



Comparison Of Pbl (Project Based Learning) Models With Pbl (Problem Based Learning) Models To Determine Student Learning Outcomes And Motivation

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ABSTRAK

Permasalahan yang mendasari penelitian ini adalah rendahnya hasil belajar dan kurangnya motivasi siswa untuk belajar, sehingga diperlukan model pembelajaran yang dapat meningkatkan kualitas proses dan hasil belajar. Tujuan penelitian ini adalah untuk menganalisis perbandingan antara model PJBL model PBL terhadap motivasi dan hasil belajar siswa. Jenis penelitian ini adalah studi pustaka, dengan subjek penelitian yaitu perbandingan model pembelajaran PBL dengan PJBL. Metode pengumpulan data yang digunakan adalah teknik kepustakaan deskriptif. Data yang diperoleh dianalisis dengan menggunakan reduksi data, penyajian data, dan penarikan kesimpulan data. Hasil dari penelitian ini menunjukkan bahwa model PJBL lebih unggul dalam meningkatkan motivasi dan hasil belajar siswa. Simpulan dari penelitian ini adalah model pembelajaran PJBL lebih unggul di bandingkan PBL untuk mengetahui hasil belajar dan motivasi siswa. Implikasi penelitian ini selain mendapatkan hasil analisis model PJBL dan PBL dapat memberikan gambaran mengenai model pembelajaran yang cocok digunakan didalam proses pembelajaran.

ABSTRACT

The problems that underlie this research are low learning outcomes and a lack of student motivation to learn, so a learning model is needed to improve the quality of the process and learning outcomes. This study aimed to analyze the comparison between the PJBL model of the PBL model on student motivation and learning outcomes. This research is a literature study with the research subject, comparing the PBL learning model with PJBL. The data collection method used is descriptive literature to find PJBL and PBL through reliable research data from other people. The data obtained were analyzed using data reduction, data presentation, and data conclusion. This study indicates that the PJBL model is superior in increasing student motivation and learning outcomes to the PBL model because PJBL can directly encourage students' motivation, which will automatically improve student learning outcomes. This study concludes that PJBL is superior to PBL in determining student learning outcomes and motivation. This research implies that apart from getting the PBL and PJBL models' results, it can provide an overview of the appropriate learning models for use in the learning process.

1. Introduction

The 21st century is a development of knowledge marked by advances in science, technology, the industrial revolution, globalization, and the environment (Fitri et al., 2020; Jayadi et al., 2020). This century demands a very big change in the national education system. We know that our education is a legacy from the old education system whose contents can be learned and have meaning (Efriyanti & Annas, 2020; Lubis, 2018). The 21st century offers a new paradigm of education, which will also be a new challenge for professional teachers to continue to innovate to achieve a quality teaching and learning process system.

The teacher plays a dominant role in determining students' success, especially in the teaching and learning process. Teachers must master competencies and have good abilities to plan and implement the learning process so that the teaching and learning process can be directed to the desired goal. The interaction between students and teachers is a determinant of student success in learning. According to (Komalasari, 2019; Ningsih et al., 2019), teachers who have high professionalism will always have good interactions with their students and always motivate them to learn to achieve success in learning.

The learning model is an important element in teaching and learning proses, with a structured conceptual scenario. The flow in the learning process can be in line with the objectives to be achieved. The use of an inaccurate learning model can lead to student boredom in participating in the learning process. The material is poorly understood and makes learning monotonous so that students are less motivated to learn (Istijabatun, 2019; Yuliarni et al., 2013). The learning model contains the teacher's choice of strategies for specific classroom goals with a framework. It is conceptually and systematically structured in its procedures and organization, based on learning experiences to achieve the expected goals.

The learning process determines the success of learning activities carried out by students and is the main activity determining the success or failure of educational achievement goals (Hartini et al., 2016; Pantiwati, 2012). Appropriate learning strategies need to be applied in the classroom environment to encourage student motivation to obtain good learning outcomes. Many subjects taught by teachers use conventional models to be less effective in achieving learning outcomes according to the school's standards. The learning process's right learning model makes it easy for teachers to carry out their duties as educators. Students will more easily understand the teacher's lessons. They can develop the abilities they have in the learning process properly and manage the learning process well from a teacher to produce a quality learning process.

