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Application Model Problem Based Learning for Improved Performance Skills (Performance) and Performance Results Study Mathematics Student Statistics Material Class X-5 SMA N 1 Merbau

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ABSTRACT
This research aims to find out whether the *Problem* model is applied *Based Learning* can provide Improved Performance Skills and Performance Results Study Mathematics Student Class X-5 SMA N 1 Merbau. The subjects of this research were students in class X-5 of SMA Negeri 1 Merbau, Merbau District, North Labuhanbatu Regency, North Sumatra Province, totaling 32 students. This research was carried out in two cycles, each cycle consisting of 2 meetings, each meeting with allocated 90 minutes of learning time. Each cycle includes four steps, namely planning, action, observation and reflection. The results showed that performance increased in cycle 1 amounted to 22.50%, in cycle 2 it was 38.75%, there was an increase of 16.25%. Improved performance Study Average math pre-cycle 30.75, cycle 1 average 65.08, on cycle 2 average 72.50. This research has 2 cycles, because in cycle 2, student learning achievement reaches an average of 70, The application of the PBL model needs to be applied and continued in learning because it exists enhancement Good performance nor performance learning outcomes.

Keywords : PBL, Performance, Achievement results Study

Introduction

Education plays an important role in improving the welfare of society because education is a vehicle for improving and developing the quality of human resources. In line with industrial development and globalization, many changes occur in life, so that humans are challenged to have the ability to face these changes. The increasingly rapid development of the world of education places demands on institutions education to better adapt to developments in science. Educational problems cannot be separated from learning problems because learning is the core of the educational process. Improving the quality of education refers to efforts to improve the quality of learning processes and outcomes. An education system is said to be quality in terms of process if the teaching and learning process is effective and students experience a meaningful learning process and are supported by adequate resources. Therefore, a lot of special attention is given to the development and progress of education which is expected to improve the quality and quality of education. With regard to all of this, the entire driving force in the education sector, teachers are the most crucial implementing force. In fostering student enthusiasm and motivation for learning so that it will be able to improve the quality of learning. For this reason, teachers must be able to choose and use strategies in teaching and learning in order to achieve learning goals effectively and efficiently. Next is a change in learning paradigm from student in Work in a way individual Then switch in a way group in solve problem,

problem can be solved with *base learning* that can be done resolved in a way group And collaborate in reach objective Study. The teacher's job is to provide direction and learn or service Which pleasant for student. Observations made by researchers in SMA N 1 Merbau that there are not enough students enthusiastic And passive in follow process Study teach with method classic, There are still many students who enjoy playing games on line from gadgets, steal time read *WhatsApp* -an, finish task not optimal, still dependent on her friend. Not willing to appreciate her friend moment her friend presentation, test tend cheat with her friend, No believe self. By paying attention to the above circumstances so required method And model learning that will be able to activate participant, increase performance student And Mathematics learning innovation in high school. By because That chosen Model Problem Based Learning (PBL) in Mathematics learning to improve performance and achievement results Study student Class X-5 in Senior High School N 1 Merbau, Year Lesson 2022/2023. Model PBL chosen For finish problems in the X-5 class due to inclination Passive students need to improve their performance And performance results learn it. Based on background behind And problem identification then problem formulation in research This is (1) How process learning Mathematics with model PBL to improve class student performance X-5 in SMA N 1 Merbau. (2) How process learning math with model PBL For increase student achievement in class X-5 at SMA N 1 Merbau? This research was conducted with a purpose to: (1) Improve class student performance X-5 at SMA N 1 Merbau via application of the PBL model in learning Mathematics. (2) Improving learning achievement students in class X-5 at SMA N 1 Merbau with application Model PBL in learning Mathematics. Learning Mathematics is knowledge about logical reasoning and dealing with numbers , quantitative facts and problems about space , shape and logical structures.

