

# The Effect of Project Based Learning Assisted with Flashcards towards Students' Learning Outcomes in Learning Pencak Silat

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## Abstract

**Background:** Motion-based learning, especially Pencak Silat material taught at the Senior High School level always presents challenges for Physical Education (PE) Teachers.

**Objectives:** This study aimed to investigate the effect of project-based learning assisted with flashcards on students' learning outcomes in learning Pencak Silat.

**Methods:** Quasi-experimental was used as a research design by conducting pretest and posttest. There were 312 eleventh-grade students in this study, which was conducted at Senior High School of Laboratorium Universitas Pendidikan Ganesha (Undiksha) and Senior High School 1 Sukasada. A simple random sampling technique was performed to select the sample of this study. One hundred twenty students were chosen as a research sample and divided into experimental and control groups. The data were collected by conducting pre-tests and post-tests. The instrument used in this study was the basic attitudes test of *Pencak Silat*. The collected data were analyzed quantitatively through inferential statistics (independent sample t-test) with the assistance of SPSS 22.

**Results:** The results showed a significant difference between the post-test gained by the experimental group treated by project-based learning assisted with flashcards and the control group treated by conventional education. Sig proved it. (2-tailed) the post-test data was 0.01, indicating that the significant value was less than 0.05 as consideration. The effect size found through the calculation of Eta Squared proposed by Cohen was 0.08, categorized as a high level.

**Conclusion:** It could be concluded that there was an effect of project-based learning assisted with flashcards towards students' learning outcomes in learning Pencak Silat since this study is focused on learning.

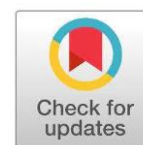
**Keywords:** flashcard, pencak silat, project-based learning.

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## INTRODUCTION

A traditional learning process has been familiar in education, considering that it has been widely implemented in all educational fields. Nowadays, the education system has been developed along with the rapid development of technology and information. It transformed the traditional learning process into a modern learning process by providing a real learning experience for students. [Efstratia \(2014\)](#) states that a traditional learning process is a well-known learning model in education, but it has recently transformed into a modern learning model. This learning process focuses on building an individual by developing their ability through a real learning experience relevant to their daily lives. It also demands students to remember, understand, criticize, and have a creative attitude in achieving the learning goals relevant to the industrial era 4.0 ([Vai et al., 2019](#)). It shows that modern learning emphasizes students' comprehension and practical activities to provide students with real learning experiences.

This phenomenon also occurs in Indonesia, particularly in the learning process of Physical, Sports, and Health Education, commonly known as PJOK. PJOK is one of the lessons where its learning process is conducted by involving students in practical activities. The learning process in PJOK is designed in the form of practice to assist students in understanding the material they learn; for instance, students are directly involved in sports or games ([Wahyudi et al., 2021](#)). [Sari & Sutapa \(2020\)](#) argues that PJOK is a learning subject that programs physical activities to help students achieve their learning objectives. Physical activities can be in the form of games, competitions, and other sports that benefit students' mental and physical health. A similar perception is also shown by [Lumpkin \(1998\)](#), PJOK is a learning process that leads an individual to have a learning experience through physical activity, which is beneficial for mental and physical health and improves the social skills of that individual.

A successful learning process in PJOK is indicated by the involvement of the students during the learning process, and their comprehension and learning outcomes are used as a measurement ([Linse et al., 2014](#)). It is along with the goals of modern learning in the 21st century where the learning process is successful if the students have been involved and participated actively in the classrooms. Students are also required to connect the concepts they learn with their daily lives ([Baran et al., 2018](#)). Therefore, teachers must implement a learning strategy centered on students' active participation as a characteristic

of modern learning in the 21st century, where students are more active than teachers in the learning process itself (Indriani, 2021).