Many learning models have been developed, from simple to complex and complex models because they require many application tools. There are various learning models, including PjBL (Project Based Learning) and PBL (Problem Based Learning) models. Problem Based Learning (PBL) and Project-Based Learning (PjBL) are two learning models with different approaches. Many people mistakenly think they are the same. The difference is that students' problems drive the PBL approach. In contrast, the PjBL approach is driven by the project's final product to be achieved in the learning process. The main focus is on the entire ongoing project process (Farihatun & Rusdarti, 2019; Rifai et al., 2019).

PBL is one of the higher-order thinking skills used to improve the process's quality and learning outcomes is the PBL model (Fitri et al., 2020; Maryatun & Metro, 2017). Meanwhile, the PjBL model, which is a learning model that uses projects or activities as a learning tool. This model also has enormous potential to make learning experiences more interesting and meaningful to improve student learning outcomes and positively affect student learning motivation (Astuti et al., 2019; Kristiyanto, 2020). The implementation of PjBL (Project Based Learning) and PBL (Problem Based Learning) should be carried out properly following the learning syntax. The two learning models' applications can be fully optimized, and the results obtained can also be effective and efficient.

Several studies relevant to this research include (1) research conducted by (Kurniawan et al., 2018) obtained the results that there were differences in learning independence between students taught with the PjBL learning model assisted with the teaching module and TPS with the teaching module. (2) research conducted by (Ariyanti, 2017) obtained the results that the Project-Based Learning and Problem Based Learning models are effective in learning mathematics but not effective in learning achievement and students' mathematical problem-solving abilities. (3) research conducted by (Sihombing, 2018) obtained the results that applying the Cooperative Learning method of class traveling techniques can increase students' motivation to learn Civics.

No research analyzes the PjBL and PBL learning models on learning motivation and outcomes based on these studies. The purpose of this study was to analyze the comparison between the PjBL (Project Based Learning) model and the PBL (Problem Based Learning) model on student motivation and learning outcomes.

2. Method

This type of research is a literature study. Literature study occupies a very important position in research. Although some people distinguish between library research and field research, both require a study of literature. Library research is an activity carried out systematically to process, collect, and conclude data using certain methods/techniques to find answers to problems that will be part of the research (Alnashr, 2018; Kristiantari, 2015).

The source of data for this research is in the form of trusted journal articles (accredited) obtained through the internet related to the topic of the PjBL learning model (Project Besed Learning) and the PBL (Problem Based Learning) model to determine learning outcomes and student learning motivation.

Data collection in this research is done by reviewing and exploring several journals relevant to the research or study. This study's stages began by recording all the findings in journal articles regarding comparing the PjBL (Project Based Learning) learning model and the PBL (Problem Based Learning) model related to student learning outcomes and motivation. Furthermore, the second stage, examining the theories related to journals regarding the PjBL (Project Based Learning) learning model and the PBL

(Problem Based Learning) model. The third step is to analyze various interrelated reading results, from each source's shortcomings to the phenomena's strengths. The last stage is to provide critical ideas in the research results on previous discourses by presenting new findings in collaborating different thoughts to maintain the rigor of the assessment process and prevent and overcome information missions due to a lack of literature writers, inter-literature checks are conducted and attention to supervisor comments.

The data analysis technique used in library research is using content analysis. This analysis method is used to obtain results regarding the analysis of the PjBL (Project Based Learning) model of PBL (Problem Based Learning) model on student motivation and learning outcomes.

3. Result and Discussion

Education is essentially a conscious human effort that aims to improve and develop human quality. In the process, education cannot be separated from the role of the teacher or educator. Teachers have a dominant role in education, especially related to the teaching and learning process. By choosing the right technique or learning model, mistakes in choosing a technique or learning model will impact students. It is reflected in learning activities dominated by teachers in managing information in the classroom and teachers using less attractive learning models or conventional methods. Students are not interested and are not motivated to participate in learning. The teacher's role as a facilitator in teaching and learning activities is needed to increase the motivation to learn to think of students as a whole (Hartoyo et al., 2016; Saragih & Simarmata, 2018). The learning model has an important role in teaching and learning activities. Students' ability to receive lessons can be influenced by selecting an appropriate learning model by the teacher to achieve the learning objectives.

