



Application of the Project Based Learning (PJBL) Learning Model to Increase Student Activity and Learning Outcomes

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ABSTRACT

The aims of the research were to find out (1) to increase the activeness of studying the database for class XII RPL students at SMK N 4 Bandung using the project-based learning (pjbl) learning model (2) to increase the learning outcomes for class XII RPL students at SMK N 4 Bandung using the learning model PJBL This research is a type of classroom action research with a model developed by Kemmis and Mc. Taggart. The research subjects were students of class XII RPL Software Engineering Expertise Program (RPL) SMK Negeri 4 Bandung, with a total of 29 students. This study consisted of 2 (two) cycles where there were two meetings in each cycle. The data analysis technique uses descriptive qualitative analysis. The research success criteria set for student learning activeness is 75.00% of students are actively involved both physically, mentally, and socially in the process of learning activities and for student learning outcomes is 75 for a rating scale of 1-100. The results showed that the application of the PJBL learning model could increase the activity and learning outcomes of class XII RPL students at SMK Negeri 4 Bandung. The average learning activity of XII RPL students in the pre-cycle only reached 35.33%. After applying the PJBL learning model in cycle I, the average student learning activity increased to 60.13% and in cycle II it increased to 81.02%. Based on these results, the hypothesis in the study was accepted.

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1. INTRODUCTION

Implementation of the 2013 curriculum is one of the efforts to improve the quality of formal education in Indonesia (Simanjuntak, 2020; Wulandari, 2020), in its implementation the 2013 curriculum is a learning development process and one of them is a passive learning pattern into active-seeking learning (active-seeking student learning is further strengthened by a scientific approach learning model) as well as learning patterns individual into group learning (team-based) (Bagenda *et al.*, 2021; Said, 2019).

In selecting learning methods, teachers should always pay attention to student factors as learning subjects, because each student basically has different abilities and ways of learning from other students. It is these differences that can lead to the different needs of each individual student. But that does not mean that learning must be turned into individual learning, but rather an alternative learning that allows the fulfilment of the needs of all individual students is needed.

The ability to teach properly and correctly is one of the demands as an educator, so a teacher must be able to choose and use the right learning approach and in accordance with the material to be delivered and must consider the level of student development. The approach applied to the 2013 curriculum is a scientific approach (Wulandari, 2020), namely an approach that places more emphasis on learning that activates students and one of the models in the scientific approach is the project-based learning model.

In the learning process, actually there is already active student activity in the class, it's just that the activity that is carried out by most students is an activity that should not be carried out in learning such as actively talking to themselves when the teacher is explaining material, busy playing laptops which should not be done in theory learning, when the teacher asks questions, most students do not want to answer and do not want to ask when asked if there is material that is not clear, especially in learning databases. This causes a lack of student learning outcomes for the material presented in the Database lesson.

The use of learning methods that do not vary can result in students feeling bored and bored, so that the learning process is less effective, and the learning objectives are not achieved as expected. Based on the responses of some students about the lecture method used by the teacher in teaching, they tend to feel bored and bored during learning because the teacher only lectures in delivering material. Therefore, to create a more effective learning process, increase the interaction that occurs with students and increase student learning activeness, it is necessary to apply a variety of teaching methods in the learning process.

The solution to overcome the learning problems of class XII students in the Software Engineering expertise program is to apply a project-based learning model. The reason for choosing project-based learning is because by using this learning model, besides being required to be active in making projects students are also required to be active in learning so that the material studied can be completed according to the learning objectives. Project Based Learning (PjBL) is a learning model that requires teachers and/or students to develop a guiding question. Bearing in mind that each student has a different learning style, thus providing opportunities for students to explore content (material) using various meaningful ways for themselves and conducting experiments collaboratively and is a learning approach that pays attention to student activity. Students explore, assess, interpret, and synthesize information in a meaningful way.

2. METHODS

The research conducted is Classroom Action Research (PTK) or Classroom Action Research (CAR) which focuses on efforts to change the existing real conditions towards the expected conditions. This research is qualitative research that aims to improve and find solutions to real and practical problems in improving the quality of classroom learning that is experienced directly in interactions between teachers and students who are learning. The book *Introduction to Classroom Action Research* that they wrote, it is explained that there are several models or designs of Classroom Action Research that can be applied and one of them is the Kemmis & McTaggart model.

