Kinestetik : Jurnal Ilmiah Pendidikan Jasmani 9 (2) (2025)
Kinestetik : Jurnal Ilmiah Pendidikan Jasmani
https://ejournal.unib.ac.id/index.php/kinestetik/index
DOI : 10.33369/jk.v9i2.40335

The Effect of Learning Model and Motivation on Long Jump Learning Outcomes

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Article Info

Article History :

Received : March 2025

Revised : June 2025

Accepted : June 2025

Keywords:

Kinestethic,
Learning Style,
Movement Skills,

Abstract

This study aims to analyze the effect of Visual, Audiotorial, and Kinesthetic learning styles on the learning outcomes of movement skills of grade II students of Dobo Christian Elementary School 1, Data collection was carried out using a questionnaire. The population in this study amounted to 60 students and a sample of 36 students determined by random sampling technique or randomly. This research is an experimental expo-facto research, the analysis technique used uses inferential analysis techniques. The results obtained are that there is an influence between Visual, Audiotorial, and Kinesthetic learning styles on the learning outcomes of students' movement skills as evidenced by statistical analysis which is 6.926. Thus, Visual, Audiotorial, and Kinesthetic learning styles have a positive effect on student movement skills learning outcomes as evidenced by statistical analysis tests.

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ISSN 2685-6514 (Online)
ISSN 2477-331X (Print)

INTRODUCTION

Creative thinking skills are important to develop through learning so that students have the ability to find and determine new things in dealing with all problems or problems and are able to find many possible answers to a problem. (Farida Maria Ulfaa, M Asikin, Dwidaati, 2019) By choosing and applying the right learning model, for example by providing a problem or events that can stimulate students' creative thinking skills, students can think and build their own knowledge in their minds so that it will be longer to remember. As stated (Suryadi, Irianti and Septiarini, 2021), that creative thinking ability is a thought process to reveal new relationships, see things from a new perspective, and form new combinations of two or more concepts that have been previously mastered.

Creative thinking skills help learners create new ideas based on existing knowledge to solve problems from different perspectives. In accordance with prevailing education standards, teacher competencies include not only academic aspects but also interpersonal skills and a commitment to continuous development.

Teacher competence is a collection of abilities that must be possessed by an educator to carry out their duties effectively, which includes knowledge, skills, and attitudes that support a quality learning process. (Nur and Fatonah, 2023) These competencies are recognized as the core of teacher professionalism and are key in achieving set educational goals (ALAN and Güven, 2022) In accordance with applicable education standards, teacher competencies include not only academic aspects but also interpersonal skills and commitment to continuous development(Paraniti and Suma, 2022). According to Emy crisnawaty in (Safitri, Sabillah and Citra, 2023) suggests that competent teachers can carry out their tasks in such a way that educational goals can be achieved so that being a teacher is a profession that requires special skills and is not suitable for everyone because teaching, training, and education are part of the job description(Sulastri, Fitria and Martha, 2020). Teachers, as an integral part of the learning process, play an important role in promoting education reform despite the many obstacles face

The learning model that can be used is to improve students' creative thinking skills is the Problem Based Learning model, which develops students' potential to be sensitive to social problems that occur in society and has critical thinking to solve problems in everyday life and this model also affects student learning outcomes in cognitive, affective and psychomotor aspects. (Ferdi Hasan Lubis, Samsuddin Siregar, Ahmad Pippo Perangin-Angin, 2024) The Project Based Learning model directs students to problems directly, puts responsibility on students then during the project completion process involves group work which indirectly makes students active in bringing up creative ideas and is trained to act and think creatively. Project Based Learning can increase students' confidence, motivation to learn, and creative abilities. One of the characteristics that effective Project Based Learning must have in learning is "requires the use of creative thinking, critical thinking, and information skills to investigate, draw" which means that Project Based Learning requires the use of creative thinking, critical thinking, and the ability to investigate and draw information. The model used is a model that can encourage students to be actively involved in the learning process.

METHODS

The research method used in this research is experimental. This method is used on the basis of the consideration that the nature of experimental research is to try something to determine the effect or effect of a treatment or *treatment*. In addition, researchers want to know the effect of the independent variable on the dependent variable observed regarding this experimental method, experimentation is a way to find a cause-and-effect relationship (casual relationship) between two factors that are deliberately caused by the researcher by reducing or setting aside other factors that interfere.

The variables contained in this study consist of two independent variables, namely, Project Based Learning and Problem Based Learning while Motivation is included in the attribute independent variable and is divided into two classifications, namely high and low motivation. The dependent variable in this study is long jump learning outcomes.

This research was conducted at Senior High School (SMP) Negeri 1 Aru Islands. With a population of 25 people. The data analysis technique used was a 2x2 *treatment by level* experimental research design, so hypothesis testing was carried out using a two-way *analysis of variance* (ANOVA).