Performance

The term performance is a translation of *performance* which is often interpreted by para intellectuals as "appearance", "show Work", or "Results" (Jeremias Q. Keban, 2004: 191). Understanding performance according to KBBI There are 3 meanings, including: 1) Something that achieved, 2) Results Which shown, 3) work ability. Etymologically, performance is A say Which in Language Indonesia originate from say base "Work" Which also means the result of work. So understanding performance in the organization is the answer of the success or failure of organizational goals Which has set. Different from Bernardin and Russell (1993: 379) in Jeremiah Q. Keban (2004:192) defines performance as *the record of outcomes produced on a specified job function or activity during a specified time period.* In definition This, aspect Which emphasized by second author the is notes about outcomes or results end Which obtained after a job or Performance is executed over a certain period of time. Therefore performance only refers on series results Which obtained a employee during period certain And No including characteristics personal employee Which assessed. There are 10 aspects of performance observed: (1) Listen in a way active, (2) Convey argumentation, (3) Will to ask, (4) Appreciate contributions, (5) Cooperation in finish task, (6) Accept responsibility, (7) Respect difference individual, (8) Disclose disagreement, (9) Taking turns and share task, (10) Performance is all type work who are successful and whose achievements show proficiency something nation according to Adi Nugroho. According to WJS Poerwadarrninta (1987: 767) state that performance Study is results Which achieved the best according to the child's abilities at a certain time to things Which done or done. So learning achievement is a result learning that has been achieved according to ability Which No owned And be marked with development and changes in behavior on self somebody Which required from Study with time certain, performance learn this can expressed in the form of grades and test results or exam. Performance results Study calculating mathematics lessons . Performance Study Which will used as a variable study is realm cognitive.

Learning Outcomes Achievement

Performance is all type work who are successful and whose achievements show proficiency something nation according to Adi Nugroho. If according to WJS Winkel Poerwadarminta, "achievement is a result achieved". Based on the opinion above, the author concluded that achievement is everything maximum human effort with results Which satisfying. So learning achievement is a result learning that has been achieved according to ability Which No owned And be marked with development and changes in behavior on self somebody Which required from Study with time certain, performance learn this can expressed in the form of grades and test results or exam. Performance results Study lesson.

Problem Based Learning Model

Problem based learning is a learning model that prioritizes how active students are in always thinking critically and always being skilled when faced with solving a problem. The process of how students learn depends on how complex the problems they face are. According to Duct (2020:15). Duch explained that problem based learning is a learning system that challenges students in learning how to learn. Working together in groups, the aim of this process is to find solutions to problems in the world that are real and occur.

Objectives of Problem Based Learning

Problem based learning method is a problem in the real world, while students certainly do not have all the experience in dealing with unexpected conditions. Because of this, problem based learning has several specific targets to achieve. The objectives of implementing this program on the quality of students are as follows : (1) To improve students' critical thinking skills in choosing and deciding something (2) Provide training in solving problems systematically, maturely and planned so that the results are positive (3) Problem based learning is used to help students correctly understand the role of adults in life (4) There is encouragement for students to be able to become independent and responsible individuals.

Problem Based Learning Stages of Learning

According to Suprijono (2010:73) that problem-based learning consists of five phases and behaviors. Phase 1: provide orientation about the problem to students, phase 2: organize students to research, phase 3: assist with independent and group investigations, phase 4: develop and present artifacts and exhibits and finally phase 5: analyze and evaluate the problem solving process (Sunaryo, 2014:43).

Research Methodology

Study held at SMA N 1 Merbau Manufacturing plan actionbased on reflection Which written onproposal implemented on date 6 February 2023, research done in in class X-5: for problem determination, organizing Study, guidance,presentation and evaluation. Problem solving every group given problem Which different,from problem the discussed the solution, student write question, create picture illustrations, identify problem with write is known, asked, answer problem. Then interestingconclusion of the problem, next afterstudents complete , students presentation and evaluate the result. Study action class This will carried out in class X-5 SMA N 1 Merbau even semester of the academic year 2022/2023, with the number of students whobecome subject study is 32 Student. This research uses a design *classroom action* research *research*) with follow model Which developed by Kemmis and Mc Taggart(1990:14), Which Then by Suharsimi Arikunto (2006:16) and Yoko Rimy (2008:12) explained as following:
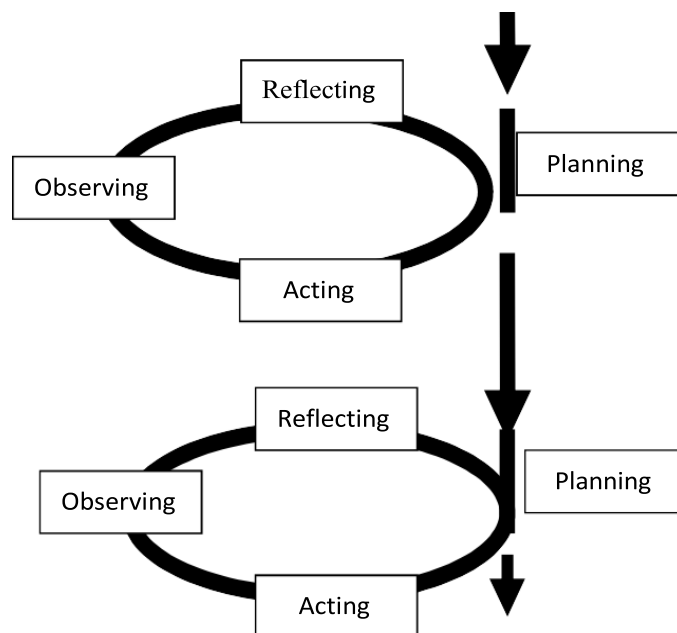
Picture 1. Kamiis and Taggart Cycles

