Implementation of STAD Cooperative Learning Model to Improve Student Result in Class XI IPA SMAN I Bangkinang for Buffer and Salt Hydrolysis Subject

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Abstract: This study aims to improve the results of students' chemistry learning of class XI IPA 1 of SMAN 1 Bangkinang City through the implementation of STAD on the subject of Buffer and Hydrolyzed Salt solution. This research was conducted in SMAN 1 Bangkinang Kota, Kampar District, Riau Province in the even semester of academic year 2015-2016. This research was conducted in January to March 2016. The subject of this study was 33 students of class XI IPA 1, SMAN 1 Bangkinang. This research is a classroom action research conducted in two cycles. The first cycle consists of three meetings and one daily repetition. The second cycle consists of three meetings and one daily repetition. There are five phase i.e. initial reflection, planning, implementation of action, observation and reflection. Data collection techniques used are observation techniques, and test techniques. The results show that the application of STAD cooperative learning model can improve student learning outcomes of class XI IPA 1, SMAN 1 Bangkinang City, especially on the subject of buffer and salt hydrolysis solution. The success percentage of this learning model increases from 59.98% to 81.81%.

Keywords: Cooperative Learning Active Stad; Learning outcomes; Buffer/buffer; Hydrolysis of Salts.

1. Introduction

To improve the quality of education can not be separated from the business that is how a teacher prepares their lessons, determining the learning objectives to be achieved, choose the appropriate method as well as utilize existing infrastructure. The purpose of learning chemistry in high school is to provide the knowledge to understand the concept of chemical concepts and coherence, and apply the scientific method involves process skills to solve problems in everyday life [8].

In practice, the learning process is a creation environment that enables the learning process. One of the environmental systems that need to be created is an environment that can motivate students to enjoy with the methods applied. As revealed by Ali (1996) that to conduct a teaching and learning process needs to think about the right method. The method used should be tailored to the materials and goals set, also can be adjusted to the activities undertaken. To that teachers should be able to choose an effective method to deliver students in achieving goals [2].

Alipandie (1984) reveals that teaching methods are one of the important educational tools and their role in determining success or failure of education or teaching, but a teacher must be able to determine the proper teaching method and teaching tool so that the material presented in accordance with the purpose which is expected [3]. In other words, if a teacher will choose a method that is considered reasonable and appropriate he should be guided to the goal to be achieved in teaching. School is a formal educational institution and also a sub-system of National education that plays an important role in efforts to improve the quality of human resources.
Chemistry is one of the natural science that plays a very important role in improving human resources, because chemistry is a natural science section that has the object of study in the form of living creatures and inanimate objects. In general, the purpose of chemical education according to Depdiknas (2007) is that students understand the concepts and interrelationships and are able to use scientific methods based on scientific attitude to solve problems encountered, so more aware of the power and greatness of its creator [6].

To achieve this we need some learning processes that enable students to be scientific. In this case the teacher plays a very decisive learning success. Teachers not only deliver learning material but act as a facilitator, motivator and mediator, which is expected to develop students' skills as optimal as possible so that students are active and creative learning. Teachers should be able to select and implement the strategy pembelajaran. One of the learning strategies that can enhance the activity and creatively in the learning process is a cooperative learning model student team achievement division (STAD). Based on the author's experience while teaching in class XI IPA 1 SMAN 1 Bangkinang city that has been going on, it can be said that:

1. The students are less active work on the assignment of teachers
2. Most students embarrassed to ask if the lack of understanding the lessons
3. less active and responsible in doing the task group, only showed the answer /friend's opinion
4. Less interactions among students in learning activities
5. less have the courage to express opinions or ideas

Besides the causes that are not less important is the number of students who are too many classes and books as learning resources that are less owned by students. As a result of the above problems cause the purpose of learning does not get satisfactory results, it is seen from the value of replication is still much that has not reached km which has been set that is 75 for chemistry subjects. Seeing the above symptoms need a renewal and improvement in learning, one of the learning model that allows to anticipate the weakness of conventional learning model is to use cooperative learning model type student achievement division team (STAD). In STAD students work together in small, heterogeneous groups to work on joint tasks, in which case students are helping each other so that all group members are ensured to understand the lesson. The success of the group depends on all members because in the quiz given by the teacher, in answering group members are not allowed to help each other. The advantages of this type of STAD are:

1. Students help each other and encourage each other to master the skills and concepts provided.
2. Students from a less active to become more active.
3. Eliciting a sense of responsibility to each member.
4. Promote interaction among students
5. Cultural embarrassed to ask to be less

Based on the background of the problems mentioned above, researchers interested in conducting research with the title "Implementation of STAD Cooperative Learning Model to Improve Student Result in Class XI IPA SMAN I Bangkinang for Buffer and Salt Hydrolysis Subject".