Pencak Silat is one of the sports adapted as a learning topic taught in PJOK. Efriwaldi (2020) states that Pencak Silat is one of the sports branches that can be taught by the teachers in PJOK, which gives some benefits: maintaining students' physical and mental health, building students characters and behaviors in the society. Suwiwa (2021), regard Pencak Silat as a subject that develops social interaction among the students, which will improve and develop students' character. Indirectly, Pencak Silat offers students a learning experience that allows them to interact socially and get some benefits for their mental and physical health in forming their characters.

However, a current issue shows that the learning process of Pencak Silat is not conducted optimally as what has been found by the researcher during the preliminary observation conducted at Senior High School of Laboratorium Undiksha and Senior High School of 1 Sukasada. It is found that the learning process is conducted conventionally by implementing teacher-centered learning, which contrasts with the learning model suggested in 21st-century learning. It decreases students' opportunity to have their own spaces for exploring themselves during the learning process. It also reveals that many students cannot achieve a minimum standard of passing grade in the Pencak Silat learning process. It can be a severe problem since teacher-centered leads students to become passive participants, limiting them from achieving the learning objectives, including decreasing their learning outcomes (Menggo et al., 2019).

Teachers must be able to apply an innovative learning model and strategy for conducting the 21st-century learning process. Project-based learning is one innovative learning model that teachers can use in their classrooms. Project-based learning is a learning model aiming to improve students' critical thinking and problem-solving skills related to real-life problems by designing or finishing a project (Ramadhan et al., 2020; Treadwell, 2018). Gubacs (2013) states that project-based learning is underlined by a student-centered learning approach where the students are directly involved and responsible in the whole learning process. At the end of the learning process, students should produce real work as a project underlined by a problem (Bafadal & Haetami, 2021).

Implementing a learning model or strategy can be optimal if combined with an appropriate learning media. Ramdhani & Muhammadiyah (2015) stated that successful

learning is determined by two essential components: learning strategy and learning media. Those components are inseparable and interrelated. It means that using and selecting a particular learning strategy is related to the learning media used in the classrooms. Therefore, combining an appropriate learning media can optimize the learning model or strategy implementation.

It is a unique learning media that can stimulate students to comprehend the learning materials (Ginting & Rosmaini, 2020). Khairunnisa et al. (2022) add that flashcards improve learning activities and students' cognition by remembering and observing pictures used to illustrate the materials they learn. Anggraini et al. (2019) reveal that using flashcards to improve students' writing report ability is effective and significantly influences their writing product. Khairunnisa et al. (2022) show that the combination of flashcards and problem-based learning effectively improves students' creative thinking during the learning process of environmental pollution. Flashcards can be selected as a learning medium for optimizing an innovative learning strategy.

However, most of the previous studies were conducted to determine how the combination of flashcards with other learning models affects learning activities, students' cognition, and creative thinking. Gunawan et al. (2017) found that project-based learning assisted with virtual media effectively improved students' creativity through various learning activities. Chen et al. (2019) conducted a study revealing that project-based learning explored students' creativity, directly increasing their creative thinking skills. Mafruudloh & Fitriati (2020) also showed that project-based learning improved students' cognition by improving their speaking skills. A limited study still focuses on the effect of project-based learning assisted with flashcards on students' learning outcomes in Pencak. Therefore, this study investigates the effect of project-based learning assisted with flashcard students' learning outcomes in learning Pencak Silat.

## METHOD

### Study Design and Participants

This study used research design by conducting pre-test and post-test control group design. The study was conducted in Senior High School of Laboratorium Undiksha and Senior High School of 1 Sukasada. The population of this study was 312 eleventh-grade students, of which there were only 120 students consisting of 67 female students and 53 male students aged 16 to 17 years old selected as the study sample. They were selected by

using a simple random sampling technique. The sample was divided into a control group and an experimental group. The treatment was given at the same time and portion for each group. Project-based learning assisted with flashcards was implemented in the experimental group; meanwhile, the control group was only treated with a conventional learning strategy. The pre-test was conducted for both groups after the treatment of conventional learning. Then, the experimental group was treated by project-based learning assisted with flashcards; meanwhile, the control group was still treated using conventional learning. The post-test was conducted after the treatment.

