
The Influence of Problem-Based Learning Model on Student Learning Outcomes in the Theme of Technology Development Class III SD Negeri 101731 Kp. Lalang

Latifa Rahmi^{1*}, Ahmad Landong²

^{1*2} Universitas Muslim Nusantara Al-Washliyah, Medan, North Sumatra, Indonesia
latifarahmi589@gmail.com, ahmadlandong@umnaw.ac.id

DOI: <https://doi.org/10.21107/Widyagogik/v10i2.18181>

Received September 26, 2022; October 24, 2022; Accepted November 29, 2022

Abstract

This research aims to determine the learning outcomes on the theme of technological development for class III students who are taught using the Problem Based Learning learning model and to examine the effect of the Problem Based Learning Learning Model on student learning outcomes on the theme of technological development for class III students. The population of this study were all students of class III SD, totaling 58 people consisting of 2 classes III A and III B. This study used experimental research. The test results using the independent sample t-test formula, obtained $t_{count} = 2.43$ and $t_{table} = 2.04$. Thus $t_{count} > t_{table} = 2.43 > 2.04$, the average value of the experimental class and control class, where the experimental class is 68.33 and the control class is 59.56. It can be concluded that there is an influence of the problem-based learning (PBL) learning model on student learning outcomes in thematic subjects on the theme of technological development for class III students at SD Negeri 101731 Kp. Lalang.

Keywords – Problem-Based Learning Model; Learning outcomes; Technology Development



© 2023 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution ShareAlike (CC BY SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>).

1. Introduction

Education is an effort to improve the quality of life which in essence aims to create humans who can think more scientifically and make human behavior better. According to Nikunja (in Mustadi, et al, 2018: 10) states the following. Entomologically, the term "Education" comes from the Latin words - "Educare", "Educere" and "Educatum". "Educare" means to rise or bring forth or fertilize. In this case, education through its process draws out what is best in the child. "Educatum" denotes the act of teaching or training. That means educating children or providing training as a facility for children for their development. Therefore, the development of education is one of the top priorities in the national development agenda which is directed one way to improve the quality of education. In accordance with the goals of the Indonesian nation's national education as stated in the Preamble of the 1945 Constitution, it states that "To Educate the Life of the Nation". Education has a very important role in producing quality human resources (Mulyanto, Gunarhadi, & Indriayu, 2018); (Qomariyah, 2019). This goal can be achieved through education and teaching in various disciplines. To facilitate these needs, the education process needs attention, handling and priority from the government, society and education providers. Implementation of one of them is formal education, namely education in schools (Amini, Setiawan, Fitria, & Ningsih, 2019); (Timor, Ambiyar, Dakhi, Verawadina, & Zagoto, 2021).

According to Akhmadi (2020) says that teachers must have the ability to realize national education goals as stated in RI Law No. 20 of 2003 concerning the National Education System Chapter II article 3: "National Education functions to develop capabilities and shape national character and civilization that dignified in order to educate the life of the nation, aims to develop the potential of students to become human beings who believe in and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent and become citizens of a democratic and responsible country".

Thematic learning is integrated learning that uses themes to link several subjects so as to provide meaningful experiences to students. In this theme, there are several materials that are taught, one of which is the development of technology (Permatasari, 2019); (Kaharuddin, 2018) .

For thousands of years technology has been known to humans, it's just that the forms are not as sophisticated as what we find today. One example of the type or type of technology taught by students in the Class 3 Material book of Elementary School Theme 7 Curriculum 13 is the Development of Food Technology, Development of Clothing Production Technology, Development of Communication Technology, Development of Transportation Technology (Tambunan, Rusdi, & Miarsyah, 2018); (Imran, Ngampo, & Ardiansyah, 2022) .

One of the things that plays an important role in the success of education is the learning process. The learning activities in it can be supported by various learning elements, one of which is the learning model. The successful implementation of the learning strategy is highly dependent on how the teacher uses the learning model itself, because a learning strategy can only be implemented through the use of a learning model (Goni, Tumurang, & Ester, 2022); (Gao, Wang, Deng, Wan, & Mu, 2022) .

According to Parwati, et al (2018) states that "a learning model is a framework or design that describes the learning process that occurs in a class, to achieve certain learning objectives which has a function as a guide for educators in carrying out the teaching and learning process". Project Based Learning Model (Project Based Learning) is a learning model that uses problems as the first step in gathering and integrating new knowledge based on experience in real activities. Using the Project Based Learning method encourages the growth of creativity, independence, responsibility, self-confidence, and critical and analytical thinking in students. The application of this method, of course, adjusts to the learning material and the level of student development.

