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The Influence of Project-Based Learning (P5 Activity) on Improving Students' Collaboration Learning Skills

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Abstrak

Metode pengajaran yang efektif sangat penting untuk memfasilitasi perkembangan kognitif, sosial, dan emosional siswa. Salah satu pendekatan yang diusulkan dalam Kurikulum Merdeka adalah Pembelajaran Berbasis Proyek (P5), yang mengajak siswa untuk terlibat langsung dalam proses belajar melalui proyek nyata. Metode penelitian yang digunakan ialah metode kuantitatif kausal dengan populasi siswa kelas 5 SDN Karangesuki 4 dengan jumlah sampel 54 siswa, Teknik analisis data menggunakan uji-t dengan taraf signifikan 5%. T-test yang digunakan adalah separated varian ataupun pooled varian dengan alat hitung berupa SPSS. Berdasarkan hasil penelitian dan pembahasan, dapat dikemukakan beberapa simpulan. Adapun simpulan yang akan dikemukakan dalam penelitian ini adalah sebagai berikut. 1) Terdapat peningkatan ketrampilan kolaborasi antara siswa yang belajar menggunakan pembelajaran berbasis proyek dengan siswa yang belajar menggunakan LKPD (Lembar Kerja Peserta Didik) pada tema "Pemanfaatan Barang Bekas" kelas 5 SDN 4 Karangbesuki Kota Malang. Dilihat rata-rata posttest kelompok eksperimen dengan menggunakan pembelajaran berbasis proyek adalah 19,058 sedangkan rata-rata posttest untuk kelompok kontrol sebesar 14,117. Berdasarkan rata-rata peningkatan ketrampilan kolaborasi belajar siswa tersebut maka dapat disimpulkan bahwa peningkatan ketrampilan kolaborasi belajar siswa lebih tinggi terdapat pada anak yang menggunakan pembelajaran berbasis proyek. 2) Hasil analisis respon siswa ketrampilan kolaborasi belajar didapat persentase hasil akhir respon siswa adalah 81,18% yang tergolong dalam kategori sangat positif.

Kata Kunci: Pembelajaran Berbasis Proyek (P5); Ketrampilan Kolaborasi Belajar Siswa.

Abstract

Effective teaching methods are essential to facilitate students' cognitive, social, and emotional development. One of the approaches proposed in the Merdeka Curriculum is Project Based Learning (P5), which invites students to be directly involved in the learning process through real projects. The research method used is a causal quantitative method with a population of 5th grade students at SDN Karangesuki 4 with a sample size of 54 students. The data analysis technique uses a t-test with a significance level of 5%. The T-test used is a separated variant or pooled variant with a calculation tool in the form of SPSS. Based on the results of the research and discussion, several conclusions can be put forward. The conclusions that will be put forward in this research are as follows. 1) There is an increase in collaboration skills between students who learn using project-based learning and students who learn using LKPD (Learner Worksheets) on the theme "Use of Used Goods" class 5 at SDN 4 Karangbesuki, Malang City. It can be seen that the post-test average for the experimental group using project-based learning was 19.058, while the post-test average for the control group was 14.117. Based on the average increase in students' collaborative learning skills, it can be concluded that the increase in students' collaborative learning skills is higher in children who use project-based learning. 2) The results of the analysis of student responses on collaborative learning skills showed that the final percentage of student responses was 81.18% which was classified as very positive.

Keywords: Project Based Learning (P5); Student Learning Collaboration Skills.

INTRODUCTION

Quality education is one of the main pillars of human resource development. In the context of basic education, effective teaching methods are essential to facilitate students' cognitive, social, and emotional development. One of the approaches proposed in the Merdeka Curriculum is Project Based Learning (P5), which invites students to be directly involved in the learning process through real projects. This learning is designed to improve students' conceptual understanding, collaboration skills, and learning motivation.(Sanga & Wangdra, 2023).

Constructivism theory, pioneered by Jean Piaget and Lev Vygotsky, is the main basis for project-based learning. Constructivism argues that students construct their knowledge through direct experience and social interaction. In the P5 context, students do not just receive information passively but are actively involved in research, discussion, and problem-solving. Through this process, students can relate new knowledge to existing experiences, thereby deepening their understanding.(Musyafak & Subhi, 2023)

As explained in the research results, it is stated that the application of the project-based learning model has great potential to enrich student's learning experiences and prepare them for real-world challenges. With a deep understanding of basic concepts, benefits, and strategies for overcoming challenges, educators can design more meaningful and relevant learning experiences for their students. The project-based learning model is a powerful tool to help students achieve learning outcomes and increase their full potential in education.(Ismail, 2018).

