



**APPLICATION OF *PROBLEM BASED LEARNING MODEL* TO IMPROVE  
ACTIVITIES AND STUDENT LEARNING OUTCOMES OF CLASS XI IPA<sup>2</sup> OF SMA  
NEGERI 5 TIDORE ON COLLOIDAL MATERIAL**

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**Abstract:**

This research is a classroom action research (CAR) that aims to improve the activities and learning outcomes of students on colloidal material at SMA Negeri 5 Tidore Kepulauan through the application of the Model *Problem Based Learning*. The subjects of this research are students class XI IPA<sup>2</sup> SMA Negeri 5 Tidore Kepulauan even semester 2017/2018 school year totaling 23 people. The implementation of this research consisted of two cycles. The results showed that the application of the model was *Problem Based Learning* effective in increasing the activities and learning outcomes of students especially for colloidal material. The increase was seen from (1) the average learning outcomes of students who completed in the first cycle of 52.17% to 82.60% in the second cycle. (2) Student activity shows an increase in asking, answer, and respond to the discussion activities from 65.22% in the first cycle to 78.26% in the second cycle.

**Keywords:** Problem Based Learning, Colloid, Activities, Learning Outcomes

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## INTRODUCTION

Improving the quality of education is inseparable from the quality of learning implemented by teachers during the teaching and learning process in the classroom. The continuity of the learning process will determine the achievements of students both in the form of activities and their learning outcomes. For good quality of learning, teachers must know the characteristics of students as well as learning models and strategies, so that the learning process of chemistry, which is generally abstract in nature, can run conducive and does not seem monotonous.

One of the chemistry topics taught in high school especially in class XI IPA is about colloids, non-stoichiometric material characteristics are sometimes considered easy by some teachers because they assume that they are memorized. In colloidal material teachers tend to use direct learning models in the form of lectures, discussions, and assignments. Systematic delivery is still using conventional methods, namely conveying the concept, providing training, then giving the task. Students are rarely invited to explore in depth the concept of colloids especially with regard to problems in everyday life. As a result, students have difficulty providing solutions if they encounter these problems. The application of this direct learning model also has a strong influence on student learning outcomes, because this model does not support the creation of a conducive learning atmosphere and triggers students to be actively involved during learning.

Based on information obtained from chemistry teacher teachers in SMA Negeri 5 Tidore Kepulauan, student mastery of concepts and learning outcomes in chemistry is still relatively low, including colloidal material. The average percentage of students' completeness in the last 4 years of colloidal material was only 58.19%. One of the factors causing the low completeness of student learning is the application of direct learning models especially lectures that are more memorized oriented, so students are easily forgotten and have difficulty in answering questions during daily tests. In addition, students are also rarely actively involved in class.

There are actually several learning models that can be used as alternatives to improve student learning activities and outcomes. One of them is the model *Problem Based Learning*. Problem-based learning is a model in delivering subject matter that is based on the principle of using problems as an initial point in gaining new knowledge (Tritanto, 2014). This model is used to stimulate students' high-level thinking in real-world problem-oriented situations, including how learning (Ibrahim and Nur, 2000). The

definition above illustrates that the application of the model *Problem Based Learning* can trigger student learning activities and outcomes through student involvement. active and intense during the learning process. The participation of students during the learning process makes learning more meaningful and memorable. Real problems raised in learning make students interested in learning and explore more knowledge about the material being taught.

This is also supported by the results of research from a journal entitled "*Improvement of Nursing Student's Critical Thinking Skills Through Problem-Based Learning in the People's Republic of China: A Quasi-Experimental Study* (Yuan et al. 2008), reports that there is influence and increase students' thinking skills after applying the model *Problem Based Learning*

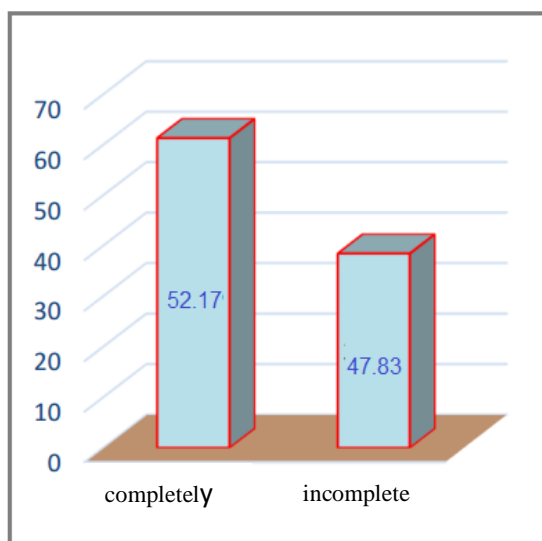
## **RESEARCH METHODOLOGY**

This research is research a classroom action (CAR) with stages of implementation including: planning, implementing actions, observing, and reflecting repeatedly. This class action research procedure was carried out in two cycles. Each cycle consists of 2 meetings (4 hours lesson).

During the study, researchers need peers as observers to do observation of student activities during the learning process take place and note things which is important for improvement learning. Repair Procedure learning includes activities implementation of action research class organized by Kemmis and Mc Targgat which consists of 4 stages, namely planning, action, observation and reflection.

## RESULTS AND DISCUSSION

The results of research using the Model *Problem Based Learning* in class XI IPA<sup>2</sup> SMA Negeri 5 Tidore Kepulauan on cycle I for colloidal material with a minimum completeness value (KKM) 75, obtained learning outcomes students presented in graph 1 below this.