RESULT

The next study is to describe and present the results of the analysis. This study consists of three variables, namely the dependent variable is the learning outcome of the long jump squatting style, the independent variable is the project-based learning model and the problem-based learning model, and the moderator variable is learning motivation (high and low).

After following a series of learning processes that have been programmed by dividing students into two groups, namely groups of students taught with the project-based learning model method and groups of students taught with the problem-based learning model, data on the learning outcomes of the long jump squatting style, in the form of scores used to be analyzed from the average assessment results from the three evaluators. Each group consists of students who have high learning motivation and students who have low learning motivation. The high and low learning motivation of students is measured by giving a questionnaire / learning motivation questionnaire to students. Based on the results of the research conducted, obtained normality test data using the Liliefors test at a significant level $\alpha = 0.05$. Summary of normality test of long jump data in each group.

Table 1. Summary of Normality Test Results for Long Jump Data in Each Group.

No.	Group	N	$L_{0\text{-count}}$	L_{table}	Conclusion
1	A_1	20	0,088	0,190	Normal
2	A_2	20	0,155	0,190	Normal
3	B_1	20	0,078	0,190	Normal
4	B_2	20	0,161	0,190	Normal
3	A_1B_1	10	0, 133	0,258	Normal
4	A_1B_2	10	0,131	0,258	Normal
5	A_2B_1	10	0,127	0,258	Normal
6	A_2B_1	10	0,172	0,258	Normal

From the table above, it can be seen that the $L_{o\text{-count}}$ of each group is smaller than $L_{(table)}$ ($L_{(o\text{-count})} < L_{(table)}$), this means H_0 is accepted. Thus it can be concluded that the samples from each group come from a normally distributed population. Another requirement that is carried out is testing the homogeneity of variance.

Table 2 Summary of Homogeneity Test Results of Long Jump Results Data

Group	Variance	F_{count}	F_{table}	Conclusion
A_1	24,51	1,799	1,903	Homogeneous
A_2	13,63			

$F_{count} = 1.799 < 1.903 = \chi^2_{table}$ at the significance level $\alpha = 0.05$, then H_0 is accepted which means the two groups of data come from homogeneous populations.

The homogeneity of variance test was then conducted on four treatment groups, namely Group ($A_1B_{(1)}$), ($A_1B_{(2)}$), (A_2B_1), and ($A_2B_{(2)}$). The test results are as follows.

Table 3. Summary of Homogeneity Test Data on Long Jump Results in Four Treatment Groups

Group	Variance	Combined Variance	χ^2_{count}	χ^2_{table}	Conclusion
A_1B_1	8,99	11,13	1,688	7,815	Homogeneous
A_1B_2	7,21				
A_2B_1	12,10				
A_2B_2	16,22				

Looking at the table above, it is found that $\chi^2_{calculated} < \chi^2_{table}$, namely $1.688 < 7.815$ at the significance level $\alpha = 0.05$, thus H_0 is accepted, which means that the four data groups come from a homogeneous population. Because both requirements have been met, we can continue with the analysis of variance (ANOVA) test.

Hypothesis testing was carried out using a two-way analysis of variance (ANOVA) technique with a 2 x 2 *treatment by level* design and then continued with the Tukey test to determine which group had better long jump results. The following appendix presents the results of the ANOVA calculation.

Table 4. Summary of ANOVA Calculation Results at the $\alpha = 0.05$ level

Source of Variance	Db	JK	RJK	F_{count}	F_{table} $\alpha = 0.05$
Inter A	1	126,02	126,02	4,962	4,11
Inter B	1	55,23	55,23	11,322	
AxB interaction	1	198,02	198,02	17,791	
In	36	400,70	11,13	-	-
Total	40	779,98	-	-	-

Based on table 4, because there is an interaction between learning outcomes and motivation, a further test is carried out, namely the Tukey test because the number of samples is the same. Further tests are intended to find out about: (1) differences in Learning Outcomes of Squatting Style Long Jump Skills in students taught using PjBL and taught with PBL for students who have high motivation, and (2) differences in Learning Outcomes of Squatting Style Long Jump Skills in students taught using PjBL and taught with PBL for students who have low motivation. A summary of further test results can be seen in the following table:

Table 5. Summary of Tukey Test Calculation Results

No.	Compared Group	$Q_{calculate}$	Q_{table}	Description

1	A_1B_1 with $A_2B_{(1)}$	7,58	4,33	Significant
2	A_1B_2 with $A_2B_{(2)}$	0,85		Not Significant

a. Differences in Learning Outcomes of Squatting Long Jump Skills Between the project-based learning model and the problem-based learning model

