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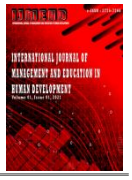

# Jigsaw Type Cooperative Learning Model to Improve Learning Outcomes of Natural Science (Study at SD Negeri 2 Bokori)

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**ABSTRACT**

*This research was motivated by the low scores of science subjects at SD Negeri 2 Bokori which were caused by the science learning process that had been carried out so far, which always applied traditional learning patterns. This type of research is classroom action research, as a research procedure that produces descriptive data in the form of written or spoken words from observable evaluation results. The population of this study were 28 students of Class VI SD Negeri 2 Bokori.*

*The results obtained indicated that the application of the jigsaw cooperative learning model can improve the learning outcomes of Class VI students at SD Negeri 2 Bokori for science subjects, the achievement of performance indicators has been achieved where the classical average in cycle I reaches 73.23 and the percentage of classical completeness 77.93, while in cycle II it has increased where the classical average has reached 78.57 and the percentage of completeness in classical has reached 82.14. Based on this, the performance indicator in this study is the classical average of 75 and the classical success percentage is 80%.*

**Keywords:** *Jigsaw Type, Cooperative Learning Model, Learning Outcomes*

## I. INTRODUCTION

Improving the quality of human resources always strives for reform, especially in the world of education. This is intended so that the development developed in this country can run according to the targets expected in the educational planner. In line with that, many changes have occurred in the world of education, especially in curriculum development, learning strategies, media, forms of evaluation to the development of the learning process in the classroom.

School is the main unit in the management of the educational process, in that school the teaching and learning process occurs, namely the maturation process that involves students and teachers as the main components in developing children's potential. Besides that, there are many supporting components that play a role in the progress of the children's learning process at school.

Towards the end of the first five-year long-term development period, we are becoming increasingly aware of our shortcomings concerning development in the field of education. One of the shortcomings lies in the core of the educational activity itself, namely the learning process. According to Conny (1985: 14), there are still many teachers in the learning process that treat students a way of learning known as sitting, listening, taking notes and memorizing (DDCH). Knowledge capital for students is absolutely necessary to be able to take part in the knowledge age. Mastery of knowledge requires high reasoning skills, interest and motivation to learn, so that all three really need to be developed in the learning process at school.

The results of discussions between prospective researchers and several science teachers at SD Negeri 2 Bokori, obtained information that in the science learning process that has been carried out so far, it has always been implementing traditional learning patterns so that student learning outcomes are very low. In addition, students' learning interest and motivation are still low. The delivery system is mostly dominated by teachers whose teaching styles tend to be authoritarian and instructive, and the communication process is one-way.

So far, learning the composition and function of plant parts in Class VI SD Negeri 2 Bokori has been implementing a process skills approach, but in its implementation, maximum results have not been obtained. This is evident from the results of daily tests in the last two years, about 50% - 60% of students have not reached a score of 65 as the standard of learning completeness set by the school at 75%.

One of the factors that is suspected to be the cause is that the learning system carried out by the teacher is less varied, which is merely learning carried out by the lecture method without paying attention to the learning



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method which is more precise so that the results are less optimal, the method is monotonous. In this case Syaiful (1996: 27) states that the method is an external stimulant that can arouse one's learning.

To overcome these problems, as a science teacher, they should look for appropriate learning innovations. The basic aim that researchers are interested in studying it in a study with the title: Jigsaw Type Cooperative Learning Model in Natural Science Learning Subjects Arrangement and Function of Plant Parts Can Improve Learning Outcomes of Class VI Students of SD Negeri 2 Bokori.

## II. LITERATURE REVIEW

### 2.1 Understanding Learning

Activity learn in school is the core of the educational process at school. Learning is the main tool for students in achieving learning goals as an element of the educational process in schools. Meanwhile, teaching according to Hadith (2006: 59) is the main tool for teachers as educators and teachers in achieving learning objectives as a process of education in the classroom. Further said by Sutikno (2005: 135) that learning is a necessity in human life, just as important as work, and friends, and a way of adaptation of man's ultimate, if we do not learn it cannot survive, and we would certainly alone won't work either. Learning is complex and includes many aspects of life. All human activities have a learning dimension. Learning is carried out continuously, informally, in different *settings*, within the family, in free time, through community activities, and every activity that is practical in nature. Then Hamalik (2008: 29) says that learning is not a goal but a process to achieve goals. So, are the steps or procedures that are taken.