In accordance with the type of research chosen, namely classroom action research, this research uses the action research model from Kemmis and McTaggart, which is a spiral of cycles one to the next cycle. Each cycle includes 1) planning, 2) action, 3) observation and 4) reflection (Khasinah, 2013). The steps in the next cycle are revised planning, action, observation, and reflection. Before entering the first cycle, a preliminary action is carried out in the form of problem identification and is often referred to as the pre-cycle. The Classroom Action Research Cycle according to Kemmis & McTaggart from each stage of its implementation in research can be seen in **Figure 1**.

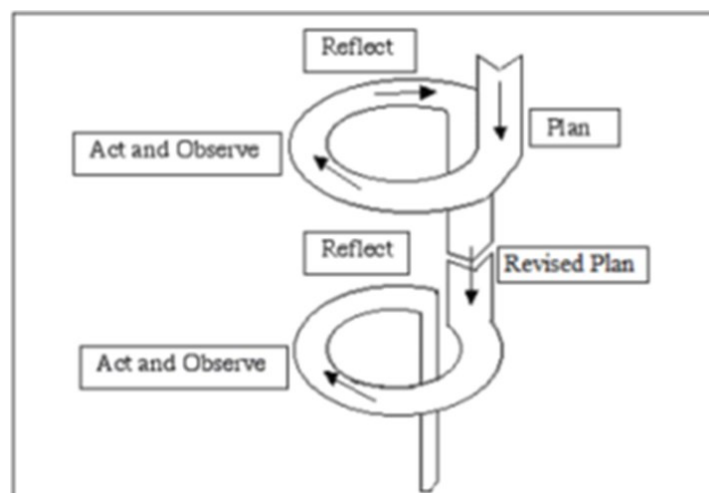


Figure 1. Kemmis & Taggart Model Cycle.

The explanation of the flow above is:

- (i) **Planning (Plan):** Before conducting research, formulate problem formulations, objectives and create action plans, including making research instruments, namely observation sheets, student learning activity questionnaires, and interview guidelines, as well as making learning tools such as salabus and Implementation Plans Learning (RPP).
- (ii) **Implementation and observation (Action and Observation):** Includes actions taken as an effort to build students' understanding of concepts namely the application of project-based learning (Pjbl) learning models and observing the results or impacts of implementing project-based learning (pjbl) learning models the.
- (iii) **Reflection:** The act of reviewing or analyzing, viewing, and considering the results or impacts of the actions taken based on the observation sheet filled in by the observer. This reflection stage is the decisive stage, which is to determine what action should be taken next, whether the application of learning should be carried out in the next cycle or should be stopped because it has reached a predetermined target that is in accordance with the indicators of learning success.

- (iv) Revised Plan: A plan designed by a researcher based on the reflections of observers in a particular cycle to be implemented in the next cycle.

2.1. Data Analysis

Data analysis in this study was carried out before entering the field, while in the field, and after leaving the field. Before entering the field, an analysis is carried out on the data from the preliminary study which will be used to determine the focus of the research. Data from research results while in the field were processed and analyzed using descriptive qualitative method.

Data reduction means summarizing, choosing the main things, focusing on the important things, looking for themes and patterns. Thus the reduced data will provide a clearer picture and can make it easier to carry out further data collection. Presentation of data is done to organize data which is a systematic arrangement of information from the results of data reduction starting from planning, implementing, observing, and reflecting on each cycle. It can be presented in the form of short descriptions, charts, flowcharts and the like, but what is often used is to present data in the form of narrative text. Drawing conclusions is an effort to find the meaning of data, record the regularity and classification of data. The collected data is presented systematically and needs to be given meaning so that it can be understood by the reader.

2.2. Research sites

The location of this classroom action research was conducted at SMK N 4 Bandung which is located at Jl. Klindungan No. 6, Turangga, Kec. Lengkong, Bandung City, West Java 40264. The subjects of this study were students of class XII RPL for the 2020/2021 academic year. The following shows a floor plan of SMKN 4 Bandung (see **Figure 2**).



Figure 2. Layout of SMKN 4 Bandung.