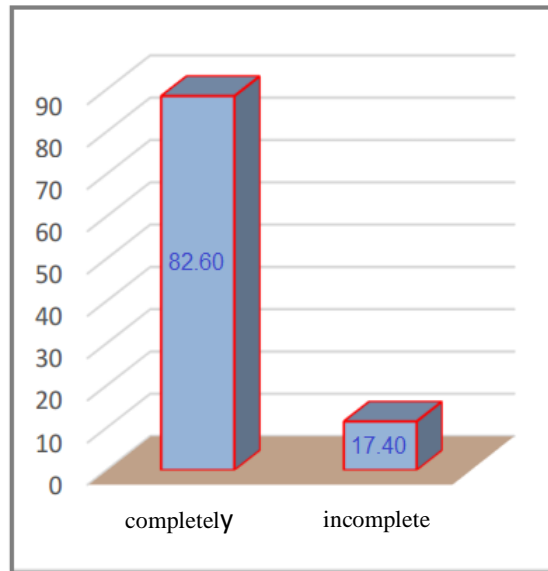


**Figure 1. Graph of Learning Cycle I Results**

From the graph above it can be seen that of the 23 students taught using the model *Problem Based Learning*, there were 12 students who finished with a percentage of 52.17% while those who were not yet complete were 11 people or 47.83%. These results show that almost half of the students have not yet reached the Minimum Mastery Criteria (KKM) which is set or incomplete. Allegedly, there are still many students who have not yet completed the application of the model *problem based learning* which is relatively new, moreover they are rarely allowed to be actively involved during the learning process.

In addition, the results of observations of student learning activities are still lacking, both in responding or giving opinions, answering teacher questions, asking questions, activeness in solving problems presented and concluding learning outcomes. The average student learning activity is still only 65.22%. This shows the low activity of students in learning using PBL in the first cycle.

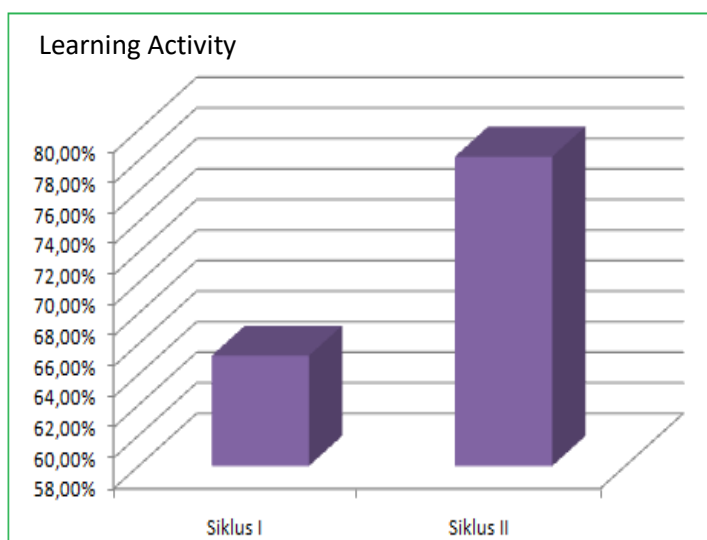
Based on observations of student activities and learning outcomes and discussing with peers from the results of reflection in cycle I, the researchers continued the implementation of cycle II by perfecting the material and subject matter and motivating students to actively involved during learning. After learning and doing the test the learning outcomes are as shown in the following graph:



**Figure 2. Graphic Learning Outcomes Cycle II**

The graph above shows as many as 82.60% or 19 students who have completed, while 17.40% or as many as 4 students have not yet completed. From the learning outcomes it can be concluded that learning in the second cycle has been successful because it has reached the classical completeness that is the target of 80%.

The results of observations on student learning activities in the second cycle also showed an increase with the category of "active", this can be seen from the intensity of student participation in learning both asking, responding, and concluding. Nevertheless they still have difficulty in dealing with the problems presented as well as efforts to solve these problems. An increase in activity in learning is because students are accustomed to actively involved both individually and in groups during learning. The average student learning activities in cycle 2 reached 78.26%. Increased student activity from the first cycle to the second cycle can be seen in the following graph.



**Figure 3. Graph of Learning Activities Cycle I and II**

## DISCUSSION

Learning activities using the model of *problem based learning* conducted as much as 2 cycles illustrates the increase in both the activity and student learning outcomes. The average student learning outcomes increased from 52.17% to 82.60%. Learning activities also increased from 65.22% in the first cycle to 78.26% in the second cycle. The habits of students who learn by using conventional models by relying on lectures as the main approach causes students a bit of trouble if asked to give opinions or interact with peers.

Through problem based learning, students are invited to solve problems in groups so that they can interact and be active in finding solutions to the problems presented.

Problem-oriented learning to be solved in groups makes students passionate in learning, they try to browse through a variety of literature and discuss to find sources and solutions to the problems presented to them. This certainly causes students to be active in learning to overcome existing problems. Contextual and interesting problems presented through problem-based learning make students interested as well as challenged to look for answers. Students look enthusiastic in discussing problems because they are directly related to daily life.

Problem-based learning makes student learning more meaningful, so they are easier to remember about the concept of colloids being taught. This has an effect on students' knowledge which is reflected in an increase in their learning outcomes.

## CONCLUSION

Based on the results of the study, it can be concluded that the application of the problem based learning model in SMA Negeri 5 Tidore Kepulauan on colloid material using the model *problem based learning* has increased ie from 52.17% to 82.60%. In addition, learning activities both asking, responding, and drawing conclusions also increased from 65.22% in the first cycle to 78.26% in the second cycle.

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