Learning outcomes, which include understanding concepts and academic abilities, are one of the main focuses in education. Research shows that students who engage in project-based learning tend to have better learning outcomes compared to traditional methods. This is due to a more interactive and applied approach, which allows students to integrate knowledge in real contexts.(Solissa et al., 2024).

Learning outcomes are abilities obtained by individuals after the learning process takes place, which can provide changes in behavior in terms of knowledge, understanding, attitudes and skills of students so that they become better than before. This understanding is in line with the definition put forward by Jihad, who said that learning outcomes are the abilities that students obtain after going through learning activities.(Ginanjari et al., 2021). Another definition was put forward by Sudijono in a journal. According to Sudijono, learning outcomes are an evaluation action that can reveal aspects of the thinking process (cognitive domain) and can also reveal other psychological aspects, namely aspects of values or attitudes (affective domain) and aspects of psychomotor skills domain) that are inherent in each student.(Nathaniela & Esfandiari, 2023)

From the various definitions that have been described, it can be concluded that learning outcomes are something that students obtain after they have had a learning experience in the form of changes in behavior, including knowledge, attitudes, and skills. The student learning outcomes are a reflection of student success in the learning process. The level of student learning outcomes is a tool to determine whether a student is experiencing changes in learning or not.(Dewi, 2023)

Collaboration skills are a much-needed competency in the modern world. In project-based learning, students often work in groups to complete assignments. This process develops effective communication, negotiation, and collaboration skills. Vygotsky's social theory emphasizes the importance of social interaction in the learning process, which is relevant in the context of P5. By working together, students learn to respect others' points of view and develop strong interpersonal skills. In other words, collaboration is a form of social process, in which there are certain activities aimed at achieving a common goal by helping each other and understanding each other's activities. 2 Another meaning of cooperation is an effort to achieve a common goal that has been set through the division of tasks or work. , not as a

compartmentalization of work but as a unit of work, all of which is directed at achieving goals. (Ahwan et al., 2023)

Collaboration is a process of cooperation between two or more people to achieve success for both parties which is a form of social process that helps each other in activities to achieve common goals. Collaboration is defined as an activity carried out jointly by various other parties to achieve the desires of a common goal. (Hartina & Permana, 2022)

However, although P5 has a lot of potential, challenges in its implementation remain. Therefore, this research aims to explore the influence of Project Based Learning (P5) on learning outcomes, collaboration skills, and motivation of grade 5 elementary school students. By measuring these three variables, this research is expected to provide deeper insight into the effectiveness of P5 in improving the quality of education at the primary level. In addition, it is hoped that the results of this research can provide practical recommendations for educators in implementing P5 more effectively and efficiently. (Norhikmah et al., 2022)

RESEARCH METHODS

This research aims to determine the effect of project-based learning (p5) on improving students' collaborative learning skills. The type of experimental research used in this research is quasi-experimental research (*quasi-experiment*) (Kusumastuti et al., 2020). In quasi-experimental research (*quasi-experiment*) has a control group design, but cannot function fully to control external variables that influence the implementation of the experiment. This research was carried out at SDN Karangbesuki 4, Malang City. The subjects studied were 5th-grade students at SDN Karangbesuki 4, Malang City. The time for carrying out this research is the even semester of the 2023/2024 academic year. (Syafii, 2023)

The population in this study were all 5th-grade students at SDN Karangbesuki 4, Malang City. The total population is 54 students. Based on the results of the equality test, classes that are assumed to be equivalent can be used as research

samples. Next, the random sampling technique is carried out by drawing lots to get the experimental class and the control class. Based on the results of the drawing, class B1 was assigned as the experimental group and class B2 as the control group. (Anshori & Iswati, 2019)

The hypotheses to be tested in this research are:

Ho: $\mu_1 Y_1 = \mu_2 Y_1$: There is no different influence of project-based learning (p5) on improving students' collaborative learning skills

Ha: $\mu_1 Y_1 \neq \mu_2 Y_1$: There are different influence of project-based learning (p5) on improving students' collaborative learning skills

Information:

μ_1 1Y= Average score of learning achievement of experimental class students (KE)

μ_2 1Y= Average score of learning achievement of control class students (KK)

The data analysis technique used to test the hypothesis is analyzing the differences between two groups of scores. If it is proven that the data collected is normally distributed and is homogeneous or not homogeneous, then to test the hypothesis in this study a t-test will be used with a significance level of 5%. The T-test used is a separated variant or polled variant. Hypothesis testing uses the t-test, there are several formulas used as follows.

