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The Effectiveness of Problem Based Learning in Terms of Creativity and Learning Outcomes

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Abstract

This study aims to describe the effectiveness of Problem Based Learning in terms of student creativity and student learning outcomes. This research is located at Prigen Prosperous Middle School in the even / odd semester of the 2019/2020 school year. This type of research uses the type of descriptive research with descriptive qualitative research methods with research subjects VII grade students of Prosperous Prosperous Middle School. The steps in this research are determining the problem, conducting a literature study, determining the location, determining the method, data collection, and data analysis. In this study, the average percentage of the learning achievement in the preliminary activities was 92.21%, the core activities were 96.41% and the closing activities were 81.47% so that overall the learning implementation was categorized as very good. The average percentage of students' creativity is 82.0% with a very good category. The average percentage of student learning outcomes students 81.81% with a very good category. Based on the description, Problem Based Learning is effective in terms of students' creativity and learning outcomes.

Keywords: Effectiveness, Problem Based Learning, Creativity, Learning Outcomes

INTRODUCTION

Mathematics is a subject that is considered difficult by students, this can lead to students' poor mathematical abilities (Astriani et al, 2017). The purpose of learning mathematics is to improve the ability of students to think in solving problems in a real-world context. According to Padmavathy & Mareesh (2013), efforts in creating effective learning can be done by improving the quality of teaching. According to Cahyaningsih & Ghufron (2016), one of the important skills students must possess in learning is the ability to solve problems. In everyday life, the branch of mathematics that we often encounter is getting up flat. However, the material is material that is not popular for students. Because students have difficulty in understanding the concept and its application (Widiyanti, 2013).

The aspect of creativity refers to the ability of individuals who favor the uniqueness and skills to produce new ideas so that they are of value to the individual (Susana and Supratik, 2010). This shows that students' creative thinking ability is very important to be the teacher's attention. According to Munandar & Utami (2009), several aspects can be considered in creativity which includes fluency, flexibility, originality, and detailing.

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Model Problem-Based Learning is a problem based learning as a basis to help students to show or clarify creative ways of thinking in solving problems (Surya et al, 2017). Model is Problem Based Learning suitable to be used in increasing student creativity because, in the learning process, students will be given problems related to daily life to stimulate students to think more creatively Rizkia (2017). With Problem Based Learning students can build new knowledge that is more meaningful because the problem raised is an event that exists in a real-world context (Amalia et al, 2017). Besides, during the process of learning Problem-Based Learning students are given space to play an active role, students are given freedom in creative thinking and active participation in developing reasoning in learning activities and problem-solving (Yustianingsih et al, 2017). The importance of problem-based learning that students can learn in problem-solving, and deepen mathematical concepts.

Research Results Padmavathy & Mareesh, (2013) show that the model Problem-Based Learning can relevantly improve student learning outcomes in mathematics, besides, it can provide a positive attitude on learning mathematics. The research equation above with this research is, using the model Problem-Based Learning. The difference in the above research is that Research (Padmavathy and Mareesh, 2013) measures improving student learning outcomes while researchers increase student creativity and learning outcomes.

The results of interviews with mathematics teachers at Prigen Prosperous Middle School, especially in class VII C. Information is obtained that students of class VII C have problems with flat material. Class VII C students have a low level of creativity. Besides, other problems were found, namely, students were not fluent in solving problems in time, in solving problems students could only work on problems in one way and students could only solve problems by looking at books or following the teacher's way. Model Problem Based Learning has never been applied in the class. There are factors in mathematics learning problems in the school, one of which is inaccuracy in choosing a learning model.

Based on the problems described above, the researcher wants to study a study entitled "Effectiveness of Problem Based Learning in terms of Creativity and Learning Outcomes" The purpose of this study is to describe the effectiveness of Problem Based Learning in terms of creativity in learning outcomes.