From the results of the analysis of variance at the significance level α = 0.05 in the column of the source of variance between A obtained $F_{count} = 4.962$ and $F_{table} = 4.11$ so that $F_{count} > F_{table}$ so that H_0 is rejected which means that overall there is a real difference between the project-based learning model and the problem-based learning model on the learning outcomes of squatting long jump skills.

b. Interaction between Learning Methods and Learning Motivation on Squatting Style Long Jump Learning Outcomes

Based on the results of the analysis of variance on the interaction between learning methods and motivation on the learning outcomes of squatting long jump skills seen in table H.12 anova calculations above, that the price of F_{count} interaction F (AxB) = 17.791 and $F_{table} = 4.11$ so that $F_{count} > F_{table}$ which means H_0 is rejected. This shows that there is an interaction between the learning methods used with motivation on the learning outcomes of squatting long jump skills.

The interaction between learning methods and motivation in its effect on learning outcomes of squatting long jump skills can be visualized graphically as shown below.

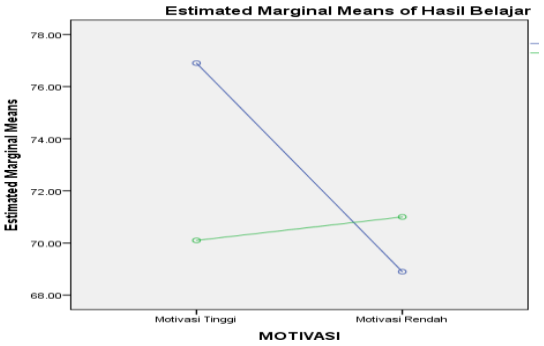

Figure H.7 Interaction between Learning Model and Motivation on Squatting Style Long Jump Learning Outcomes.

Furthermore, based on the test results above, it shows that there is an interaction between variables so that further tests can be carried out with the Tukey test to find out which method provides better learning outcomes for squatting long jump skills between the project-based learning model and the problem-based learning model.

c. Differences in Learning Outcomes of Squatting Long Jump Skills in Groups of Highly Motivated Students Taught with Project Based Learning Model and Problem Based Learning Model.

There are differences in the learning outcomes of squatting long jump skills in groups of highly motivated students taught with the part learning method and those taught with the overall learning method. This is evident from the results of further tests in the analysis of variance (ANOVA) using the Tukey test whose results are as follows.

Table 4.13 Tukey Test Results on Learning Outcomes of Squatting Long Jump Skills in Student Groups with High Motivation Taught with Project Based Learning Model and Problem Based Learning Model

No.	Compared Group	$Q_{calculate}$	Q_{table}	Description

1	A_1B_1 with $A_2B_{(1)}$	7,58	4,33	Significant

Description:
A_1B_1 : High Motivation Project Based Learning Model Group
A_2B_1 : High Motivation Problem Based Learning Model Group

Based on the table, it is known that Q_{count} 7.58 > 4.33 Q_{table}, so H_0 is rejected, which means that there is a significant difference in learning outcomes of squatting long jump skills between highly motivated students taught with the part learning method than those taught with the overall learning method.

The group of highly motivated students taught using the parts learning method has an average score of learning outcomes of squatting long jump skills of $\bar{X}$ = 76.9 better than the group of students taught using the overall learning method with an average score of $\bar{X}$ = 68.90. This means that the hypothesis is accepted so that it can be concluded that the learning outcomes of squatting long jump skills of highly motivated students taught with the section learning method are better than those taught using the overall learning method.

d. Differences in Learning Outcomes of Squatting Style Long Jump Skills in Groups of Students with Low Motivation Taught with Project Based Learning Model and Problem Based Learning Model.

There is no significant difference in learning outcomes of squatting long jump skills in groups of students who have low motivation who are taught with the part learning method and those taught with the overall learning method. This is evident from the results of further tests in the analysis of variance (ANOVA) using the Tukey test whose results are as follows.

Table 4.14 Tukey Test Results on Learning Outcomes of Squatting Long Jump Skills in Student Groups with Low Motivation Taught with Project Based Learning Model and Problem Based Learning Model

No.	Compared Group	$Q_{calculate}$	Q_{table}	Description
1	A_1B_2 with $A_2B_{(2)}$	0,85	4,33	Not Significant

Description:
A_1B_2 : Low Motivation Project Based Learning Model Group
A_2B_2 : Low Motivation Problem Based Learning Model Group

Based on the table, it is known that Q_{count} 0.85 < 4.33 Q_{table}, this means that H_0 is accepted and H_1 is rejected, which means that there is no significant difference in learning outcomes of squatting long jump skills in groups of students who have low motivation who are taught with the part learning method and who are taught with the whole learning method.