Rumus (*separated variants*)

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

or

Rumus (*polled variants*)

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

Information:

- X1 The average score of the experimental group
- X2 The mean score of the control group
- n1 The number of experimental groups
- n2 The number of control groups
- s12 Experimental group variance

s22 Control group variance

Guidelines for using the separated variant and polled variant t-test formulas are as follows:

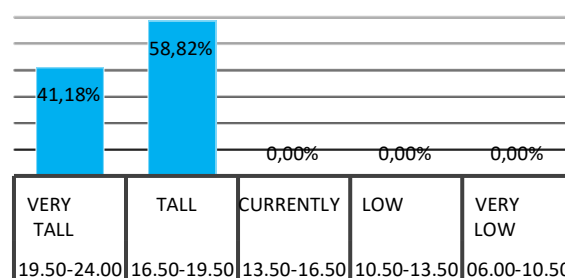
- If the number of students is $n_1 = n_2$, the variance is homogeneous then the t-test formula can be used for both separated variants and polled variants. To see the t-table values, degrees of freedom (dk) = $n_1 + n_2 - 2$ are used
- If the number of students is $n_1 \neq n_2$, homogeneous variance, then the t-test formula with polled variance can be used. To see the t-table values, degrees of freedom (dk) = $n_1 + n_2 - 2$ are used
- If the number of students is $n_1 = n_2$, the variance is not homogeneous. The t-test formula can be used with separated variance and polled variance. To see the t-table values, degrees of freedom (dk) = $n_1 - 1$ or $n_2 - 1$ are used
- If the number of students is $n_1 \neq n_2$, the variance is not homogeneous. For this, a t-test with separate variance is used. The price of t as a substitute for the t-table is calculated from the difference in the price of the t-table with dk ($n_1 - 1$) and dk ($n_2 - 1$) divided by two, and then added to the smallest t price.

To get more accurate results, the t-test analysis was carried out in two ways, namely manually and with the help of the SPSS PC 16.0 for Windows program. If the manual method is used to produce an interpretation, then the tcount must be compared with the ttable with an indicator at a significance level of 5% (0.05). If tcount is greater than ttable ($t_{count} > t_{table}$) then there is a significant difference between the two variables or samples. Meanwhile, if tcount is smaller than ttable ($t_{count} < t_{table}$) then there is no significant difference between the two variables or samples. Meanwhile, the results of the SPSS 16.0 for Windows program output are interpreted by looking at the significance values. A significance figure smaller than 0.05 means that H_0 is rejected and that there are differences in the independent variables between groups. (Unaradjan, 2019)

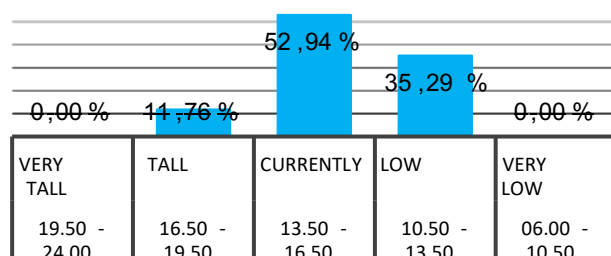
RESULTS AND DISCUSSION

Based on data on the level of collaborative learning skills of 17 students in the experimental group, data on the frequency distribution of post-test scores for learning achievement on the theme "Use of Used Materials" with interactive learning media from the experimental group was obtained. It was found that the student's highest score was 22 and the student's lowest score was 16. Score The average learning achievement using interactive learning media in the experimental group was 19.058. The score categories for experimental class student learning achievement data can be seen in Graph 1 below

Graph 1. Histogram of Experimental Group Learning Achievement



Based on measurement data on the level of collaborative learning skills of 17 control group students, score frequency distribution data was obtained post-test learning achievement on the theme of Yourself with LKPD (Students' Worksheets), it is known that the highest student score is 17 and the lowest score for students is 11. The average score of learning achievement with LKPD (Students' Worksheets) in the control group is 14.117. The score categories for experimental class student learning achievement data can be seen in graph 2 below

