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Analysis of metacognitive capability and student learning achievement through edmodo social network

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Abstract. Along with the development of learning technology in the current era of disruption, it is necessary to modify learning to avoid monotonous and boring learning. The study aimed to determine the effect of learning using Edmodo on meta-cognition abilities and student learning achievement. In the analysis shows that there are differences in meta-cognition abilities of students learning to use Edmodo media when compared to the conventional student learning. The same thing happened on student achievement. While the results of the analysis to answer there any influence of learning using social media Edmodo towards metacognitive abilities and achievements of students, the answers to these questions, there is a significant influence on the learning using Edmodo media meta-cognitive abilities and student achievement.

1. Introduction

This study is based on the results of the test in mid-2017. From the test results, it is known that the majority of the final value of the students were at low levels. This is very worrying, considering learning should result in changes in student behavior. In addition, the learning process is also capable of improving the knowledge and cognition about cognitive phenomena called cognitive abilities and skills.

Facts on the field show that the learning process in class feels very boring [1]. Problems that often arise in learning are focused on the use of lecture-oriented teaching patterns and methods, the media and learning resources used are very limited, both in terms of quality and quantity [2]. To that end, it is necessary to attract the attention of students and fun. Student interest in the material presented by the teacher, produce a good interaction and conducive learning [3]. The media plays an important role in realizing these conditions, including e-learning learning media. One of the media that can be used is Edmodo, an application developed in 2008 by Nic Borg and Jeff O'Hara, a social networking-based education site [4].

Some studies say that learning to use e-learning with social networking Edmodo able to increase students' motivation. In fact, some explain that the use of learning media is able to improve student learning outcomes [5]. However, not many of them explained that the relationship between Edmodo's

social network learning media was able to improve students' metacognitive abilities. In fact, increasing learning outcomes depending on the ability and cognitive skills of a person, due to the low capacity and metacognitive skills of a person, then the lower the control capability of memory and cognition[6].

As this study aims to determine 1) the difference meta-cognitive abilities of students learning through Edmodo social media with students who studied with conventional methods; 2) differences in student learning achievement through Edmodo social media with students who studied with conventional methods; and 3) the influence of Edmodo's social media interaction on cognitive meta abilities and student achievement.

2. Reseach Method

This study was conducted by quasi through a pretest-posttest Non-equivalent Control Group Design. Analysis of the data using analysis of variance at the significance level of = 0.05. If α indicates the value of F is significant, it is necessary to proceed with a different test. Before the variance test, the first test of normality and homogeneity of data. The results of the research data were also tested with regression analysis to determine the consistency of each syntax on the learning strategy for one semester. This research was conducted on 30 students of class X at Nurul Jadid Probolinggo High School. Sample studies with cluster random sampling technique.

This data was collected through pretest and posttest conducted before and after all the material in mid-2017. Research results from data related to the influence of Edmodo network social media usage on metacognitive abilities in the analysis using analysis of variance.

3. Research Result

Meta-cognition and achievement abilities are obtained after students take the final test (posttest). The experimental class is a class that is treated using social learning network Edmodo, and grade control is a treatment group that received conventional learning, ie learning without the use of social networks as a medium of learning Edmodo. Metacognitive ability scores of students in the experimental class and the control of normal distribution. Decree of the normal distribution of data normality test after testing, as summarized in Table 1.

Table 1. Summary data normality test results

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
meta_cognitive	media edmodo	.188	15	.163	.951	15	.541
	Conventional	.128	15	.200[*]	.961	15	.709
achievement	media edmodo	.214	15	.063	.914	15	.156
	Conventional	.243	15	.017	.852	15	.019

The tables show that the normal distribution of data. In each group, the group learned Edmodo and conventional media, both for variable metacognitive abilities as well as for the performance variables show greater significance level of α = 0:05.

In addition to the data normality test, the homogeneity test is also carried out the data summarized in Table 2.

Table 2. Homogeneity Test Data

	Levene Statistic	df1	df2	Sig.
meta_cognitive	1.054	1	28	.313
achievement	1.285	1	28	.267

Based on the homogeneity test are summarized in Table 3, it is known that the significant value of the variable meta-cognitive and achievement is equal to 0.313 > 0.05, which means that the variable

data meta-cognitive and learning achievement has the same variance or homogeneous, so that different test in both groups could be implemented.

To answer one of three questions researchers about is there any difference in the ability of meta-cognitive students learn to use the media social network Edmodo with students who studied with conventional methods without the use of a medium of learning, the researchers conducted a study in the form of analysis in order to find a different test on the two treatments mentioned above. The results of the analysis are summarized in table 3.

Table 3. Summary of results of different results of cognitive meta abilities

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
meta_cognitive	1.054	.313	-8.729	28	.000	-8.867	1.016	-10.947	-6.786
			-8.729	27.198	.000	-8.867	1.016	-10.950	-6.783

At first the problem formulation, the researchers asked a question that states are their differences in the results of the metacognitive ability of students to learn to use social media network Edmodo with students who learn using conventional methods. In the results of this study indicate that there are differences in the meta-cognitive abilities of students learning with social media network Edmodo with students who studied conventionally. The data in Table 4 shows that the level of significance of different test results showed $0.000 < 0.005$. Learning media is an important factor in fostering students' interest in learning and cognitive abilities, because learning that originally felt boring, became more interesting and enjoyable[7]. In addition, the students' metacognitive ability is measured using an assessment rubric metacognitive skills[8].

In accordance with the second goal of this study, the researchers tried to test differences in the achievement of students who learned to use Edmodo social media with students who study with conventional methods, so the results of the analysis are summarized in table 4.

Table 4. Summary of results of different test results of student achievement

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
achievement	.990	.328	-3.293	28	.003	-2.733	.830	-4.433	-1.033
			-3.293	25.347	.003	-2.733	.830	-4.442	-1.025

For the needs of researchers' questions about improving cognitive meta abilities and student learning achievement through learning using Edmodo social media, the researchers supplemented this study by examining the effect of learning interactions using Edmodo social media on cognitive meta abilities and student achievement. The results of analysis of data collected through this study are summarized in Table 5.

Table 5. Summary results of analysis of variance

	Sum of Squares	df	Mean Square	F	Sig.
meta_cognitive	589.633	1	589.633	76.199	.000
	216.667	28	7.738		
	806.300	29			
Achievement	56.033	1	56.033	10.845	.003
	144.667	28	5.167		
	200.700	29			

In the results of the analysis to answer the question is there a learning interaction using Edmodo network social media on cognitive meta abilities and student learning achievement has been answered through table 5. It is explained that there is a significant value of 0.000 <0.005 for the influence of learning using Edmodo learning media on students' metacognitive abilities. While similar results are shown in Table 5, for the learning interactions using Edmodo instructional media on student achievement by 0.003 <0.005.

Metacognitive skills have two components; a) metacognitive knowledge (metacognitive knowledge) and b) metacognitive skills (metacognitive skills). Metacognitive knowledge related to declarative knowledge, procedural knowledge, and conditional knowledge, while the cognitive skills associated with planning skills, prediction, monitoring, and evaluation[9].

4. Conclusion

There are significant differences between students' ability to learn using Edmodo social media with students who study conventionally. In addition, the results of the analysis in the formulation of the second, it was found that there are differences in learning achievement between students who learn using Edmodo social media with students who studied conventionally. Answering the third question, the subject is the interactive influence of Edmodo social media on cognitive meta abilities and student learning achievement.

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