According to (Sukmwarti et al, 2022: 202) learning is needed in order to prepare students to face the industrial revolution era 4.0 which demands 21st

century skills, namely creative thinking, critical thinking, communication, and collaboration. (Rangkuti & Sukmawarti, 2022). A good learning process begins with wise planning. In learning, students not only interact with teachers, but students also interact with learning resources used to achieve the desired learning outcomes.

According to (Sukmawarti and Hidayat, 2020) the 2013 Curriculum Development is a follow-up step towards Competency-Based Curriculum Development which was pioneered in 2004 and the 2006 KTSP which emphasizes the attainment of attitude, knowledge and skills competencies in an integrated manner. According to (Hidayat and Khayroiyah: 2018) to reduce the emergence of learning barriers, teachers need to prepare appropriate learning tools. Learning innovations that require educators and students to think creatively and be able to adapt to the times to produce students who are active, creative, innovative and of course have noble character (Sukmawarti et al., 2021). According to (Hidayat, et al: 2021) in this modern era, technology is developing in various fields, such as education, including at the basic education level.

2. Method

The type of research used was quasi-experimental research (quasi-experimental). According to Rukminingsih, et al (2020) explained that "Quasi-experimental design is experimental research that was developed due to difficulties in getting a control group that can function fully in controlling external variables that can affect the experiment". This is because the student's conditions cannot be fully controlled, such as the student's relationship with parents, the student's relationship with the surrounding environment, homework assignments, and so on. This research was conducted in two classes, namely the experimental class and the control class.

The population in the study was students of SD Negeri 101731 Kp. Lalang so that the sample in this study were 58 students. This research was conducted on two groups, namely the experimental class and the control class. The

experimental class is a class that applies the Problem Based Learning model and the control class applies traditional learning. The two sample classes were given a pretest and then in the experimental class an action was taken, namely teaching Technology Development material with the Problem Based Learning learning model. This research will be carried out in 2022 with an estimated research schedule, namely in the 2022/2023 school year which will take place at SD Negeri 101731 Kp. Lalang. Jl. Binjai Km. 10 gg. Damai, Payageli Village, Sunggal District, Deli Serdang Regency.

Table 1. Research Design

Group	Pretest	Posttest	Treatment
Experiment	T1	X ₁	T2
Control	T1	X ₂	T2

The research instrument is a tool used to retrieve data/information that is taken very much depends on the correctness of the instrument used. The research instrument is software for the entire series of research data collection processes, according to Mukhid (2019).

The instrument used by researchers in collecting data was to use student learning outcomes tests as a research instrument which was carried out after the authors finished teaching the subject of technological development in the experimental class and control class. The type of test used is a formative test in the form of multiple choices which intends to find out how far students have formed or have mastered the subject matter after following a particular learning program. Before carrying out the learning activities the researcher first conducted a pretest to determine the initial abilities of students in both the experimental class and the control class.

3. Result and Discussion

This research uses the type of experimental research. Quasi-experimental design form. While the sampling technique uses saturated samples because all members of the population are used as samples so this research is population research. The sample in this study were 47 students, where the researcher took

two classes as research samples, namely class III A, totaling 24 students as the experimental class with the problem based learning (PBL) learning model and III B, totaling 23 students as the control class using the learning model. direct learning, the material taught in this study is the theme of technological development. For data collection, the researchers held 4 teaching meetings each for the experimental class and the control class, 1 meeting for the pretest (meaning to see students' initial knowledge) for both the experimental class and the control class and ended with 1 meeting for the posttest (experimental and control) which aims to see the learning outcomes after students are given different treatments.

Based on the results of the pretest conducted in the two sample groups, both the experimental class (III A) and the control class (III B) with multiple choice questions totaling 10 items, it can be seen that the pretest results showed that out of 24 students in the experimental class, only 25% could achieve KKM and 75% have not reached. Meanwhile, in the control class, the pretest results showed that out of 23 students, only 9% achieved the KKM and 91% did not. This shows that in both sample groups (both experimental and control classes) more do not understand the material on the theme of technological development. Thus, these results indicate that to determine students' prior knowledge of the material to be taught or (pretest) given to both classes is still relatively low.

And for the posttest results in both classes, namely in the experimental class, it was found that of the 24 students in the experimental class, only 58% were able to achieve the KKM and 42% had not. Meanwhile, in the control class, only 35% of the 23 students were able to achieve the KKM and 65% had not. Based on the results of the pretest and posttest, it can be seen that changes in student learning outcomes can increase. This shows that there is a significant change in the results of student learning tests before learning is carried out and after learning is carried out.

And you can see the difference obtained with the final results of the two classes that the experimental class is superior to the control class, that's because

the experimental class was treated using the problem based learning (PBL) learning model while the control class was only given direct (conventional) learning. So that using the problem based learning (PBL) learning model can improve learning outcomes because students are presented with practical problems as a reference for student learning, so students carry out the process of learning activities from concrete problems. As stated by Ibrahim and Nur in Rusman that "problem-based learning is a learning approach that is used to stimulate students' high-level thinking in situations oriented to real world problems, including learning how to learn". With the PBL model students become more active to think critically and gain knowledge and lead to good learning outcomes.