Although the average score of learning outcomes of squatting long jump skills in the group of students with low motivation shows that students taught using the part learning method have an average score of $\bar{X}$ = 70.10 lower than students taught using the overall learning method which is $\bar{X}$ = 71. Based on this, it can be concluded that the learning outcomes of squatting long jump skills for groups of students who have low motivation who are taught with the overall learning method are better than those taught using the part method. Although the calculation results do not significantly affect the learning outcomes of squatting long jump skills for groups of students who have low motivation.

DISCUSSION

Based on the results of the research data analysis that has been carried out, namely analysis of variance (ANOVA) and Tukey test, the results are as follows.

The first hypothesis (H_0) which states that there is no difference in learning outcomes of squatting long jump skills between students taught with the PjBL Model and students taught with the PBL Model is rejected. This means that there are differences in learning outcomes in squatting long jump skills between students taught with the PjBL Model and students taught with the PBL model which has been proven statistically. Where in the anova test obtained F_{count} 4.92> 4.11 F_{table} which means there is a significant difference. This difference is also shown from the average score of learning outcomes, where the group of students taught with the Project Based Learning Model ($\bar{X}$ = 73.5) is higher than the group of students taught using the Problem Based Learning Model $\bar{X}$ = 69.95). Based on this, it can be concluded that there are differences in learning outcomes of squatting long jump skills for students taught using the PjBL Model and students taught with the PBL Model where the learning outcomes of squatting long jump skills of students taught using the PjBL Model are better than students taught using the PBL Model.

Testing the second hypothesis shows the interaction between learning methods and motivation on squatting long jump learning outcomes. This is evidenced by the anova test at the α = 0.05 level which shows F_{count} 17.791> 4.11 F_{table}. Based on this statistical test, the hypothesis that there is no interaction between the learning model and motivation is rejected. So it can be concluded that there is an interaction between the learning model and motivation on squatting long jump learning outcomes.

In accordance with the above explanation, it can be concluded that overall the PjBL model has a better effect on the learning outcomes of squatting long jump skills than the PBL model.

The third hypothesis based on the results of further tests using the Tukey test at the α = 0.05 level obtained the price of Q_{count} = 7.58, while Q_{table} = 4.33 (Q_{count} > Q_{table}). Thus, the second hypothesis (H_0) which states that there is no difference in learning outcomes of squatting long jump skills for highly motivated students between students taught using the project-based learning model and those taught with the problem-based learning model is rejected. The statistical test (Q_{count} 7.58 > 4.33 Q_{table}) shows that there is a significant difference in learning outcomes of squatting long jump skills in the group of highly motivated students between those taught with the project-based learning model and those taught with the problem-based learning model. The average score results show that the average score of learning outcomes of squatting long jump skills in highly motivated students taught with the project-based learning model ($\bar{X}$ = 76.9) is higher than the group of students taught with the problem-based learning model ($\bar{X}$ = 68.9). Based on this, it can be concluded that there are differences in the learning outcomes of squatting long jump skills in groups of highly motivated students between students taught using the PjBL model and students taught using the PBL model, where in highly motivated students the learning outcomes of squatting long jump skills taught using the PjBL model are better than students taught using the PBL model.

The fourth hypothesis based on the results of further testing using the tukey test at the α = 0.05 level obtained the price of Q_{count} = 0.85 while Q_{table} = 4.33 (Q_{count} < Q_{table}). Thus, the fourth hypothesis (H_0) which states that there is no difference in learning outcomes of squatting long jump

skills for students who have low motivation between students taught using a project-based learning model and those taught with a problem-based learning model is accepted. The average score results show that the average score of learning outcomes of squatting long jump skills in low-motivated students taught with the PjBL Model ($\bar{X}$ = 70.1) is lower than the group of low-motivated students taught with the PBL model ($\bar{X}$ = 71). Based on this, it can be concluded that there is no significant difference in the learning outcomes of squatting long jump skills in groups of students who have low motivation between students taught using the PjBL model and students taught with the PBL model, although there is a difference that shows the average learning outcomes of squatting long jump skills taught using the PBL model is better than students taught using the PjBL model in students who have low motivation.

CONCLUSION

The study used an experimental method consisting of dependent variables, namely long jump results and independent variables, namely learning methods (PBL and PjBL) and motivation (high and low). Based on the data obtained from the results of the analysis and testing of the research hypothesis, it can be concluded:

1. Students taught with PBL method is better than PjBL method on service learning.
2. There is a significant interaction between learning methods and motivation on long jump.
3. Students taught with the PBL method are better than the PjBL method who have high motivation towards service learning outcomes.
4. Students taught with the PjBL method are better than the PBL method who have low motivation towards service learning outcomes.

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