The action plan is carried out in two cycle, every the cycle consists from 2 stareface to face, once face to face 2 x 45 minutes. Every The cycle includes 4 stages, namely: planning, implementation, observation And reflection. Activity planning done on each meeting in One cycle. On cycle I : (1) Planning: (1) Prepare teaching materials, paperA3, whiteboard marker color, script question post test, sheetevaluation performance (2) Prepare form questionnaire, regarding the application of PBL as a reflection.

Implementation on Meeting 1:
1. The teacher communicates the objectives of learning statistics
2. Student shared to in group 4-5 Groups, every group discussproblem Which different,
3. Teacher share problem to group

Student work on a given problem by collecting data, make illustration drawing, bar chart writing is known ,asked, process solution problem And interesting conclusion end from problem, at meeting 2:
1. Student in a way group prepare results problem solving to be presented in front of class
2. Teacher direct system methodpresentation And rule the game
3. Student present the results of settlement discussionsproblem Which has made
4. Held askanswer
5. Teacher collaborators record performance students according to the performance format
6. Teacher as guidance if there are any problems you can answer that group which presentation
7. After all group presentation Then held post test

Activity observation done Teacher researchers and collaborators on student performance in discussion group, process solutionproblems, class discussions (presentations) and teachers the researcher corrected the post test and then the results included in the list of values (achievements) Study Student. Reflection at the end of cycle I Students are givenquestionnaire about learning with models PBL in Learning mathematics as reflection For discuss findingsin learning. Reflection is done tooby researcher even improve students' performance skills

Technique Collection Data And AnalysisData

Gathering data done with performance instruments and learning outcomes instruments (cognitive). For performance instruments there are 10 indicator : (1) Listen in a way active, (2)Convey argumentation, (3) Will to ask, (4) Appreciate contributions, (5) Cooperation in finish task, (6) Accept responsibility, (7) Respect difference individual, (8) Disclose disagreement, (9) Taking turns and share task, (10) Compromise in finish task. The learning achievement that is measured is the result worksheet resulting from group discussion, with give a writing question mark with a score of 10, illustration of a score of 30, a known score of 10, asked score 10, completion problem score 30,conclusion 10 And Technique For results Studywith stage post test, question form Multiple choice questions outlined in a total of 10 questions containing draft And calculation. Data results observation, notes Teacher, Open questionnaires were analyzed descriptivelyFor know quality process Study teach. For know enhancement The quality of learning outcomes is carried out by means combine results discussion group with results post test Then averaged (Performance Study cognitive). Data analysis techniques were carried out with technique descriptive qualitative And quantitative, ie with describe data about Student performance during the learning process is good in process planning problem, results problem solving, group discussions and discussion class in form Presentation And Ask answer, description quantitative with describe performance from results questionnaire students regarding the application of the PBL Model at the end Student learning processes and achievements from grades results discussion And post test Good on cycle I and so on.

Results and Discussion

The results of research carried out in class learning mathematics, the implementation of actions and results are :

Results Performance on Cycle I

Observation Results There are 10 aspects of performance student (1) hear in a way active, (2) convey argumentation, (3) will ask, (4) value contribution, (5) Cooperation finish task, (6) accept responsibility, (7) respect difference individual, (8) disclose disagreement, (9) took a turn and share task, (10) compromise in finish task.

Table 1. Student performance results Meeting 1

No	Cycle Performance	%
1.	Hear in a way active	25.00
2.	Delivering argumentation	34.38
3.	Will asked	37.50
4.	Value Contribution	31.25
5.	Collaboration on assignments	25.00
6.	Accepting responsibility	18.75
7.	Appreciate opinions	18.75
8	Discloselack agree	3.13
9	Take a turn and share task	15.63
10.	Compromise in finish task	15.63
Average Performance Students		**22.50**

The table shows student performance average 22.50, caused in 2 O'clock lessons for discussion to solve problems in group, There is Which Still Relax, discussion No talk context (chat), No focus on topic talks, so that moment requested collected a number of group No finished. There is group Which No write variable in question but write down with words so it doesn't get a score maximum, And No write conclusion.