The hypothesis put forward in this study is that H_a will be tested for truth. The H_a hypothesis is "There is an influence of the Problem Based Learning (PBL) learning model on student learning outcomes in thematic subjects on the theme of technological development for class III SD Negeri 101731 Kp. Lalang".

The next test that was carried out was the prerequisite test, namely testing whether the test was normally distributed or not, in this case the researcher used the Microsoft Excel application program where the results obtained using the program were that student learning outcomes were normally distributed where the experimental class learning results showed $X^2_{count} = 4.958 < X^2_{table} = 11.070$ and the learning outcomes of the control class show $X^2_{count} = 6.292 < X^2_{table} = 9.488$ so it can be concluded that the learning achievement data of the two sample groups are normally distributed. Once it is known that in this study the data are normally distributed, the next step is to carry out a homogeneity test where to find out whether the two variables are related or not and the results of the study show that the two variables are related where $F_{count} = 1.15 < F_{table} = 2.00$ so that data from both groups is obtained homogeneous sample. And after the homogeneity of the two sample groups is known, the next step is to test the hypothesis, namely testing using the pooled variance formula because $n_1 \neq n_2$ and the data is homogeneous, while the results of calculations using the pooled variance formula are done manually. Next, give a conclusion/determine whether the proposed hypothesis is accepted or rejected or whether H_a is accepted or rejected.

As according to Sugiyono, hypothesis testing is carried out using the t-test with the testing criteria being if $t_{count} > t_{table}$, then H_a is accepted and H_o is automatically rejected and if $t_{count} < t_{table}$ then H_a is rejected and H_o is automatically accepted.

Based on the results of testing the hypothesis in this study, the result is that $t_{count} > t_{table}$ ($2.43 > 2.04$) with a significant level of 5% which means that the hypothesis (H_a) is accepted and the hypothesis (H_o) is automatically rejected. Obtaining the average value of the two classes, namely the experimental class was 68.33 and the control class was 59.57, higher learning outcomes in the experimental class than the control class.

The success of using the problem based learning (PBL) model is supported by several advantages including students are encouraged to have the ability to solve problems in real situations, students have the ability to build their own knowledge through learning activities, learning focuses on problems so that material that has nothing to do with students need to learn, scientific activity occurs in students through group work, students have the ability to assess their own learning progress, students have the ability to carry out scientific communication in discussion activities or presentations of their work, and individual student learning difficulties can be overcome through group work.

So by using this problem based learning (PBL) learning model, it is hoped that students can improve teaching and learning activities and be able to increase their understanding of the lessons given by the teacher, especially in mathematics. As for the research results of Pratiwi Noer Chabiba, et al with the title "the effect of the PBL (problem based learning) model on learning outcomes on broad subject matter in elementary schools", the results of this study stated that the problem based learning model had an influence on increasing student learning outcomes in subjects mathematics in broad subject matter with an average cognitive learning outcome among students who use the problem-based learning model is significantly higher than students who use conventional learning models with the acquisition of an average experimental class score of 83.55 and a class average score control of 57.42. So that there is a significant difference between student learning outcomes using the PBL model and student learning outcomes using the direct (conventional) learning model. For students who are taught using conventional learning models, in the learning process the teacher is more dominant in giving lectures, which are interspersed with questions and answers and providing evaluations. In conventional learning, students are not given the

opportunity to develop their knowledge, pose problems or solve work problems, discussions are also lacking so that communication between students is not good. So that the weakness of conventional learning is that students will find it difficult to develop students' abilities in socializing and critical thinking skills.

From some of the data analysis carried out in this study, it can be concluded that there is an influence of the Problem Based Learning (PBL) learning model on student learning outcomes in thematic subjects on the theme of technological development for class III SD Negeri 101731 Kp. Lalang

4. Conclusion

Based on the results of the research and discussion that has been carried out, it can be concluded that the problem based learning (PBL) model has an effect on student learning outcomes in thematic subjects on the theme of technological development in class III SD Negeri 101731 Kp. Lalang for the 2021/2022 school year. This is evidenced by the results of hypothesis testing using the independent sample t-test formula, obtained $t_{count} = 2.43$ and $t_{table} = 2.04$. Thus $t_{count} > t_{table} = 2.43 > 2.04$, meaning that there is an influence of the problem-based learning (PBL) learning model on student learning outcomes in thematic subjects on the theme of technological development for class III SD NEGERI 101731 KP. LALANG Likewise can be seen in the acquisition of the average value of the experimental class and control class, where the experimental class is 68.33 and the control class is 59.56, so that it can be seen the effect on the experimental class which is treated in the form of a problem based learning (PBL) learning model with control class that was not given treatment.

