said that online lectures greatly affect the learning independence of students of the Malikussaleh University Mathematics Education Study Program. Then [5] showed that the application of online learning using Edmodo during distance learning during the Covid-19 pandemic had a positive impact on student learning independence in the Geometry course. Then [6] showed that the implications of the e-learning model for students' independence and interest in learning and [7] said that the level of student satisfaction in using e-learning reached 77%. Furthermore, [3] shows that students have high learning independence using blended learning. In addition, research from [8] shows that students in Indonesia still need mentoring and guidance from teachers to improve SRL. Then [9] said that there was a significant difference between the learning achievement of students treated with the SRL model and students treated with the conventional model. Then, [10] said that students who have high SRL are more than students who have low SRL. Furthermore [11] stated that there was a significant influence between SRL and SD students' learning independence. The better SRL students have, the better the student's learning independence.

Based on the several studies that have been conducted, the researchers are interested in conducting a study entitled the effect of e-learning toward the implementation of SRL to the students of the mathematics education Study Program at Almuslim University. This research may have been carried out by many other researchers, but the average research analyzed with descriptions such as described based on the results of the presentation for the SRL questionnaire. Researchers will analyze the data for e-learning learning will use a questionnaire to see the response and then for independent learning will also use a questionnaire to see the response. Furthermore, it will be seen how the effect of e-learning learning response on SRL which is analyzed using simple correlation.

**2. METHOD**

The method used in this research is a quasi-experiment. The design used in the study was the posttest-only control-group design. The application of e-

learning learning is carried out in the Almuslim University Mathematics Education Study Program environment. The subjects in this study were mathematics education student's classes 2017, 2018, and 2019. This research was conducted in the 2020/2021 academic year in October 2020. The independent variable in this study was learning using e-learning. The dependent variable is the student's SRL.

The method for data collection used in this study was a questionnaire method. The questionnaire method is used to find out how students respond to learning using e-learning learning. In addition, a questionnaire is also used to determine SRL. The questionnaire used uses a Likert scale. The student response questionnaire after e-learning was applied in learning consisted of nine-question items. This question contains the application of e-learning-based learning, learning motivation, interest in learning. For the SRL questionnaire or learning independence, it consists of fifteen item questions. The item questions contain questions about thinking awareness in learning mathematics, e-learning, motivation in learning mathematics, and beliefs in learning mathematics.

The research instrument used in this research was a questionnaire sheet. Before the instrument was used, the content validity and reliability were tested. The statistical analysis used to test the hypothesis is a simple correlation formula. Before testing the hypothesis, the normality test is conducted first. Based on the test results, the data are normally distributed. The data obtained are in the form of ordinal data, then first converted into interval data using the method of successive interval (MSI), then the data will be processed with the help of SPSS 22.

**3. RESULT AND DISCUSSIONS**

Following are the results of data analysis where the ordinal data obtained from e-learning learning questionnaires and SRL questionnaires are then converted into interval data. If the ordinal data is not changed or convention to interval data, then the data cannot be analyzed using SPSS. Following are the results of the e-learning learning questionnaire that has been convention with MSI. The results can be seen in Table 1.

**Table 1.** The Results of the E-learning Learning Questionnaire Convention with MSI

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4.646	3.431	3.527	4.597	2.900	4.970	3.381	4.646	3.952	4.971	2.961	3.650	3.000	3.000	3.000
3.000	2.000	2.000	4.597	2.900	4.970	3.381	4.646	3.952	4.971	2.961	3.650	3.000	3.000	3.000
4.646	3.431	3.527	4.597	4.167	4.970	3.381	4.646	3.952	3.502	2.961	3.650	3.000	3.000	3.000
4.646	3.431	3.527	4.597	4.167	4.970	4.768	4.646	3.952	3.502	2.961	3.650	4.604	3.000	3.000
4.646	4.857	3.527	4.597	2.900	3.502	3.381	4.646	3.952	3.502	4.569	3.650	4.604	3.000	3.000

4.646	3.431	5.102	4.597	4.167	4.970	4.768	4.646	3.952	3.502	4.569	3.650	3.000	3.000	3.000
3.000	3.431	3.527	3.000	1.894	3.502	3.381	4.646	5.772	3.502	4.569	5.258	3.000	4.646	4.604
3.000	3.431	3.527	3.000	4.167	4.970	2.000	4.646	5.772	2.000	2.961	2.000	4.604	4.646	4.604
4.646	4.857	3.527	3.000	2.900	3.502	2.000	4.646	3.952	4.971	2.961	5.258	4.604	4.646	4.604
4.646	3.431	3.527	3.000	1.894	4.970	4.768	4.646	3.952	4.971	2.961	3.650	3.000	3.000	3.000
4.646	4.857	2.000	4.597	4.167	4.970	3.381	4.646	3.952	3.502	2.961	3.650	3.000	3.000	3.000
3.000	2.000	5.102	4.597	2.900	3.502	4.768	3.000	3.952	3.502	2.961	3.650	4.604	3.000	3.000
4.646	3.431	3.527	3.000	1.000	3.502	3.381	3.000	3.952	3.502	1.000	3.650	4.604	4.646	4.604
4.646	3.431	2.000	3.000	2.900	3.502	4.768	3.000	3.952	3.502	2.961	2.000	3.000	4.646	4.604
3.000	3.431	3.527	4.597	2.900	3.502	3.381	3.000	2.000	3.502	2.961	5.258	3.000	3.000	4.604
3.000	4.857	3.527	4.597	2.900	3.502	3.381	4.646	3.952	3.502	2.961	3.650	3.000	3.000	3.000
4.646	4.857	3.527	3.000	4.167	3.502	3.381	4.646	3.952	4.971	1.621	3.650	3.000	4.646	3.000
4.646	3.431	2.000	3.000	1.894	3.502	2.000	3.000	3.952	2.000	2.961	3.650	4.604	3.000	4.604
4.646	4.857	3.527	3.000	2.900	2.000	3.381	3.000	3.952	3.502	2.961	3.650	4.604	3.000	4.604

Furthermore, the following data is for the SRL questionnaire that has been convention with MSI. The results can be seen in Table 2.