### Research Instruments

The present study collected the data through tests. The test was done to get the pretest and posttest data. The instruments used were multiple-choice tests and performance test rubrics.

### Data Analysis

The result of each test was collected and then analyzed quantitatively using inferential statistic analysis, particularly the independent sample t-test. The analysis was assisted by using SPSS 22.0.

## RESULTS

Homogeneity and normality tests were conducted before the gained data were analyzed using inferential statistical analysis. Those tests were conducted to determine whether the gained data had a normal distribution, and homogeneous Saphiro-Wilk was used for testing the data's normality and homogeneity since the sample of this study was less than 100. The pre-test data were first tested for normality and homogeneity. The results showed that the data were normally distributed by considering Sig. 0.275 for the control group and 0.137 for the experimental group indicated that Sig.>0.05. The homogeneity test also showed that the data were homogenous, as indicated by Sig. 0.336 and Sig. 0.567, which meant that Sig. > 0.05. The data of normality and homogeneity test results can be seen in [Table 1](#).

**Table 1.** The Result of Normality and Homogeneity Test of Pretest

Data	Statistical Test	df	Sig.
Control Group	Saphiro-Wilk	7	0.275
	Levene	1	0.336
Experimental Group	Saphiro-Wilk	4	0.137
	Levene	9	0.567

Furthermore, an independent sample t-test was conducted to test the hypothesis of this study on the data collected from the pre-test, which was presented in [Table 2](#).

**Table 2.** Independent Sample t-Test of Pre-test

	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference
Score Equal variances assumed	1.809	.117	.436	120	.227	1.613
variances not assumed			.576	32.320	.227	1.870

[Table 2](#) indicated no significant difference between the control and experimental groups before the treatment. It could be seen from the Sig (2-tailed), which was at 0.227. It was higher than 0.05, meaning the significant value was higher than the consideration at 0.05.

A post-test was conducted after the treatment of project-based learning assisted with flashcards was given to the experimental group; meanwhile, the control group was still treated using conventional learning. The post-test result was collected, and normality and homogeneity tests were conducted to check validity and reliability. The normality test showed that the Sig. was at 0.11 and 0.21, which meant that the significant value was higher than 0.05. It indicated that the data had a normal distribution. The homogeneity test revealed that the data were homogenous since the Sig. was 0.74 and 0.98. It meant that the Si. > 0.05. It achieved a higher significant value than the consideration 0.05. The result is presented in [Table 3](#).

**Table 3.** The Result of Normality and Homogeneity Test of Post-test

Data	Statistical Test	df	Sig.
Control Group	Saphiro-Wilk	7	0.11
	Levene	1	0.74
Experimental Group	Saphiro-Wilk	4	0.21
	Levene	9	0.98

In addition, the result of the independent sample t-test from the post-test is presented in [Table 4](#).

**Table 4.** Independent Sample t-Test of Post-test Result

	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference
Score Equal variances assumed	11.667	.011	2.234	120	.001	1.2511
variances not assumed			2.147	32.320	.008	1.251

[Table 4](#) presented that Sig. (2-tailed) of the post-test data was 0.01. It meant that the significant value was less than 0.05. It indicated a significant difference between the

experimental group treated by project-based learning and the control group treated by conventional learning. The result inferred a significant effect from implementing project-based learning towards students' learning achievement in learning Pencak Silat, considering that the effect size was also calculated using the Eta Squared proposed by Cohen. The effect size was found at 0.8, which indicated that it has a high-level effect.