2. Related Works

Research related to the application of Cooperative learning Model STAD has been conducted on science learning in class VII.2 SMP Negeri 24 Palembang with the conclusion:

1. The learning process with learning model STAD can improve student learning activities VII.2 grade SMP Negeri 24 Palembang. Student activity increased from the first cycle to the second cycle of 16.6% in the classical style.
2. The learning process with model STAD can improve student learning outcomes. Learning model STAD that emphasizes discussion groups, where students who already understand the material being discussed should explain to students who do not understand on the material until it can be. Increased student learning outcomes from the first cycle to the second cycle of 20.0% completeness.

Furthermore, it has also been conducted on the teaching of physics in materials dynamic power in SMA Negeri 1 Stabat with the following results:
1. Influences of the learning model Cooperative Type STAD Integration of Characters on student learning outcomes in sub subject of Dynamic Electrical in Class X Semester II SMA Negeri 1 Stabat in academic year 2011/2012. It is seen from the average value of student learning outcomes in the classroom experiment that uses a learning model STAD Type Integration Character is 69.34. While the average student learning outcomes in grade control using conventional learning models is 61.96.

2. Character formation of students during the learning process of cooperative learning model STAD Type Integration Characters in Dynamic Electrical sub subject matter in Class X Semester II SMA Negeri 1 Stabat TP 2011/2012 increased better.

![Figure 1. The cycle of action research](image)

### 3. Material & Methodology

#### 3.1. Data

The research was conducted at SMAN 1 Bangkinang, Kampar city of Riau Province in the academic year 2015-2016. This research took place from January to March 2016. The subjects of this study were the students of grade XI IPA 1 SMAN 1 Bangkinang Kota which amounted to 33 people: 10 men, 23 women.
3.2. Method

The shape of this research is classroom action research (PTK). According to Wardani (2002) PTK is the research conducted by the teacher in his own class through self-reflection, with the aim of improving performance as a teacher, thus increasing student learning outcomes [13]. The key point in PTK is the action to be repeated in order to achieve the desired results. Actions by persons directly involved in the revised field, in which case the teachers ask for help from others in planning and implementing such improvements. Teachers can collaborate with other teachers or principals to improve the quality of student learning outcomes, resulting from the PTK to produce an effective learning model. Class actions according to Arikunto, et al (2006) is a scrutiny of the learning activities in the form of an action that deliberately raised and occur in a class together [4].

There are four stages to be passed in this class action research, including planning, implementation, observation and reflection [4]. Figure 1 describes the model cycle of classroom action research conducted by researchers.

The research is conducted in two cycles, the first cycle consists of 3 sessions and one daily test, the second cycle consists of 3 sessions and one times daily tests. Researchers will conduct five phases, early reflection, planning, action, observation and reflection. Data collection techniques used in this study, among others: the observation techniques and test engineering.

Since this research is a classroom action research, the data analysis technique used by the researcher is descriptive analysis. Descriptive analysis aims to describe the data activities of teachers and students during learning and data completeness of learning outcomes in accordance with the KKM set. Following is technical data analysis used:

1. Analysis of data on the activities of students and teachers
   Data on the activities of teachers and students were qualitatively analyzed in order to see the conformity between action analysis planning and implementation is based on the observation sheet during the implementation of the action.

2. Complete analysis of KKM
   Data on the achievement of KKM in the subject matter of the buffer solution and the hydrolysis of salt based on individual student learning outcomes obtained from the daily tests 1 and 2. Score of daily test students for each indicator in the basic competencies calculated using the formula:

   \[ N = \frac{\text{the number of scores obtained by the students}}{\text{maximum score}} \times 100\% \]  \hspace{1cm} (1)

   Where \( N \) = Value obtained by the students
   The student is said have reached KKM when the student reaches a score of \( \geq 75 \).

3. Analysis of measures success
   Analysis of student success is done by comparing the score of learning outcomes with KKM chemistry established by school. Improved learning outcomes can be seen from the number of students on the basic score, daily test 1 and daily test 2. To know the success of the action can be seen from the frequency distribution table that is: by comparing the value of the base score with the value of students after the act. The action is said to succeed if the frequency of students who reach kkm from daily test 1 to daily test 2 fixed or increased. Conversely if the frequency decreased said action has not succeeded.