References

- Ahmadi, R. 2014. *Pengantar pendidikan : asas dan filsafat pendidikan*. (Yogyakarta : Ar-Ruzz Media)
- Amini, R., Setiawan, B., Fitria, Y., & Ningsih, Y. (2019, November). The difference of students learning outcomes using the project-based learning and problem-based learning model in terms of self-efficacy. In *Journal of Physics:*

Conference Series (Vol. 1387, No. 1, p. 012082). IOP Publishing.

Gao, X., Wang, L., Deng, J., Wan, C., & Mu, D. (2022). The effect of the problem based learning teaching model combined with mind mapping on nursing teaching: A meta-analysis. *Nurse Education Today*, *111*, 105306.

Goni, A. M., Tumurang, H., & Ester, K. (2022). Problem Based Learning (Pbl) Model and Mathematics Learning Outcomes Students. *Specialusis Ugdymas*, *1*(43), 8277-8284.

Hidayat, & Khayroiyah, S.. 2018. Pengembangan Desain Didaktis Pada Pembelajaran Geometri. *Jurnal MathEducation Nusantara*, *1* (1), 2018, 15-19. <https://jurnalpascaumnaw.ac.id/index.php/JMN/article/view/2/2>

Hidayat, Sukmawarti, Suwanto. 2021. Penerapan augmented reality dalam pendidikan sekolah dasar. *Research, Society and Development*, *10*(3), e14910312823, 1-2. <https://doi.org/10.33448/rsd-v10i3.12823>

Imran, A. F., Ngampo, M. Y. A., & Ardiansyah, A. (2022). Implementation of the Problem-Based Learning Model and Its Effect on Accounting Learning Outcomes During the COVID-19 Pandemic. *Journal of Educational Sciences*, *6*(2), 275-285.

Kaharuddin, A. (2018). Effect of problem based learning model on mathematical learning outcomes of 6th grade students of elementary school accredited B in Kendari city. *International Journal of Trends in Mathematics Education Research*, *1*(2).

Mukhid, A. 2021. *Metodologi Penelitian Pendekatan Kuantitatif*. Surabaya: CV Jakad Media Publishing.

Mulyanto, H., Gunarhadi, G., & Indriayu, M. (2018). The effect of problem based learning model on student mathematics learning outcomes viewed from critical thinking skills. *International Journal of Educational Research Review*, *3*(2), 37-45.

Permatasari, B. D. (2019). The Influence of Problem Based Learning towards Social Science Learning Outcomes Viewed from Learning Interest. *International Journal of Evaluation and Research in Education*, *8*(1), 39-46.

Purwati, N. N., Suryawan, I. P., & Apsari, R.A. 2018. *Belajar dan Pembelajaran*. Depok: PT Raja Grafindo Persada.

Qomariyah, S. N. (2019). Effect of problem based learning learning model to improve student learning outcomes. *International Journal of Educational Research Review*, *4*(2), 217-222.

- Rukminingsih, Adnan, G. & Latief. M.A. 2020. Metode Penelitian Pendidikan. *Penelitian Kuantitatif, Penelitian Kualitatif, Penelitian Tindakan Kelas*. Vol. 53.
- Sukmawarti & Rangkuti, C. J. S., 2022. Problematika Pemberian tugas Matematika Dalam Pembelajaran Daring. *IRJE Jurnal Ilmu Pendidikan*, 2(2), 565-572. *IRJE: JURNAL ILMU PENDIDIKAN*, 2(2), 565–572. <https://journal.universitaspahlawan.ac.id/index.php/irje/article/view/3848/265>
- Sukmawarti, Hidayat, Putri, L.A. 2022. Workshop Worksheet Berbasis Budaya bagi Guru MI Jami'atul Qamar Tanjung Morawa. *PaKMas: Jurnal Pengabdian Kepada Masyarakat*, 2(1), Hal:202-207. <https://doi.org/10.54259/pakmas.v2i1.848>
- Sukmawarti, Hidayat. 2020. Cultural-Based Alternative Assessment Development in Elementary School Mathematics. *Advances in Social Science, Education and Humanities Research*, 536, 78-92. <https://doi.org/10.26740/jrpijm.v6n1.p78-92>
- Tambunan, L., Rusdi, R., & Miarsyah, M. (2018). Effectiveness of problem based learning models by using e-learning and learning motivation toward students learning outcomes on subject circulation systems. *Indonesian Journal of Science and Education*, 2(1), 35-43.
- Timor, A. R., AMBIYAR, A., DAKHI, O., VERAWADINA, U., & ZAGOTO, M. M. (2021). Effectiveness of problem-based model learning on learning outcomes and student learning motivation in basic electronic subjects. *International journal of multi science*, 1(10), 1-8.