Results Performance on cycle 1

Table 2. Performance Study Physics on Cycle 1

No	Cycle 1 Performance Study	Pre Post Cycle	Post Test
1.	Mark Minimum	13	27
2.	Mark Maximum	50	87
3.	Completness	0	13
		0%	40.63%
4.	Mark Average	30.75	65.08
5.	Strengthening (Gain)		34.33

The table shows an increase average value from 30.75 to 65.08 and increase in student completeness from 0% to 40.63 %. Matter This show application model PBL can increase performance learning mathematics statistics material.

Reflection on cycle 1

The results of the research carried out using classroom action research in cycle I, namely by applying the Problem Based Learning (PBL) learning model to the basic competency of solving problems in mathematics lessons in class good category. Average Results Performance Students 22.50 and student achievement results average value from 30.75 to 65.08 and increase in student completeness from 0% to 40.63 %. Based on the results of observations and learning outcomes obtained by students in cycle I, the researcher will reflect in order to improve the learning process in cycle II by applying the Problem Based Learning learning model. Based on the data obtained, it can be concluded that the reflection in cycle I is as follows: (1) Motivate students to dialogue to find solutions to problems that they consider to be the most correct (2) Directing students to solve the problems given by applying the steps of the problem solving model (3) Guiding students in organizing assignments or sharing assignments with their group friends.

Table 3. Student performance results Meeting II

No	Cycle Performance	%
1.	Hear in a way active	75.00
2.	Delivering argumentation	64.38
3.	Will asked	77.50
4.	Value Contribution	71.25
5.	Collaboration on assignments	65.00
6.	Accepting responsibility	78.75
7.	Appreciate opinions	78.75
8	Disclose lack agree	63.13
9	Take a turn and share task	65.53
10.	Compromise in finish task	65.63
Average Performance Students		**70.50**

Table 4. Performance Study Physics on Cycle II

No	Performance Learning Cycle II	Pre Post Cycle	Post Test
1.	Mark Minimum	27	35
2.	Mark Maximum	87	95
3.	Completness	13	20
		40.63%	60.25%
4.	Mark Average	65.08	72.50
5.	Strengthening (Gain)	7.42	

1, mark minimum 27, mark maximum 87, completeness 40.63%, mark average obtained 65.08, whereas results post test cycle 2, mark minimum 35, And mark maximum still 95, due to the strengthening time being much larger compared to cycle 1, completeness was 40.63%, still, mark average from 65.08 become 72.50 Also There is increase , whereas strengthening 7.42.

Reflection on cycle 2

The results of observations of student activities in cycle I averaged 65 , namely with sufficient criteria (not yet meeting the criteria for achieving ideal student activity in learning, namely Pi ≥ 80%). This shows that the application of the Problem Based Learning learning model to the basic competency of solving problems in mathematics lessons in class X-5 of SMA Negeri 1 Merbau in cycle I has not been effective and needs to be continued with improvements in cycle I. Observation results of cycle 2 values minimum 27, mark maximum 87, completeness 40.63%, mark average obtained 65.08, whereas results post test cycle 2, mark minimum 35, And mark maximum still 95, due to the strengthening time being much larger compared to cycle 1, completeness was 40.63%, still , mark average from 65.08 become 72.50 Also There is increase , whereas strengthening 7.42. This shows that the application of the Project Based Learning learning model in mathematics lessons in class.

Conclusion

Based on the results of the research and discussion, several research conclusions were obtained, namely as follows: Implementation of learning using the Problem Based Learning Model is effective in improving performance and increasing learning outcomes in mathematics lessons. The suggestions that can be put forward in this research are: (1) The Problem Based Learning Model can be used by teachers as an alternative to improve student learning outcomes in basic competencies (2) Train students in expanding their thinking in solving problems in life that must be accepted (3) For mathematics teachers , using the Problem Based Learning learning model can provide direct training to students by honing and getting them used to critical thinking and skills in everyday life (4) For advanced researchers, it is recommended to continue research by applying the Problem Based Learning Model to other materials and schools, because this research only covers one basic competency.

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