The use of the teacher's right learning model can generate, direct, and channel all the existing power in students to have the motivation to learn to think to achieve goals in learning. Lack of motivation to learn by students because most teachers apply conventional learning models so that students feel that learning makes students bored and impacts learning outcomes to be achieved. The learning model is very important in a learning process because it can create learning that follows educational learning characteristics. Teachers as educators must be selective in choosing learning models. Each learning model applied will have a different impact on student competence (Han & Rosli, 2016; Herzon et al., 2018). Therefore, it is necessary to look for innovative learning models that can increase self-motivation during the learning process to improve learning outcomes.

According to learning, not only influenced by the learning model, students' psychological level also takes over its influence on learning. One of them is the level of motivation of students. The motivation of students is very influential on the level of cognitive abilities of students. If motivation is high, maximum learning outcomes will be obtained, and vice versa, low motivation will get minimal learning outcomes. Low motivation can be observed from the teacher's assignments, not done by students. The collection of assignments is not always according to a predetermined time. Motivation can also be increased by using attractive models and media to increase students' motivation to learn. Increased motivation will impact learning outcomes (Budiarta et al., 2016; Murdika, 2018).

Moreover, low motivation will affect the low level of learning. Several factors affect student learning motivation, including internal factors that come from within the student, such as the student's physical and spiritual condition. External factors come from outside the student and the student (Sihombing, 2018; Suprihatin, 2015). Internal and external factors mentioned above in many ways are often related and influence each other.

Individuals who can excel will do better, more efficient, faster, and more enthusiastic and responsible activities to get good learning achievement. The training factor is very important for students to do. However, without motivation, it will impact constrained results, and the process takes time. Learning outcomes include cognitive, affective, and psychomorphic, besides the low learning outcomes of students' cognitive aspects in learning patterns. Students have not been maximally involved actively in the learning process (Fitry et al., 2019; Sribawana et al., 2017). Learning outcomes mean the results a person gets from the activities carried out and resulting in behavior changes. To obtain learning outcomes, one must study first. Learning is the mastery of habits, perceptions, pleasures, interests, talents, social adaptations, types of skills, aspirations, desires, and hopes, not just mastery of subject theory concepts. (Hadiyati & Wijayanti, 2017; Indayatmi, 2017).

Learning outcomes are an evaluation action that can reveal aspects of the thinking process (cognitive domain) and can reveal other psychological aspects, aspects of values or attitudes (affective domain) and aspects of skills (psychomotor domain) inherent in each student (Novitasari, 2018; Sofianti et al., 2013). It means that through learning outcomes, a holistic description of student achievement can be revealed after learning. Learning outcomes can be interpreted as objects of class assessment in the

form of new abilities obtained by students after they take part in the teaching and learning process that will not be lost forever because learning outcomes participate in shaping individual personalities who always want to achieve better results, so that they will change the way of thinking and produce better work behavior (Dewi et al., 2013; Sari et al., 2018). Therefore what the teacher can do in this case is only to take a snapshot of changes in behavior that are considered important and are expected to reflect changes that occur as a result of student learning, both in the dimensions of creativity and taste and intention.

The influence of PjBL (Project Based Learning) learning model is on student learning outcomes and motivation. Education is fundamental in shaping each individual's character. Education is expected to optimize students into human beings who have full competence. Through a good learning process will create quality humans. The learning process begins with the teacher and student interaction. The learning process will achieve its goals if the teacher uses the right learning model to play a role during the ongoing learning process actively. The lack of teacher knowledge regarding selecting the right learning model will directly affect student learning outcomes. One learning model that can be categorized as a good learning model based on several studies is the PjBL model. Research being carried out (Sekarwangi & Wardani, 2018) explained that the tendency of thematic learning outcomes when using the PjBL model in class V students at SDN Rejowinangun, obtained a mean score of 18.6667 so that in the normal curve it is in the high category, the PjBL model can help the process and maximum learning outcomes because through PjBL students can exchange thoughts to provide solutions / problem-solving in everyday life with project activities carried out in the learning process. In line with the research conducted (Nugroho et al., 2018), which obtained the posttest mean score of student learning outcomes given the PjBL model treatment of 85.66 is greater than the class treated with the conventional model of 79.05, it can be seen that the difference in the class average of the two models is 6.51. The score obtained in the t-test to determine the significance of the effect of the application of the PBL model and the conventional model is known from the Sig (2 tailed) score of 0.00 which indicates that $0.00 < 0.05$, which indicates that H_0 is rejected and H_a is accepted. This means that in the research carried out there were quite high differences in learning outcomes of students who were given PjBL treatment compared to students who were treated with conventional learning models.