Slameto (1988: 2) argues that: learning is a business process carried out by individuals to obtain a whole new change in behavior, as a result of individual experience itself in individual interactions with their environment. Further said by Moeslichatoen (1989: 1) that learning can be defined as a process that makes the learning process occur and change itself results from efforts in the learning process.

### 2.2 Definition of Teaching

Teaching is essentially an attempt to create environmental conditions or systems that support and allow the learning process to take place (Sardiman, 1990: 47). If activity learning is Activity undertaken by students, while Activity teaching undertaken by teachers as teachers and educators in the classroom.

Teaching can also be interpreted as an activity carried out by the teacher to transfer knowledge to students. Teaching also means imparting knowledge to students. The definition of learning according to this definition means that the student's learning objective is simply to gain or master knowledge. As a consequence, this kind of understanding can create a tendency for children to become passive, because they only accept information or knowledge provided by the teacher. Because of that the teaching is teacher-centered, so the teacher holds a key position in the teaching and learning process in the classroom. The teacher conveys knowledge, so that students know about the knowledge conveyed by the teacher. This kind of teaching is called intellectualistic teaching.

### 2.3 Concept of Cooperative if e Learning

The term *Cooperate VIII e learning* in Indonesian language discourse is known as cooperative learning. This term means more than just traditional group study which forms work groups in a positive environment and eliminates individual competition in groups for academic achievement. The concept of *cooperative learning* is not a new concept but has been known since the first century AD, when ancient Greek philosophers suggested that in order for a person to learn, he must have a "partner" to learn. This implies that someone in carrying out learning activities needs friends or study partners.

*Cooperative learning* can also be interpreted as a motive of cooperation, where each individual faced with the choice that must be followed if prefer cooperation, competence, or individualists. The use of the *cooperative learning* model according to Stahl (1994: 25) is an approach to the learning process that requires participation and cooperation in groups. *Cooperative learning* can improve student learning towards a better, help attitude in some social behavior.

### 2.4 Characteristics and Principles of Cooperative Learning

Characteristics are behaviors that appear and become traits or characters of cooperative learning activities. Slavin said that cooperative learning has a number of certain characteristics that differentiate it from other learning and these characteristics can be described as follows:

a. *Refers to group success: Group* success is the group's victory in competition in a learning activity (as is the type of Jigsaw). Group success is achieved jointly by all group members.
b. *Emphasize the role of members:* Each member in the group has a clear task and function, meaning that group members act as a pusher, peace maker, mover, decision maker, or formulator.
c. *Relying on sources or materials:* resources or materials to be studied are divided equally among each group member. The intended learning material is in the form of reading material or student worksheets (LKS) relating to the subject matter to be taught.
d. *Emphasize interaction:* Each member of the group interacts face-to-face in a focused group and calls friends by name.
e. *Prioritizing individual responsibility:* Group victory depends on individual learning outcomes on understanding learning material. Each member of the group guides each other to learning materials that have not been understood. After all group members understand the learning material, group members are ready to carry out the test (quiz) at the end of each meeting.



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f. *Creating opportunities for mutual victory:* Each student contributes to his or her group of learning outcomes. This can be done by each member of the group trying to get the best score.
g. *Prioritizing personal relationships:* All group members need to get along with each other and help each other in group study,
h. *Emphasizes shared leadership:* Each student has the right to speak and have their own assignments. The teacher acts as a guide (Tutor) at every time the learning takes place, and
i. *Emphasize group assessment or rewards: Group* assessments are given to joint efforts with group members and group awards are usually given when a group wins or wins a game between groups.

### 2.5 Understanding Jigsaw

The word Jigsaw is taken from the English language as a noun which means pieces of mosaic / pattern. So, Jigsaw is a learning pattern or model where students will be divided into several groups with heterogeneous characteristics both in terms of academic ability or social status, ethnicity. Academic materials will be presented to students in the form of tests, and each student will learn one part of the academic material as their responsibility.