RESEARCH METHODS

This research was carried out at Prigen Prosperous Middle School, conducted in the even semester of the 2019/2020 school year. This type of research is descriptive with a qualitative approach. Qualitative research is research that aims to understand the phenomena that occur and are experienced by research subjects (Moleong, 2006). The purpose of this descriptive qualitative research here is to describe the effectiveness of *Problem Based Learning in* terms of creativity and learning outcomes

The subjects of this study were Grade VII students of Prigen Prosperous Middle School, totaling 33 students. The object of this research is the implementation of PBL learning, creativity, and student learning outcomes after using the model *Problem-Based Learning*. The steps in this research are determining the problem, conducting a literature

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study, determining the location, determining the method of data collection, and data analysis. The data collection techniques implemented in this study include (1) Observation techniques to collect data by seeing and observing directly the implementation of PBL learning models, (2) The test is used to obtain data on creativity and student learning outcomes. The observation data analysis technique was analyzed with the following steps: Giving a score in each answer according to the criteria that had been made; 2) Determine the average score obtained for each creativity assessment format in one class; 3) Change the score in the form of a percentage value; 4) Determine the category of the results of the student creativity assessment format in one class. While the data techniques of the test are analyzed with the following steps: 1) Giving a score on each answer under the criteria that have been made; 2) Determine the average score that has been obtained for each student creativity assessment format; 3) Change the score in the form of a percentage value; 4) Determine the category of the results of the student creativity assessment format.

The instruments that will be used in this research are the observation sheet of the implementation of models *Problem Based Learning* and test sheets. The purpose of observing the implementation of the PBL model is to assess teacher performance when implementing the learning process using the PBL model. The components assessed are the ability to open learning, teacher attitudes during learning, mastery of teaching materials, implementation of learning steps, evaluation of learning, ability to close learning. While the test sheet is used to obtain the results of creativity and student learning outcomes. The student learning outcomes test sheet is obtained from the scores in the creativity test sheet. Individual student learning outcomes are said to be complete if the overall value of individual students reaches 75. While the learning outcomes of students are classically said to be complete if the number of students who get a score of x 75 exceeds 80%.

While the ability of students' creativity is measured through the fulfillment of creativity, namely: 1) aspects of fluency shown by students being able to solve problems correctly and on time that have been determined; 2) the flexibility aspect shown by students can solve problems in more than one way correctly; 3) the original aspect shown by students can solve the problem in their new way correctly; 4) the detailing aspects shown by students can Students solve the questions in a detailed manner correctly.

RESULT AND DISCUSSIONS

The effectiveness of learning in this study in terms of learning outcomes and creativity. The Problem Based Learning model is said to be effective if the results of the implementation of PBL learning, creativity, and student learning outcomes in this learning are at least categorized as good. While it is said to be less effective in learning outcomes and creativity if it does not meet the specified criteria. Creativity is measured through aspects of fluency, flexibility, originality, and detailing. While the learning outcomes obtained from the scores in the creativity test sheet

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The results of research that have been done, show the percentage of students' creativity in the indicators of fluency to get an average percentage of 85.8% are in the very good category. For the flexibility indicator, an average percentage of 82.8% is in a good category. For the original indicator at the first meeting, the average percentage of 75.7% was in a good category. In a detailed indicator, the percentage of 87.8% is in the very good category. From the description of the data above it can be concluded that the implementation of learning with the model is *Problem Based Learning* included in both categories of the criteria of student creativity.

Student learning outcomes data obtained from the results of student creativity test scores. Student learning achievement tests are carried out after applying the model *Problem-Based Learning*. On the test of student learning outcomes which is declared complete 27 students means that the scores obtained reach individual completeness standards with the acquisition of a score of 75, besides there are students whose scores have not yet reached individual completeness, meaning that the scores obtained <75. The percentage of student learning outcomes is classically shown in Table 1 below.

Table 1 Percentage of Student Learning Outcomes Classically

Value	Number of Students	Percentage	Information
≥ 75	27	81,81%	Completed
< 75	6	18,18%	Not Completed

In table 1 student learning outcomes there are 20% of students get a maximum score, besides, there are 18.18% of students in the less category where the student gets <75 from a maximum score of 100. This is because students are not careful in working on the problems and understanding the questions so get a value of less than <75. Overall student learning outcomes get an average value of 81.81% this means that the results of learning mathematics with the model are *Problem Based Learning* included in both categories of student learning outcomes criteria. The percentage of student learning outcomes classically is shown in table 2 below.