3. RESULTS AND DISCUSSION

The research was conducted at SMK Negeri 4 Bandung in class XII RPL students, totaling 29 students. The initial research activities were carried out on Monday, August 10, 2020, by observing students' active learning at school during the learning activities and interviews with Database subject teachers to find out the initial conditions of Class XII RPL related to Database learning in class. Based on the results of interviews with the Database subject teacher, namely Mr. Moh. Ali Aljauhari, S.Kom on August 10 2020 that the learning activities of class XII RPL students are still lacking, enthusiasm for learning is good but still needs to be improved. This is known because during the learning process, for example during practice, when the teacher explains the material that will be or is being practiced, many students still do not pay attention and carry out the instructions given. Mr Moh. Ali Aljauhari added, he had tried using other learning methods besides lectures and usual practice, namely the question-and-answer method, but the results were not optimal. The result of implementing this method was felt to be less effective and, in the end, it continued to use the lecture method and practice as usual.

In accordance with the observational data obtained at this pre-cycle stage, during the learning activities students tend to be passive, the teacher uses less varied learning methods, namely by lecturing in front of the class. During the learning process most of the students sat and listened to the teacher's explanation, students chatted a lot with other friends, did not take notes on the material presented by the teacher, and did not want to ask the teacher if there was material that was not clear. Most students do not carry notebooks. Student effort in doing the assignments given by the teacher is still low, not on time in submitting assignments and some are not doing the assignments that have been given.

Based on the application of the learning method, the principles described above, as well as the classroom action research stage, the following is an increase in student learning outcomes in cycle I and cycle II which are supported by research data that has been discussed in the research results sub-chapter.

3.1. Increasing Active Student Learning Cycle I and Cycle II

3.1.1. Visual activities

The behavior observed in the visual activity indicators is paying attention to the explanations of the teacher and friends when explaining the material/presentation. The results of observations in Cycle I showed that 82.27% of students had carried out visual activities and had passed the cycle I target for visual activity indicators, namely 70.0%. The results of observations in cycle II showed that 96.43% of students had carried out visual activities and passed the cycle II target for visual activity indicators, namely 80.0%.

Based on the results of observations in cycle I and cycle II, there was an increase in student activity in visual activities by 14.16% by applying the project-based learning (Pjbl) learning model in database learning.

3.1.2. Oral activities

The behavior observed in the oral activity indicators is 1) asking questions when the material provided is not clear. 2) discuss and submit the initial design that has been discussed with the group regarding questions at the beginning of the project. 3) Resubmit the design that has been submitted for improvement with group discussions.

The results of observations in Cycle I showed that 53.38% of students had carried out visual activities and had passed the cycle I target for oral activities, which was 50.0%. The results of

observations in cycle II showed that 78.35% of students had carried out oral activities and passed the cycle II target for indicators of oral activity, namely 75.0%.

Based on the results of observations in cycle I and cycle II, there was an increase in student activity in oral activities by 24.97% by applying the project-based learning (Pjbl) learning model in database learning.

3.1.3. Listening activities

The behavior observed in the listening activity indicators is 1) listening and paying attention to the explanations from the teacher or friends who are expressing opinions. 2) listen to instructions or orders given by the teacher and carry them out according to the orders given. The results of observations in Cycle I showed that 73.97% of students had carried out visual activities and had passed the cycle I target for listening activities, which was 70.0%. The results of observations in cycle II showed that 89.50% of students had carried out oral activities and passed the cycle II target for listening activity indicators, namely 80.0%.

Based on the results of observations in cycle I and cycle II, there was an increase in student activity in listening activities by 15.53% by applying the project-based learning (Pjbl) learning model in database learning.

3.1.4. Writing activities

The behavior observed in the indicators of writing activity is 1) making notes about the given material or project. 2) Fill in the project worksheet that has been given. The results of observations in Cycle I showed that 89.2% of students had carried out visual activities and had passed the cycle I target for writing activities, which was 70.0%. The results of observations in cycle II showed that 89.5% of students had carried out oral activities and passed the cycle II target for indicators of writing activity, namely 80.0%.

Based on the results of observations in cycle I and cycle II, there was an increase in students' activeness in writing activities by 0.3% by applying the project-based learning (Pjbl) learning model in Database learning.

3.1.5. Motor activity

The results of observations in Cycle I showed that 28.03% of students had carried out motor activities and had passed the cycle I target for motor activities, which was 25.0%. The results of observations in cycle II showed that 56.90% of students had carried out oral activities and passed the cycle II target for indicators of motor activity, namely 50.0%.