The jigsaw concept has been developed and tested by Elliot Arronson and friends at the University of Texas. Then adapted by Slavin and friends at John Hopkins university in Muslimin Ibrahim, et al. (2000: 11) This method is the right method and has been tested in learning so it is also applied by teachers in schools.

The Jigsaw concept is unique in practice compared to the traditional group discussion method. In Jigsaw there is group learning and helping each other between teams or between groups so that learning objectives can be achieved. This can foster student activity in learning. Cooperation and attitude, responsibility in completing tasks. This uniqueness is what makes this Jigsaw model / pattern suitable for use as an alternative method of learning.

### 2.6 Relevant Research Results

Various studies on cooperative learning models with relevant jigsaw techniques have been carried out, including:

Aswati (2002: 14) Improving the quality of learning using the jigsaw technique at SMP Negeri 9 Kendari. This study provides the results that the improvement of the learning process implemented through the jigsaw technique can turn an inactive learning atmosphere into an active one. Sukisno (1998) in his research suggests that the cooperative learning model is a model that can optimize student learning outcomes. The learning structure is organized in such a way that is cooperative and the active role of students in learning is the dominant activity and teaching and learning activities, and the evaluation of learning emphasizes the process rather than the results. The application of the cooperative model also requires students and teachers to interact with each other, cooperate in solving problems in learning.

I Wayan Lasmawan (1997) in the results of his research concluded that learning cooperative learning type jigsaw has a high enough effectiveness, can increase student achievement in relation to mastery of material, attitudes, social skills, create a climate and an atmosphere of active student teaching and learning. interactive, increase excitement, motivation, mastery of material, and familiarity between students and students and students and teachers (research *results in one of the elementary schools in Bali)*

Milwan (2004: 19) found that the achievement of student learning outcomes in the jigsaw cooperative learning group showed an increase in learning outcomes. The increase in learning outcomes is caused by the seriousness of students in participating in learning. This seriousness is also supported by relevant learning models, so that they are very enthusiastic about participating in learning. In learning the Jigsaw Technique at Tanjung Toronipa there will be social interactions that can build students' cognitive because learning occurs when students work to handle given tasks, students work together in groups, discuss and exchange ideas so that it makes it easier for students to understand the concepts being taught.

## III. RESEARCH METHODS

### 3.1 Time and Place of Research

The research was conducted on Class VI SDN 2 Bokori, odd semester in learning 20 12 /20 13. This research was conducted in collaboration with 2 teachers. The implementation of this research activity was carried out for 30 days. The number of students being the target of this study was 28 people consisting of 11 male students and 17 female students with almost the same level of academic ability as well as their social and economic conditions.

### 3.2 Factors that are examined

Some of the factors that were targeted or wanted to be examined in this study were:

a. Student Factors

There are two factors that are the target of this study towards students, namely: (1) The level of understanding of the concepts of sociology and personality formation (2). Students' ability in implementing existing learning strategies.

b. Teacher Factor

The target expected by the teacher in this study is the readiness of the subject matter, using learning strategies that are oriented towards cooperative learning of the jigsaw type and organizing students in the learning process. This can be illustrated by the teacher's ability to carry out the core scenario and the closing stage.



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### 3.3 Research procedure

1. Research Overview

According to the title of this research which uses the type of jigsaw cooperative learning model, the scenario developed and implemented in learning as a research tool by the researcher is to convey a scenario or outline of the learning material to be explored, the way is:

a. Students are divided into several groups with 4 members of the heterogeneous study group.
b. The teacher provides student activity sheets as problems to be discussed with each group (original group)
c. The teacher forms a group of experts as a group that will discuss each question.
d. After the expert group concludes the results of the discussion, then the expert team members will return to the original group and teach what they have learned and discussed in the expert group to be passed on to their own group of friends.\
e. Sources and discourses as well as problems are made based on indicators that are expected to be achieved in this lesson.
   - Making learning media involves students and teachers.
   - Learning scenarios are prepared in RPP which are adjusted to Competency Standards and Basic Competencies.
   - To determine the success of this model, a learning evaluation is conducted in the form of questions (multiple choice and essay) at each meeting.