## DISCUSSION

The results showed a significant difference between the post-test result of the experimental group and the control group, as indicated by Sig. (2-tailed) was at 0.01. It was less than the consideration 0.05, meaning there was a significant difference since the consideration was if Sig < 0.05. It indicated an effect of project-based learning assisted by flashcards on students' learning outcomes in Pencak Silat since the effect size was high, with 0.08 points. The result of this study supported the conceptual study conducted by [Simonton et al. \(2021\)](#), which viewed that project-based learning has potential in physical education. Project-based learning was found to be a potential learning model that simultaneously improved students' learning understanding and initiative.

This finding was also relevant to the previous study by [Hastie et al. \(2017\)](#), which revealed that project-based learning was effective in the fitness education unit. It was found that there was a significant difference between the two control groups during the post-test. The significant effect found during the experimental group's post-test showed that project-based learning assisted with flashcards could help students better understand. It indicated that project-based learning assisted with flashcards was more beneficial than conventional learning; as stated by [Treadwell \(2018\)](#), using project-based learning was an alternative way of constructing more meaning from the content learned by students since it was not presented in conventional manners. The problem-solving in project-based learning increased students' active participation, exploring their problem-solving skills in overcoming problems in Pencak Silat. It attracted their attention to explore the technique in Pencak Silat, where they were allowed to gain more knowledge through the provision of flashcards during the learning process.

The previous study conducted by [Schiff \(2020\)](#) was supported by the findings of this study, considering that both studies investigated the effect of project-based learning on students' creativity in learning Pencak Silat, mainly focusing on the Prasetya technique. The working group activity allowed students to share and explore the information they

gained about *the Prasetya* technique. Using flashcards as the learning media helped students memorize the information faster than conventional learning. The distribution of the questionnaire showed that the students' creativity increased significantly after the treatment of project-based learning since the average score of the students before the treatment was 3.30, then increased to 4.36. [Suwiwa \(2021\)](#) revealed that implementing project-based learning in Physical, Sports, and Health Education was effective during blended learning, particularly in teaching the Pencak Silat subject. It was found by considering the significant improvement made by the students from the pre-test to the post-test. This finding was supported by the result of a recent study, which was also relevant to the previous study, which pointed out that project-based learning was effective, presented at 82% categorized as excellent to be used in the learning process of Physical, Sports, and Health Education ([Bafadal & Haetami, 2021](#)).

The result of this study confirmed a similar previous study conducted by [Ginanjari & Tarigan \(2018\)](#), which shows that project-based learning is effective and significantly affects students' creativity. The difference between the latest research and this previous research lies in the treatment carried out during the trial, where the previous research applied project-based learning as a treatment for student creativity without the help of learning media. Meanwhile, a recent study focused on treating students' understanding through implementing project-based learning assisted with flashcards as a learning medium. The improvement of students' understanding affected their Pencak silat learning outcomes.

In addition, the finding of this study was interrelated with the assistance of flashcards as a learning media. The result of this study supported the previous study conducted by [Vai et al. \(2019\)](#), which investigated the effect of using flashcards in teaching volleyball during sports class. It was revealed that flashcards were reliable and valid for learning, but further experiments still needed to be conducted. Therefore, this study could become further research whose findings supported the previous study.

## CONCLUSION

The investigation conducted in this study shows a significant difference between the students taught by project-based learning assisted with flashcards and the students taught by conventional learning. It can be concluded that there is a significant influence contributed by project-based learning assisted with flashcards on students' learning



outcomes. It is suggested that other researchers conduct further research that focuses on other learning factors and aspects, such as students' learning motivation, creativity, collaborative skills, and others that also influence the learning outcomes in other learning subjects and educational levels. It is considered due to the limitation of this study on the effect of project-based learning assisted with flashcards on students' learning outcomes in learning Pencak Silat.

### CONFLICT OF INTEREST

The author officially certifies that there are no conflicts of interest with any party with respect to this research.

### AUTHOR'S CONTRIBUTION

I Gede Suwiwa is the lead author of this study responsible for all writing processes. I Ketut Budaya Astra interprets data analysis from statisticians. I Ketut Yoda contributed to the interpretation and drew conclusions. I Made Satyawan refine data analysis.

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