PjBL is assessed as a learning model that directs students to solve real-world problems through the process of investigation, besides that the project-based learning model is a learning model with constructivist principles where students use competency knowledge and skills in finding solutions to solve problems that occur (Farihatun & Rusdarti, 2019; Rifai et al., 2019). Research by (Pramukantoro, 2013) also explained the role of the PPA model on student learning outcomes in the Electronic Engineering Journal of the National University of Surabaya, it was found that the posttest data calculation showed the average learning score of the experimental class (PjBL) was 74.88 while the control class average learning score (conventional) was 57.14. The average score of the experimental class learning is higher than the control class. The independent t test analysis, with t count of 0.975 and dk = 34, was obtained t count 19.3. Meanwhile, through t table 2.04 because t count > t table. So that H_0 is rejected, and H_1 is accepted. So it can be concluded that there is an influence of the PjBL model on student learning outcomes.

The PjBL stages presented by (Afifah et al., 2019; Trimawati et al., 2020) : (a) The determination of the fundamental question or better known as the driving question. This question determines students' direction and goals to produce work or learning outcomes as learning products; (b) Preparing project planning or drawing up plans. A plan is designed to facilitate resolution or problem-solving; (c) Set the schedule, the schedule is prepared with the consideration that everything to be done must be determined when implemented so that everything is on target; (d) Monitor is carried out during the process of working on the project; (e) Test results after the product or work has been completed by students; (f) Field evaluation is carried out in the field or applied elsewhere with the same problem focus so that the feasibility, injustice or product revision has been obtained. It is strengthened by research conducted by (Kholida & Suprianto, 2019). Based on the results of student learning motivation data obtained by providing a motivation questionnaire, it shows that the significance score of α is greater ($0.021 < 0.05$), so that H_0 is rejected and H_1 is accepted, which means that there is an effect of the PjBL learning model on student learning motivation. It is because several stages in the PjBL model can generate student learning motivation. The analysis of learning outcomes showed that the significance score in this study was $0.002 < \alpha$, which means that H_0 is rejected, H_1 is accepted. Thus, there is an effect of students' initial abilities on learning outcomes. This happens because students who have sufficient prerequisite knowledge to learn the material, because they tend to quickly solve the problems given by the teacher. Through this research, it is concluded that when students' learning motivation increases, the learning outcomes obtained by students will also increase.

The influence of PBL (Problem Based Learning) learning model on student learning outcomes and motivation, students do not only determine good learning with the highest evaluation results. But a teacher plays an important role in determining student success. In this case, the teacher's classroom activities are all teacher activities in the learning process (Ratnawati et al., 2020; Wajdi, 2017). Activities in learning are very much determined by the learning strategies used by the teacher. One form of strategy is to apply innovative learning models. The ability of teachers to determine effective and efficient learning models is needed in determining student learning success. In addition to PPA, the learning model that many teachers recommend is the Problem Based Learning (PBL) Model. PBL is student-centered in the process of ongoing teaching and learning activities (Herzon et al., 2018; Maryatun & Metro, 2017). This model can reduce the dominance of teachers in teaching in the classroom. The PBL learning model can familiarize students with solving problems given to the teacher and increase students' understanding of what is being learned.

IN=n the PBL method, the teacher guides students to solve problems related to the material. The specified problems are still related or often encountered in daily activities. With the problem determined by the teacher, students look for solutions in groups. The search for solutions can be made from various studies (internet, books, fields, etc.). At the end of the lesson, students presented the results of their respective group discussions. Presentation activities allow the exchange of ideas between students. Learning activities using the PBL method can increase student participation so that it is expected to increase student motivation as an alternative solution to problems faced in class (Fitri et al., 2020; Rerung et al., 2017). The research results (Novianti et al., 2020) based on the calculation of the t-test, a significant score of 0.00 smaller than the real level of 0.05. There is a significant influence between the PBL learning model on student learning outcomes in learning. It can be concluded that there is an effect of the PBL learning model on student learning outcomes in Thematic learning Integrated into fifth-grade Elementary School. It can be seen that the average learning outcomes of students in the experimental class (PBL) are higher than the control class. Students in the class who use the PBL model each student share knowledge in responding and solving problems. In this model, students are trained to be ready and share knowledge with group members.