2. Research Action Plan

Guidelines / procedures for conducting this research refer to the details of the implementation of research actions proposed by Ridwan. S (in Anonymous, 2004) states that the details of classroom action research procedures consist of:

a. Action Preparation

This stage is carried out by planning in the form of determining the class of research subjects, preparing a learning plan, determining the focus of observations and aspects being observed, determining the type of data and how to collect it, determining the observer, observation aids, observation guidelines, how to carry out observations, determining how to implement reflection and reflecting actors and determine the criteria for success in problem solving efforts.

b. Implementation of Actions

The implementation of the actions in this study was carried out through the implementation of learning in accordance with the action plan. The implementation of the action was carried out in several research cycles until the achievement of student success in achieving learning completeness as expected, namely the classical average was 75 and classical learning completeness was 80%.

c. Observation and Evaluation

At this stage, observations were carried out on the implementation of the action using observation sheets to determine student activeness and teacher performance in guiding students in applying the jigsaw type cooperative learning model. Observations are carried out simultaneously with the implementation of learning. Observations were made by observers, namely peers and action actors in an effort to collect quantitative data through observation sheets. Qualitative data is carried out through the implementation of evaluation in the form of a question bill which is given at the end of the lesson for each cycle.

d. Analysis and Reflection

At this stage, the researcher carried out a reflection discussion based on the results obtained in the observation and evaluation stage to see whether the activities carried out had been able to improve student learning outcomes both in product and process classically. The researcher describes the data analysis procedures that have been collected which are then processed by reducing data, simplifying data, tabulating data and summarizing data. All of these things are used in reflection material conducted by peers through simple discussions in the teacher's room in order to obtain the level of achievement of research targets as well as failures and efforts to overcome them in the implementation of the next cycle.

### 3.4 Data and Method of Collection

#### 3.4.1 Data source

The data source of this research is research personnel consisting of students and teachers.

#### 3.4.2 Type of Data

The type of data obtained in this study consisted of learning outcomes tests in the form of product learning outcomes tests and performance tests as well as observation sheets.

#### 3.4.3 Data Retrieval Method

a. Product learning outcomes data were taken by giving tests to students
b. Data about the value of the process and student activeness in learning and teacher activities during teaching and learning activities were obtained using observation sheets.

### 3.5 Performance / Success Indicators

The performance indicator / success in this action research is if the level of understanding of the concept of students which is the result of student learning in learning activities on the material for the composition and function of plant parts in Class VI SD Negeri 2 Bokori reaches 80% classical completeness and an average value of 75.



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## IV. FINDINGS AND CONCLUSIONS

### A. Research Results

The data analysis used in this research is descriptive data processing, namely the mean and the percentage. The type of data that is decomposed is the achievement of learning effectiveness using the Jigsaw-type cooperative learning model (processing the results of observations by collaborative colleagues and students) and student learning outcomes in the form of evaluation data in each cycle.

- **Application of the Jigsaw Type Cooperative Learning Model on the Subject of the Arrangement and Function of Plant Parts.**

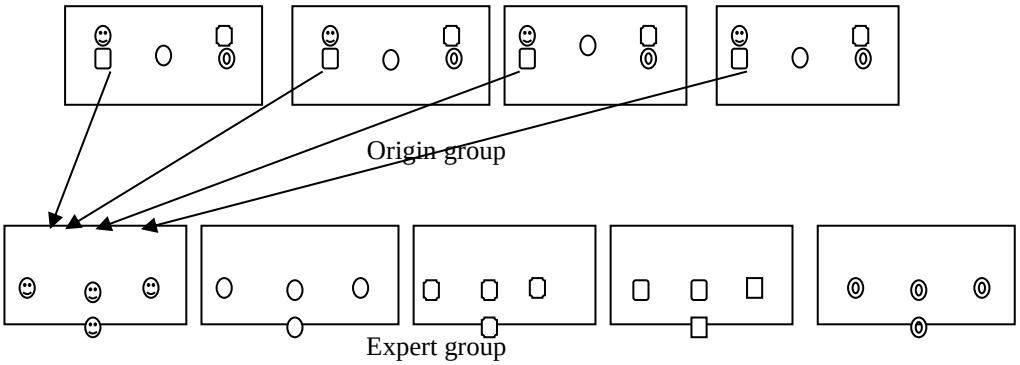
The thing that is done by researchers in teaching the subject materials of Sociology and the formation of student personality by using the cooperative jigsaw type is to first compile a program, namely various teaching preparations or what are called learning tools ranging from annual programs, quarterly chess programs, Study Material Analysis (AMP), Plans Learning (RP), Unit Lessons (SP), worksheets and teacher teaching materials / materials.

