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The Implementation of Project Based Learning Model Assisted with WhatsApp Messenger

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Abstract: This study aims to determine the effect and effectiveness of the Project Based Learning (PjBL) model assisted with WhatsApp Messenger compared to the Problem Based Learning (PBL) Model, in terms of the creative thinking skill of high school students in physics learning. This study used quasi experimental model with non-equivalent control group design. The data were analyzed by using independent samples t-test and effect size test. Based on the tests, it can be concluded that there are significant effect on the implementation of PjBL model assisted with WhatsApp Messenger on the creative thinking skill of high students in physics learning and PjBL model assisted with WhatsApp Messenger is more effective than the PBL model.

Keywords: creative thinking skills, effect size, PBL, PjBL, WhatsApp Messenger

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INTRODUCTION

Education also becomes one of the most aspects to improve the quality of human resources to support the nation's progress. However, the ranking of Indonesian education is still low, as indicated by the results of the 2015 Program for International Student Assessment (PISA) study Indonesia ranked 69th of 76 countries, while the results of the Trends in International Mathematics and Science Study (TIMSS) study showed Indonesian students were in rank 36 of 49 countries in terms of conducting scientific procedures. Therefore efforts are needed to improve the ranking of education, especially physics subjects. What happen with physics? In physics, students are presented in wide range for one topic and also there are mathematical skill needed. The solution in improve education in Indonesia is not only from general knowledge, for examples are concepts, principles, laws, and many others, but also procedural knowledge (how to get the information, science processes, scientific working ability, and creative thinking skill (Mumford, *et al.*2012; Madjar, *et al*, 2011; Tierney & Farmer, 2010; Ma, 2009).

Learning activities by considering creative thinking skills can create something new in the form of ideas and real works, and of course to engage creative thinking skill in class, we need proper learning models to teach physics combined with technology Aunillah, 2018). In thinking ability, students have to reach creative thinking aspects such as Fluency, Flexibility, Originality, and Elaboration. The alternative learning model are expected to improve students' creative thinking skills towards physics learning is PjBL model. PjBL is an innovative learning approach, which emphasizes contextual learning through complex activities (Efstratia, 2014). The focus of learning lies in the concepts and core principles of a study discipline, involving students in investigating problem solving and other meaningful tasks, giving students the opportunity to work autonomously to construct their own knowledge and reach the peak of producing products real (Efstratia, 2014).

The learning model is also inseparable from technology to make the learning process more enjoyable, motivate learning, learning in everywhere and everytime, and increase student enthusiasm. The engagement of technology in learning process is a must, because nowadays the students are belong to Z generation who live together with technology, escpesially social media (WhatsApp Messenger). Beside that, previous study just discussed how WhatsApp Messenger effect critical thinking skill (Kustijono & Zuhri, 2018), not discuss about creative thinking skill.

Based on the description before, this study is concern to engage WhatsApp Messenger in learning process, in this case PjBL model. Why we choose WhatsApp Messenger, it’s just because WhatsApp Messenger is one of popular social media to communicate, especially students, and there we can send messages, photos, videos, voice notes, and many others. Besides that, based on simple research, every students have WhatsApp Messenger. So that by this social media the learning process can run well even they are at home, there is no teacher, or even not in school time.

In this study, the teacher gave a project which in its implementation was controlled through WhatsApp Messenger. The students had to send a video to make the project and ask the problems faced, then all the problems faced by students were discussed in presentation activities to add insight in understanding the material study. The aims of this study are to determine whether there is a significance effect or no of

the implementation PjBL model assisted with WhatsApp Messenger in terms of the creative thinking skill of high school physics students, and determine the effectiveness in terms of the creative thinking skill of high school physics students, and also identify the effectiveness of PjBL model compared to the Problem Based Learning model.

METHOD

This study was experimental research consisting of two samples. The selection of these samples uses the Purposive Sampling method. Before doing the study, a pretest was conducted to determine the students' initial abilities and also for sampling. The class with low pretest results is used as the experimental class sample and the high one is used as the control class sample. The study is non-equivalent control group design. Data collection methods in this study include observation, documentation and tests. The source of the data came from the assessment by the researcher, which is pretest and posttest. Data analysis techniques to answer the problems in this study are prerequisite analysis, hypothesis testing using independent samples t-test and effect size test using SPSS 24.