PBL can make students work on an authentic problem to build students' knowledge in the teaching and learning process individually or in groups. PBL students can remember and transfer information more effectively if they build themselves up rather than just reading and listening. According to (Han & Rosli, 2016; Wajdi, 2017), In the PBL learning model, the teacher can provide various problems, questions and facilitate investigations and dialogue between students and students and teachers. The teacher provides ample opportunities for students to develop themselves freely. The teacher has limited the way to determine what problem topics the students should discuss.

The application of PBL not only has an impact on student learning outcomes but also affects student learning motivation in class. If learning motivation increases automatically, learning outcomes will also increase. Several studies related to the application of PBL in increasing student motivation have also been carried out. Research by (Arofiq, 2019) shows an increase in motivation and student learning outcomes through the application of PBL. The student's motivation to learn from 75%, categorized as good in the first cycle, increased to 87.5%, which was categorized as very good in the second cycle. While the students' pre-action learning outcomes showed an average of 78.20, which increased to 81.05 in the first cycle and increased to 88.50 in the second cycle. (Samsulimi et al., 2019) shows that there is an increase in student motivation through the application of the PBL learning model with the results of $t\text{-hit} = 14.61 > t\text{-table} = 1.99$ which can be concluded that the use of PBL learning models can increase student motivation in the material of the human digestive system in class eleven MAN Blangpidie.

The PBL Model's influence on student learning motivation is also proven by research (Istanti, 2015). The results showed that the experimental group mean of 81.82 was in the very high learning motivation category. The mean of the control group was 71.42 in the category of high learning motivation. Apart from that, research (Ramlawati et al., 2017) obtained an average score of motivation after learning of 105.6 (high category) and an average score of learning outcomes of 87.17 (very high category). The inferential analysis results using the t-test of learning motivation obtained a score of 1.89 and t-test results of learning outcomes $t_{count} > t_{table}$ (t table 1.67). It means that H_0 is rejected and H_1 is accepted. The results of descriptive analysis of students who were taught with the PBL model showed that the average score achieved was 87.17, and the control class taught using conventional learning models shows an average score of 77.73. In this case, the PBL (Problem Based Learning) learning model affects student motivation and learning outcomes.

The stages of the PBL learning model proposed by (Farah et al., 2020; Mislal & Mawardi, 2020) as follows: (1) student orientation to the problem; (2) organizing students to learn; (3) guiding individual/group experiences; (4) develop and present the work; and (5) analyzing and evaluating the

problem-solving process. While the characteristics of the PBL model presented by (Istiandaru et al., 2015; Rerung et al., 2017) : (a) Learning begins with problems, (b) Ensuring that the problems given are related to the realities of the student's world, (c) the implementation of learning that covers problems, not around scientific disciplines, (d) gives great responsibility to students in building and running the learning process directly, (e) using small groups, and (f) requiring students to demonstrate what they have learned in the form of products or appearances.

How big are the difference in student learning outcomes and learning motivation between the PjBL (Project Based Learning) learning model and the PBL (Problem Based Learning) model? Based on the explanation above regarding the PjBL Model and the PBL model, the two learning models are highly recommended learning models to be applied in classroom learning activities because they are considered capable of increasing student learning motivation and student learning outcomes. The project-based learning (PjBL) model is a learning model that uses problems as a first step in collecting and integrating new knowledge based on experiences in real-world activities (Kristiyanto, 2020; Trimawati et al., 2020). This model is designed to solve complex problems that students need to carry out investigations and understand. Meanwhile, the PBL model is a model that carries a certain theme in determining the problem. Students must know the basic theory well and try to provide alternative solutions to solving problems that the teacher has determined. However, it is different when talking about comparing the two learning models. In terms of comparing, there will always be those categorized as good and bad. Several studies have been conducted on how much difference in student learning outcomes and motivation between PPA learning models and PBL models. Research conducted (Nugroho et al., 2018) Regarding the comparison of the PPA and PBL learning models, the posttest average results have given the PBL model treatment were greater than 85.66 compared to the PjBL model of 82.22. Then it can be seen that the difference in the class average of the two models is 3.44. This score is obtained in the t-test to determine the significance of the effect of implementing PBL and PPA. It is known from the Sig (2-tailed) score that the data score is 0.022 which indicates that $0.022 < 0.05$, which indicates that H_0 is rejected and H_a is accepted. This means that in this study there were differences in students who were treated with the PBL learning model compared to students who were treated with the PjBL learning model for their learning outcomes. This difference is caused by several factors where PBL can encourage students to be creative in solving problems starting from understanding the problem itself compared to the PjBL model which focuses on determining project solutions without understanding the problem. However, there are many studies related to the comparison of the PjBL model and the PBL model which prove that the PjBL model is superior to the PBL model.