Graph 2. Histogram of Control Group Learning Achievement

The prerequisite test calculations are carried out in two tests, namely the normality test and the homogeneity test. Based on the results of the SPSS analysis output, the normality test is shown in the Sig Column. In the Kolmogorov-Smirnov Test, it can be seen that the probability value (Sig. or p-value) for the experimental class = 0.200 and control = 0.180, which are all more than $\alpha = 0.05$. For *Shapiro-Wilk* sig value. For the experimental class = 0.456 and control = 0.549 which is more than $\alpha = 0.05$ so it can be concluded that the data distribution for the control and experimental classes is Normally distributed.

Table 1. Summary of Normality Test with SPSS 16.0

| GROUP | | Kolmogorov-Smirnova | | |
|-----------|------------|---------------------|----|------|
| | | Statistics | df | Sig. |
| POST TEST | Experiment | .135 | 17 | .200 |
| | Control | .174 | 17 | .180 |

The next calculation is a homogeneity test using SPSS 16.0. Based on the results of the analysis output, it shows a significant value of 0.684 because the significant value is > 0.05 , so it can be concluded that the variations in the control and experimental classes are equivalent, which means there is no difference in the variance of the data on improving students' collaboration skills on the theme "Use of Used Goods" between the experimental group and the control group. (homogeneous).

Because the experimental class and control class data were normally distributed and the data was homogeneous, we continued by testing the hypothesis using the t-test. The t-test can be calculated using Ms. Excel 2013 and SPSS 16.0. The t-test was calculated using the Separated Variance formula to obtain a t count of 7.968. The t-test was also calculated using SPSS 16.0 with the following results:

Table 2. Hypothesis Test Results with SPSS

| | | t-test for Equality of Means | | |
|------|----------------------------|------------------------------|--------|----------------|
| | | t | Df | Sig. (2tailed) |
| Mark | Equal variance assumed | 7,964 | 32 | 0,000 |
| | Equal variance not assumed | 7,964 | 31,756 | 0,000 |

The calculated t value shows a value of 7.964 and the t table with 0.025 and $df=32$ is 2.3518, $t_{\text{calculated}} > t_{\text{table}}$ ($7.964 > 2.3518$) then H_0 is rejected, or there is a difference in the average of the control and experimental classes. So it can be said that there is a difference in improving the collaborative learning skills of students using group interactive learning media and students learning using LKPD (Learner Worksheet) media in grade 5 students at SDN Karangbesuki 4, Malang City.

Based on the results of the analysis of student responses to the use of group interactive learning media, the final percentage of student responses was 81.18%, which was classified as very positive. So it can be described that students are very happy and very interested in using this media,

and it can be concluded that the use of group interactive learning media is very positive for improving students' collaborative learning skills.

DISCUSSION

The research results showed that there were higher collaboration skills between students who used project-based learning and students who learned using LKPD (Learner Worksheets) on the theme "Use of Used Goods" for grade 5 students at SDN Karangbesuki 4, Malang City. It can be seen that the average learning achievement of the experimental group using project-based learning was 19.058, while the post-test average for the control group was 14.117. Based on the average learning outcomes, it can be concluded that students' collaborative learning skills are higher in students who apply project-based learning. (Ni Wayan Rati & I Gd Astawan, 2022)

The results of this research show that classes taught by implementing project-based learning have higher average scores, in line with several previous studies, namely: (Ismail, 2018) The research results show that the project-based learning model is effective in terms of self-confidence and problem solving skills but is not effective in terms of mathematics learning achievement; the problem-based learning model is effective in terms of self-confidence, mathematics learning achievement, and problem-solving skills; and problem-based learning is more effective than project-based learning in terms of mathematics learning achievement.