**Table 2.** SRL Questionnaire that has been Convention with MSI

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.575	3.655	3.646	3.798	2.000	3.468	3.934	3.646	4.683	3.620	3.638	3.604	4.971	3.469	4.737
4.065	2.351	2.000	2.351	3.597	3.468	3.934	3.646	4.683	3.620	3.638	3.604	2.000	4.971	4.737
2.575	3.655	3.646	2.351	3.597	4.970	3.934	3.646	4.683	3.620	2.187	3.604	3.469	3.469	3.000
2.575	3.655	3.646	2.351	3.597	3.468	3.934	3.646	4.683	3.620	3.638	2.000	4.971	2.000	4.737
2.575	2.351	2.000	1.000	2.000	3.468	3.934	3.646	4.683	3.620	3.638	2.000	3.469	3.469	4.737
4.065	3.655	3.646	2.351	3.597	3.468	3.934	3.646	4.683	3.620	3.638	3.604	3.469	2.000	3.000
2.575	3.655	3.646	2.351	2.000	3.468	3.934	2.000	4.683	3.620	3.638	3.604	3.469	4.971	4.737
2.575	2.351	3.646	3.798	3.597	2.000	2.000	3.646	4.683	2.000	3.638	2.000	3.469	3.469	4.737
4.065	3.655	3.646	3.798	2.000	2.000	2.000	3.646	3.000	3.620	2.187	3.604	3.469	3.469	4.737
4.065	3.655	3.646	3.798	2.000	2.000	3.934	3.646	3.000	3.620	2.187	3.604	2.000	3.469	3.000
2.575	3.655	3.646	2.351	3.597	3.468	3.934	3.646	3.000	3.620	2.187	2.000	2.000	3.469	4.737
1.000	2.351	2.000	2.351	3.597	2.000	3.934	2.000	3.000	2.000	2.187	2.000	3.469	3.469	4.737
4.065	5.082	3.646	3.798	2.000	2.000	3.934	3.646	4.683	2.000	1.000	3.604	3.469	3.469	4.737
2.575	2.351	2.000	3.798	3.597	2.000	3.934	2.000	4.683	3.620	3.638	2.000	3.469	3.469	4.737
4.065	2.351	2.000	2.351	2.000	3.468	3.934	2.000	4.683	2.000	3.638	3.604	2.000	2.000	4.737
4.065	3.655	3.646	3.798	2.000	3.468	3.934	3.646	3.000	2.000	3.638	3.604	2.000	3.469	3.000
2.575	2.351	3.646	3.798	2.000	3.468	3.934	3.646	4.683	3.620	2.187	2.000	3.469	3.469	4.737
2.575	2.351	2.000	3.798	2.000	2.000	3.934	2.000	4.683	2.000	3.638	3.604	3.469	2.000	4.737
2.575	1.000	3.646	3.798	3.597	2.000	3.934	2.000	4.683	2.000	3.638	2.000	3.469	2.000	4.737

The convention data was then analyzed to test the hypothesis. Where

Ho: There is no effect of the application of E-learning on the SRL of Almuslim University mathematics education study program students.

Ha: There is an effect of the application of E-learning on the SRL of Almuslim University mathematics education study program students.

However, before testing the hypothesis the data is first tested for normality. Based on the results of the normality test, it was obtained sig 0.951, which means

that the data were normally distributed. The results of the analysis are as in Table 3 below;

**Table 3.** Test Distribution is Normal.

		Unstandardized Residual
N		19
Normal Parameters	Mean	.0000000
	Std. Deviation	2.84403756
Most Extreme Differences	Absolute	.119
	Positive	.104
	Negative	-.119
Kolmogorov-Smirnov Z		.518
Asymp. Sig. (2-tailed)		.951

After the data is normally distributed, hypothesis testing is carried out. From this test, the sig value is obtained of  $0.003 < \alpha (0.05)$ . The results using SPSS are shown in the following Table 4.

**Table 4.** Dependent Variable: SRL

Model	Unstandardized Coeff <sup>a</sup>		S. Coef	T	Sig.
	B	Std. Error	Beta		
Constant	25.65	6.74		3.80	.001
E-learning	.766	.221	.643	3.46	.003

Based on the results of the analysis, it can be concluded that there is an effect of the application of E-learning learning on the SRL of Almuslim University mathematics education study program students. The results of this study are in line with the results of previous studies where [4] said that online lectures greatly affect the learning independence of students of the Malikussaleh University Mathematics Education Study Program. In addition, research [6] also shows that the implications of the e-learning learning model on students' independence and interest in learning.

The effect of the application of e-learning learning on student SRL can be caused by e-learning learning to make students more independent, students must be more proactive in the learning process. Students must be able to control the awareness of thinking in learning, be able to determine targets, learning objectives, implement learning strategies, evaluate the learning process, be able to motivate learning and students must have confidence in learning.

## 4. CONCLUSION

Based on the analysis and discussion that has been described, it can be concluded that there is an effect of the application of E-learning learning on SRL students of Almuslim University mathematics education study program. Furthermore, learning using E-learning makes students have better SRL. The suggestion from the results of this study is that a better understanding of ICT is needed for lecturers and students so that learning with e-learning can run even better.

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