Research conducted by (Murniyati, 2018) Regarding the PPA model with the PBL model, applying the PjBL model is superior to the PBL model with an average learning outcome increasing from 72.08 to 84.09. Pjbl can increase student motivation so that the teaching and learning process becomes more interesting and fun. It is in line with research (Desnylasari et al., 2016), which shows that the post-test mean score of the experimental class PjBL is higher than the PBL class, 2.90 for PjBL and 2.81 for PBL. Research conducted by (Mirzaqon & Purwoko, 2017) related to PjBL and PBL. It is obtained that the final assessment data of students learning outcomes are student learning outcomes after being combined with the scores of cognitive, affective, and psychomotor domains. The highest score in the experimental class final score (PjBL) is 100. The highest score in the control class (PBL) is 98, the lowest score in the experimental class is 84. The lowest score is 80, while the mean score in the experimental class is 92.8 and the control class is 89.7.

The results showed that using the PPA model had a good influence on the learning process and student learning outcomes, which made the learning conditions conducive. The PPA learning model's application in this study has more influence on student learning outcomes than the PBL model. The PPA model can make the classroom atmosphere more conducive. Students are more active and enthusiastic in participating in the ongoing learning process compared to the application of the PBL model. Research being carried out (Suyastini, 2017) also stated the superiority of the PjBL learning model compared to PBL, based on the final post-test average score of PjBL, which is 81.87 while the final post-test score of the PBL model is 81.10, this shows that the PjBL model is superior to the PBL learning model for improving student learning outcomes. Besides the research results (Chiang & Lee, 2016), PPA has a positive effect on student motivation than PBL. PjBL is superior to PjBL because it can encourage students' spirit of motivation and provide a means to demonstrate and explain what students make through projects carried out in the learning process. Students feel more ownership of projects carried out in the PPA model because they are directly involved in the learning project (Dole et al., 2017).

PjBL and PBL are learning models that are highly recommended to be applied. They can improve student learning outcomes because student involvement is more dominant in the process. (Dole et al., 2017; Murniyati, 2018). Both learning models are equally good when applied to improve student learning

outcomes. Project-based learning and problem-based learning models are both needed in problem-solving effectiveness to achieve the desired learning goals. The ineffectiveness of a learning model can be said that the learning objectives have not been achieved. However, based on this literature study, most references from several journals related to comparing PjBL and PBL learning models to tie learning motivation and student learning outcomes state that the PjBL model is superior to PBL.

Several studies relevant to this research include (1) research conducted by (Kurniawan et al., 2018), who obtained the results that there were differences in learning independence between students taught with the PjBL learning model assisted with the teaching module and TPS with the teaching module. (2) research conducted by (Ariyanti, 2017) obtained the results that the Project-Based Learning and Problem Based Learning models effectively teach mathematics but not effective in learning achievement and students' mathematical problem-solving abilities. (3) research conducted by (Sihombing, 2018) obtained the results that applying the Cooperative Learning method of class traveling techniques can increase students' motivation to learn Civics.

Based on this study's results, this study's implications are to obtain the analysis of the project-based learning model and problem-based learning, which can provide an overview of the learning model suitable for use in the learning process.

4. Conclusion

Based on the description above, the PjBL learning model is superior to PBL in determining student learning outcomes and motivation. This research implies that besides getting the project-based learning and problem-based learning models, it can provide an overview of the learning models suitable for the learning process.

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