This means that the application of learning media using the group learning model has a significant effect on student learning outcomes. (Norhikmah et al., 2022) in this research, the results of this research show that learning innovation in Pematang Permai Kindergarten by implementing project-based learning with a simple imaginary destination approach can facilitate students' learning by utilizing tools and materials found around the students' living

environment. Learning invasion can be carried out from planning and implementation so that learning achievements can be measured properly. The importance of innovation in learning can encourage children's ability to explore ideas, interests, and creativity so that they can be useful for the future. Students are also equipped with problem-solving skills and skills to analyse weaknesses, strengths, and interests of students through projects given to children. (Haryono, 2023)

The application of project-based learning (Project-Based Learning or PBL) has been recognized as an effective method for developing collaboration, creativity, and problem-solving skills among students. However, the implementation of PBL at the elementary school level, especially in grade 5, often faces various obstacles, especially in the context of using used goods. (Ulhusna et al., 2020):

- 1) Lack of understanding between teachers and students. The first obstacle is the lack of understanding by teachers and students about PBL concepts and practices. Many teachers have not been adequately trained to implement PBL in everyday learning. As a result, they have difficulty designing interesting and relevant projects. Students may also not be used to this more independent and collaborative learning method, so they need time to adapt.
- 2) Limited Resources and Facilities. PBL requires sufficient resources, both in the form of teaching materials and facilities. For a project to utilize used goods, for example, various types of used goods are needed as well as tools to process them. However, in many primary schools, especially those in remote areas or with limited budgets, these resources are often unavailable or difficult to access.
- 3) Challenges in Time Management. Time management is an important obstacle in implementing PBL. Use of used goods projects requires quite a long time for planning, implementation and evaluation. On the other hand, the dense elementary school curriculum and limited class hours can make it difficult for

teachers to allocate sufficient time for each stage of the project. As a result, projects often do not run optimally and the results are less than satisfactory. 4) Difficulty in Student Collaboration. Collaboration is the essence of PBL, but teaching grade 5 students at SDN Sukun 3 Malang City to work together effectively is not an easy thing. Students at this age may not have mature enough social skills to collaborate without conflict. They need to learn to share responsibilities, listen to other people's opinions, and resolve differences constructively. This process requires intensive guidance and assistance from the teacher. 5) Lack of support from the school environment and parents. Support from the school environment and parents is very important for the success of PBL. However, in many cases, parents may lack understanding of the benefits of PBL and tend to consider it an unconventional method and less effective than traditional learning. Apart from that, a school environment that is less supportive, both in terms of policy and culture, can hinder the implementation of PBL. 6) Evaluation of Complex Learning Outcomes. Assessing learning outcomes in PBL is also a challenge in itself. Compared to conventional learning methods which usually rely on written tests, PBL requires a more holistic evaluation approach, which involves assessing students' processes, products and social skills. Teachers need to be competent in designing and implementing appropriate assessment instruments, which often requires additional training. (Sarifah & Nurita, 2023)

The results of the analysis of student responses to the use of group project-based learning showed that the final percentage of student responses was 81.18% which was classified as very positive. So it can be described that students are very happy and very interested in using this media, and it can be concluded that there is an influence of project-based learning on improving students' collaboration skills (Hutasuhut, 2024).

Situations like this can be used as capital to create an effective learning atmosphere in order to increase student learning achievement to a higher level. Students' very positive responses will be the first step towards an effective learning environment. So, obtaining a positive student response to improving students' collaboration skills in the classroom can indicate that the implementation of project-based learning can be well received by students. Therefore, the application of project-based learning can be used as an alternative step in classroom learning. (Muntari et al., 2018).

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the research and discussion, several conclusions can be put forward. The conclusions that will be put forward in this research are as follows.

1. There is an increase in collaboration skills between students who learn using project-based learning and students who learn using LKPD (Learner Worksheets) on the theme "Use of Used Goods" class 5 at SDN 4 Karangbesuki, Malang City. It can be seen that the post-test average for the experimental group using project-based learning was 19.058, while the post-test average for the control group was 14.117. Based on the average increase in students' collaborative learning skills, it can be concluded that the increase in students' collaborative learning skills is higher in children who use project-based learning.
2. The results of the analysis of student responses on collaborative learning skills showed that the final percentage of student responses was 81.18% which was classified as very positive.

Based on the research results, several suggestions can be put forward to improve the quality of learning on the theme of Yourself, namely (1) researchers suggest that schools use project-based learning as an alternative learning in the teaching and learning process in the

classroom considering learning with using project-based learning provides a positive influence on increasing students' collaborative learning skills. (2) this research was conducted with various limitations, especially class conditions, students, and the materials used. It is recommended that interested researchers carry out research using project-based learning for different themes and at different levels and can create a project-based learning guide as a medium for learning that will be addressed to teachers.

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