4. Results and Discussion

4.1. Result

From the results of research and discussion, found that the frequency of students' achievement before action KKM is 14 students from 33 students, whereas after the action on the first cycle is 19 students in the second cycle is 27 students. It showed that KKM frequency increased student achievement after action. With thus be concluded that the implementation of STAD cooperative learning model can improve student learning outcomes XI IPA 1 SMAN 1 Bangkinang City in 2015-
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2016 school year, especially on the subject of the buffer solution and salt hydrolysis. The success of this model increased from 59.98% to 81.81%.

Increased student learning outcomes can be seen by comparing the number of students who reached the KKM before the action and after the action. The success of the action can be seen in the Table 1.

Table 1: List Distribution Frequency Values Learning Outcomes

<table>
<thead>
<tr>
<th>Interval</th>
<th>Score Basic</th>
<th>UH I</th>
<th>UH II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Students</td>
<td>Number of Students</td>
<td>Number of Students</td>
</tr>
<tr>
<td>30 – 38</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>39 – 47</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>48 - 56</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>57 - 65</td>
<td>6</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>66 - 74</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>75 - 83</td>
<td>9</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>84 - 92</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>93 - 100</td>
<td>4</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

Based on Table 1, the frequency of low-value students at 30-38 intervals is absent, whereas at intervals 48-56 decreases from UH I to UH II. Although at the high intervals of 93 to 100 there is a decrease in the number of students but at intervals 75-83 an increase. As Suyanto (1997) points out, if the value of students' learning outcomes after action is better than before the action then it can be said that the action succeeds, if the action succeeds then the student learning outcomes increase [12]. In this study the score of student learning outcomes after the action is better from before the action, it can be said successful action, and if the action is successful then the student learning outcomes increase. So it can be concluded that the application of STAD type cooperative learning can improve student learning outcomes.

4.2. Discussion

The research data showed that the number of students who reached KKM in the first cycle more than the number of students who reached KKM before action. Thus the number of students reaching the KKM in the second cycle more than students who achieve KKM in the first cycle. This shows that the STAD cooperative learning can improve student learning outcomes XI IPA 1 SMAN 1 Bangkinang City in the academic year 2015 to 2016 on the subject of buffer solution and salt hydrolysis.

Based on the observations of researchers on the performance of the group is still a lot that needs to be addressed, especially in the first and second meetings, among others:
1. Students still can apply the same work in a group.
2. There is still a serious lack of students working with the program.
3. If you get in trouble more often ask students directly with the teacher of the discussion with a friend one kelompok. Sementara in STAD cooperative learning expected in the learning process is the student is able to cooperate with a group of their friends.
4. The use of time is less effective, because students do not understand the technical learning. This shows that there must be a special meeting explaining the cooperative skills that must be owned and implemented in the learning process, so expect a learning activity is effective at the first meeting.

Another factor that is also the cause of the above obstacles is because the teacher is not accustomed to using STAD type cooperative learning model, besides that students still can not apply the cooperation in the group, so the time used less effective. But in the third meeting to six aspects of discussion results increased, this is because students are getting used to the cooperative learning model. Given the motivation that teachers always provide students understanding of the stages of implementation STAD type cooperative learning model is increasing even they are more excited in learning. In the second cycle students start enthusiastic with the group. This can be seen in the
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learning of the results of observer tests and student test results on the second cycle, the first cycle of students mastery of only 19 people whereas in the second cycle of completed students increased to 27 people. From the previous writer's experience when viewed from the learning material, the material is more elusive than the hydrolysis of the buffer solution. But after tried to apply cooperative learning type STAD was generally the value of students on salt hydrolysis material increased when compared to the test results on the material of buffer solution. The results of the study support the action hypothesis.

5. Conclusion

Based on the results of research and discussion, it was found that the frequency of achievement KKM students before action as many as 14 students from 33 students is going after the action on the first cycle as many as 19 students and on the second cycle as many as 27 students. This shows that the frequency of achievement KKM students increased after the action.

Thus, it can be concluded that the implementation of STAD cooperative learning model can improve student learning outcomes in class XI IPA SMAN 1 Bangkinang City in academic year 2015-2016, especially on the subject of the buffer solution and salt hydrolysis. The success of this model increased from 59.98% to 81.81%.

Based on the results, the authors propose some suggestions:
1. STAD cooperative learning model can be used as an alternative chemistry learning, especially learning to improve student learning outcomes chemistry.
2. STAD cooperative learning is the simplest type. Using other types is suggested.
3. To increase student motivation in learning can be developed tools which awards more interesting.
4. Teachers should familiarize students learn to think creatively, dared to ideas and always concerned about them and believe that every person has strengths and weaknesses that need to co-exist in cooperative activities.

References