Table 2: Achieving success Problem-Based Learning Effectiveness Model

No	Indicator	Percentage of success	Achievement Effectiveness criteria
1	Implementation of the *Problem Based Learning* model		
	a. Preliminary activities	a. 92,21 %	a. Very good
	b. Core activities	b. 96,41 %	b. Very Good
	c. Closing activities	c. 81,47 %	c. Very Good
2	Creativity	82,0%	Good
3	Student learning outcomes	81,81%	Good

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Based on table 2, the implementation of the problem-based learning model in the preliminary activities, core activities, and closing activities are categorized as very good. Student creativity is categorized as good and learning outcomes are categorized as good. Because the three aspects above meet the minimum good criteria so it can be concluded that the model of *problem-based learning is* effective in creativity and student learning outcomes.

The effectiveness of using models in *Problem Based Learning* terms of creativity and student learning outcomes. Based on the results of research that has been presented PBL models are effective on creativity and student learning outcomes. This is indicated by the results of students' creativity ability by 82.0% in the good category and student learning outcomes by 81.81% in the good category. The results of this study are in line with research conducted by Wulandari & Surjono (2013) the use of *problem-based learning* models is more effective than conventional models in mathematics learning when viewed from student creativity. However, the research of Wulandari & Surjono (2013) aims to find out the *problem-based learning* model more effectively than conventional models in mathematics learning. While researchers measure the effectiveness of the PBL model in terms of students' creativity and learning outcomes.

The results of the implementation of learning that obtained the highest average are in the aspects of core activities. In the third syntax guiding individual and group investigations have been carried out by the teacher very well. Because in guiding individual and group investigations, the teacher allows students to dialogue and discuss one group with other groups and monitor discussion activities. So that learning outcomes occur student interaction in learning both within groups and with other groups so that problems can be resolved properly. This is in line with the statement (Iskandar, 2009) group discussion activities can make students interact with each other so that they can solve problems well. Based on the description of observations it can be concluded that overall the Problem Based Learning model is categorized very well. This is in line with research (Buyung, 2017) which states that the PBL model is categorized very well.

Measurement of the effectiveness of the model in *Problem Based Learning* terms of student creativity that has been done by students after the learning. The average creativity of students is 82.0% in the good category. It can be concluded that the model is *Problem Based Learning* effective in terms of student creativity. The results of this study are in line with research conducted by Sari & Angreni (2018) which states that the PPA model is effective in terms of student creativity. Besides that, in Sari & Angreni's research (2018) the application of model *Problem-Based Learninglearning* has an increase in student creativity. At the beginning of learning, the average percentage of students' creativity is 30%, then with the application of *Problem Based Learning*, the average percentage rises to 80%, which is categorized as good. However, Sari & Angreni's research (2018) aims to increase student creativity while this research is used to determine student creativity.

So it can be concluded the use of models *Problem Based Learning* can encourage students to further develop their creative abilities. This happens because, in the learning process, the model *Problem-Based Learning* emphasizes the active role of students to solve problems and associate ideas and find ways to solve mathematical problems

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(Widyastuti and Sujadi, 2018). Research findings (Samsinar and Ibrahim, 2015) state that the model is *Problem Based Learning* effective in student creativity.

Measurement of the effectiveness of the model in *Problem Based Learning* terms of student learning outcomes that have been done by students after learning. The average percentage of student learning outcomes is 81.81% which is categorized as good. The results of this study are in line with research conducted by Sujadi (2015) which states that indicators of the success of student learning outcomes are said to be classically complete if the percentage of completeness is 80% overall. However, Sujadi's (2015) research aims to improve student learning outcomes while in this study it is used to determine student learning.

It can be concluded that the model is *Problem Based Learning* effective in terms of student learning outcomes. This research is supported by previous research conducted by (Mayangsari, 2017) which states that by using the model *Problem-Based Learning* student learning outcomes are higher than the lecture method applied to students so that, it can be concluded that *Problem Based Learning learning is* effective in terms of learning outcomes. Research conducted by (Surya, 2018) also concludes that the model is *Problem Based Learning* effective against student learning outcomes because there are> 80% of students getting good learning outcomes where students get grades above the specified KKM.