In accordance with the problems previously stated, the type of research used in this study is experimental research. Experimental research is a treatment that is used to find the effect of certain treatments on others in controlled conditions (controls) in the study. The sample in this study was divided into two groups, the experimental class and the control class, the research design is as follows:

O_1	X_1	O_2
O_3	X_2	O_4

Figure 1. Research Design

With: O_1 is pretest of experiment class before implementation, O_2 is postest of experiment class after implementation, O_3 is pretest of control class before implementation, O_4 is posttest of control class after implementation, X_1 is implementation PjBL assited with *WhatsApp Messenger in experiment class, and* X_2 is implementation PBL in control class.

The population of the this study were eleven grade of senior high school student. The sample consisted of 32 eleven grade students. The measurement instruments used in this study were:

1. Observation sheet for managing PjBL models assisted by WhatsApp Messenger
2. Observation sheet for managing the Problem Based Learning Learning model

The data were also tested the normality using normal distribution of the analyzed data. Homogeneity test also used to ensure the sample was homogeneous.

RESULT AND DISCUSSION

The first case in this study was whether there is a significance effect or no of the implementation PjBL model assisted with WhatsApp Messenger in terms of the creative

thinking skill of high school physics students. To answer this problems the hypothesis was tested by using Independent Samples T-test. But, the datas have the normality and homogeneity test. In this study, the normality test used Kolmogorov-Semirnov. The results of the normality test using Kolmogorov-Semirnov can be seen in Table 1. Based on Table 1, the datas were normally disributed. Beside that, based on homogenity test the datas were homogeneus (see Table 2).

Table 1. Kolmogorof-Smirnov Normality Test

Test	Class	Kolmogorov-Smirnov			Conclusion
		Statistic	df	Sig.	
Pretest	Experiment	.139	30	.141	Normal
	Control	.137	30	.158	Normal
Posttest	Experiment	.156	30	.059	Normal
	Control	.154	30	.069	Normal

Table 2. Test of Homoneneity of Variance

Description		Levene's Statistic	df1	df2	Sig.
Pretest	Based on Mean	.005	1	58	.944
	Based on Median	.015	1	58	.902
	Based on Median and with adjusted df	.015	1	57.961	.902
	Based on trimmed mean	.004	1	58	.950
Posttest	Based on Mean	.735	1	58	.395
	Based on Median	.506	1	58	.480
	Based on Median and with adjusted df	.506	1	53.512	.480
	Based on trimmed mean	.693	1	58	.409

Because of the datas were normally distributed and homogeneous, to test the hypotesis used independent samples t-test. From Table 3, we can conclude that student's creative thinking skill in experiment class is higher than in control class. From the significance value (sig. <0.05) also known that PjBL model assisted with WhatsApp Messenger gave the significant effect to the student's creative thinking skill.

Table 3. 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
Equal variances assumed	.735	.395	-4.470	58	.000	-8.167	1.827	-11.824	-4.509

Equal variances not assumed	-4.470	56.525	.000	-8.167	1.827	-11.826	-4.507

The second case was also identify the effectiveness of PjBL model assisted with WhatsApp Messenger compared to the PBL model of experiment and control class. Based on Table 4, it can be concluded that PjBL model assisted with WhatsApp Messenger is higher than PBL. So, it indicates that PjBL model assisted with WhatsApp Messenger is more effective than PBL.

PjBL model assisted with WhatsApp Messenger has the significant effect and also more effective because by using WhatsApp Messenger in learning process, students were able to learn and ask everything in it every where and everytime while doing their project. These results also in line with previous study. Previous study stated that PjBL assited with Technolgy (in this case social media, such as instragam, WhatsApp Messenger, and etc) has the effect to the students' creative thinking skill (Gregoric & Haglund, 2018; Kustijono & Zuhri, 2018; Ardika, *et al.*, 2016).

CONCLUSION

Based on data analysis, it can be concluded that that there is a significant effect on the implementation of PjBL model assisted with WhatsApp Messenger on the creative thinking skill of high school physics students and PjBL model assisted with WhatsApp Messenger is more effective than the PBL model.

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