Based on the results of observations in cycle I and cycle II, there was an increase in student activity in motor activities by 28.87% by applying the project-based learning (Pjbl) learning model in Database learning.

3.1.6. Mental activity

The behavior observed in the indicators of mental activity is making decisions to determine the project to be made and making a project schedule. The results of observations in cycle I showed that 41.98% of students had carried out mental activities and had passed the cycle I target for mental activities, which was 40.0%. The results of observations in cycle II showed that 56.90% of students had carried out mental activities and passed the cycle II target for mental activity indicators, namely 50.0%.

Based on the results of observations in cycle I and cycle II, there was an increase in student activity in mental activities by 14.92% by applying the project-based learning (Pjbl) learning model in database learning.

3.1.7. Emotional activities

The behavior observed in the indicators of emotional activity is 1) brave and calm in responding to questions that are disproved by teachers or friends. 2) actively involved in making the project from the initial planning to the evaluation of the project. The results of observations in Cycle I showed that 52.07% of students had carried out emotional activities and had passed the cycle I target for emotional activities, which was 40.0%. The results of observations in cycle II showed that 77.66% of students had carried out emotional activities and passed the cycle II target for indicators of emotional activity, namely 70.0%.

Based on the results of observations in cycle I and cycle II, there was an increase in students' activeness in emotional activities by 25.59% by applying the project-based learning (Pjbl) learning model in database learning.

Based on the discussion of the results of observations of student learning activeness in learning databases by applying the project-based learning (PJBL) learning model, each activity indicator has increased activity so that it answers the formulation of the research problem, namely by applying the project-based learning (PJBL) learning model can increase student activity. XII RPL in Database learning while at the same time answering the research objective, namely an increase in student activity in learning Database class XII RPL SMK N 4 Bandung using the project-based learning (pjbl) learning model.

3.2. Improvement of Student Learning Outcomes Cycle I and Cycle II

In cycle I the project worksheets provided had an impact on student learning which was initially less active in taking notes in the end students were required to fill out the project worksheets. In cycle 1 the given project is the same, namely the Sql topic is level. The results of the correction of the Project Worksheet in cycle I have met the target for the value of the project worksheet, which is 70.0, because the average value of the Project Worksheet in cycle I is 79.7 and the results of the correction to the Project Worksheet in cycle II have met the target for the value of the project worksheet. that is equal to 75.0, because the average value of the Project Worksheet in cycle II is 80.17

In cycle II the results of the correction of the Project Worksheet increased from cycle I which initially was 79.7 increased to 80.17 this is because in cycle 2 students were given the option to choose a project from several projects provided, so students know better which project to the more they master, and they develop.

4. CONCLUSION

Based on the results of classroom action research that has been carried out in 2 (two) cycles in this study, it can be concluded that:

- (i) The application of the project-based learning (pjbl) learning model can increase student learning activity in the Database subject for class XII RPL SMK Negeri 4 Bandung.
- (ii) The application of the project-based learning (pjbl) learning model can improve student learning outcomes in the Database subject for class XII RPL SMK Negeri 4 Bandung.

Research suggestions are divided into three, namely for teachers and for students. The following is a further explanation of the research suggestions:

4.1. Teacher

First, the implementation of the implementation of the project-based learning (Pjbl) learning model requires the role of the teacher as a good facilitator in learning activities, therefore the teacher should always monitor student activities during teaching and learning

activities so that learning activities can run in a conducive and effective manner. Second, the teacher is expected to be able to apply a variety of strategies, methods or learning models, and be able to involve students in the process of learning activities so that students are not bored, enthusiasm in learning, and student learning activeness can increase.

4.2. Student

First, students should prepare well before participating in classroom learning activities, for example, be more active in seeking material information from sources other than books prepared at school, either from similar books with different authors or from sites on the internet. Second, students should be more active and enthusiastic in group learning, especially during discussions, making projects and presentations, so that assignments given by the teacher can be completed easily and quickly.

4.3. Other Researchers

First, it is necessary to conduct similar classroom action research but with a wider range of other material or with different subjects, so that it can be seen how effective the application of the project-based learning (Pjbl) learning model is in increasing student learning activeness in learning activities. Second, to achieve maximum research results, researchers should carry out the data collection process at the right time, not the Vocational Practice Examination and the National Examination. So that researchers can get to know students more closely, and the classroom action research process carried out can be carried out properly.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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