This section presents research results that have been processed under the analysis of the data used. The presentation of research results can use tables or graphs as a means to explain the results of the study. The results of the study are in line with the problems raised so that the explanation in this section can be explained through subsections.

CONCLUSION

Based on the results of the above studies that have been carried out on the implementation of models in problem-based learning effective terms of student creativity and learning outcomes. This is indicated by the average percentage of learning accomplishment of 90.03% which means that it is implemented very well. The average results of creativity obtained by students get 82, 0% categorized as good. And also the acquisition of the average percentage of student learning outcomes obtained by students get 81.81%, which means more than> 75% of students get learning outcomes above KKM.

REFERENCES

Amalia, E., Surya, E., & Syahputra, E. (2017). The Effectiveness Of Using Problem Based Learning (Pbl) In Mathematics Problem Solving Ability For Junior High School Students. *Ijariie-Issn(O)-2395-4396*, *3*(2), 3402–3406. Retrieved from www.ijariie.com

Astriani, N., Surya, E., & Syahputra, E. (2017). the Effect of Problem Based Learning To Students ' Mathematical the Effect of Problem Based Learning To Students '

ISSN : 2579-5724
ISSN : 2579-5260 (Online)
http://ejournal.umm.ac.id/index.php/MEJ

Mathematical Problem Solving. *International Journal Of Advance Research And Innovative Ideas In Education*, *3*(February), 3441–3446.

Cahyaningsih, U., & Ghufron, A. (2016). Pengaruh Penggunaan Model Problem-Based Learning Terhadap Karakter Kreatif Dan Berpikir Kritis Dalam Pembelajaran Matematika. *Jurnal Pendidikan Karakter*, (1), 104–115. https://doi.org/10.21831/jpk.v0i1.10736

Moleong, & Lexy. (2006). *Metode Penelitian Pendidikan*. Bandung: Remaja Rosadakarya.

Munandar, & Utami. (2009). *Pengembangkan Kreativitas Anak Berbakat*. Jakarta:

Padmavathy, R. D., & Mareesh, K. (2013). Effectiveness of Problem Based Learning In Mathematics. *International Multidisciplinary E-Journal*, *II*(I), 45–51. Retrieved from www.shreeprakashan.com

Rizkia, S. A. (2017). the Influence of Ethnomathematics-Contained Problem Based Learning Model and Mathematical Disposition Skill Toward Mathematical Representation. *Mathematics Education Journal*, *1*(2), 8. https://doi.org/10.22219/mej.v1i2.4624

Surya, E., Syahputra, E., Yuniza Eviyanti, C., & Simbolon, M. (2017). Improving the Students' Mathematical Problem Solving Ability by Applying Problem Based Learning Model in VII Grade at SMPN 1 Banda Aceh Indonesia. *International Journal of Novel Research in Education and Learning*, *4*(2), 138–144.Retrieved from https://www.researchgate.net/publication/318529138

Widayanti, L. (2013). Peningkatan Aktivitas Belajar Dan Hasil Belajar Siswa Dengan Metode Problem Based Learning Pada Siswa Kelas VIIA MTs Negeri Donomulyo Kulon Progo Tahun Pelajaran 2012/2013. *Jurnal Fisika Indonesia UGM*, *17*(49), 32–35. https://doi.org/10.22146/jfi.24410

Wulandari, B., & Surjono, H. D. (2013). Pengaruh problem-based learning terhadap hasil belajar ditinjau dari motivasi belajar PLC di SMK. *Jurnal Pendidikan Vokasi*, *3*(2), 178–191. https://doi.org/10.21831/jpv.v3i2.1600

Yustianingsih, R., Syarifuddin, H., & Yerizon, Y. (2017). Pengembangan Perangkat Pembelajaran Matematika Berbasis Problem Based Learning (PBL) untuk Meningkatkan Kemampuan Pemecahan Masalah Peserta Didik Kelas VIII. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *1*(2), 258. https://doi.org/10.33603/jnpm.v1i2.563