To carry out the preparations for this type of jigsaw cooperative learning the researcher conveyed the procedures for group division, dividing students into cooperative groups, formulating aspects or problems to be investigated, determining the schedule of activities. The material presented in this study is designed in such a way as to suit the form of learning organized in groups.

**a. Group activity stage**

The steps for this group activity are as follows

a. Students are divided into 5 members of a heterogeneous study group and this group is called the home group.
b. Asking students things related to the material to be taught.
c. Reveal a thing that can arouse student learning motivation
d. Each person in the team was given different material which contained several questions about sociology and personality formation materials for each group (home group).
e. Each person in the home group forms a group leader and shares the material to be discussed with the expert group.
f. Members of different teams who have studied the same section / subsection meet in a new group (expert group) to discuss the problems they have shared.
g. After completing the discussion, some of the expert team each member returns to the original group or meets and then discusses homogeneous problems and takes turns teaching their teammates about the sub-chapters they master and each other member listens intently, other students provide input on the opinion of the expert team in the group in the form of additional ideas, ideas, opinions. And so on until each team of experts in the group gets back their part of the job.
h. A member of the expert team returns to the original group and teaches what has been learned and discussed in the expert group to be passed on to their own group of friends. This can be seen in the following image:




Description:

= Root Expert
= Trunks Expert
= Leaf Expert
= Flower Expert
= Example expert

i. Each team of experts presented the results of the discussion.
j. Teachers with students discuss in making conclusions
k. The teacher conducts a learning evaluation
l. The teacher provides homework assignments and learning evaluations.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**b. Learning evaluation stage**

After the subject matter of Sociology and the formation of the personality of the Sociology subject is discussed in groups with the Jigsaw type, a learning evaluation is carried out. The evaluation in question is an activity to test the success or weakness of the learning process after students join the teaching program that we provide.

In this learning evaluation, the teacher prepares a quiz or question to be answered by students. Each student's answer or study group will be given a score by the teacher. This drilling takes the form of assessing each individual in the group. The quizzes or questions used are in the form of essays and objective choices.

**c. The findings about the good and the weaknesses in the application of the jigsaw cooperative learning model**

The learning model is a technique or method used by a teacher in designing cooperative learning groups in accordance with the subject matter in each subject. Not all learning models are suitable for all subjects, but all learning models can be carried out by a teacher in each subject, but it should be noted that each learning model has advantages and disadvantages in the learning process. The jigsaw type has its own uniqueness, namely having two group names, namely the original group and the expert group. The results of this study indicate that learning using the jigsaw cooperative type has advantages, namely that in the learning process of sociology and personality formation, students have seriousness in participating in learning, so they are very enthusiastic in participating in learning, this type of jigsaw cooperative allows students to be able to interact socially. which can build student cognitive because learning occurs when students work to handle given assignments, students work together in groups, discuss and exchange ideas so that it makes it easier for students to understand the concepts being taught. The drawback of this type of jigsaw is that in the learning process the students are a little noisy in looking for their groups, but this noise does not interfere with the process, so here the teacher is required to be able to supervise in a fun way.

- **Application of the Jigsaw Type Cooperative Learning Model Can Improve Learning Outcomes on the Subject of the Arrangement and Function of Plant Parts.**

This chapter describes the findings of the application of the jigsaw cooperative model regarding teaching and learning process activities, the results of observations made by collaborative colleagues on student activities in making learning effective in cycles 1 and II, in addition to student activities, collaborative colleagues also make observations of the teacher's ability to make it effective. learning through the implementation of cooperative jigsaw using Linkert scale, the results of achieving Objective product on evaluation of learning activities.

**a. Implementation of Cycle I p there is a Teaching and Learning Process Activities**

The implementation of cycle I is carried out in two meetings for the use of a Teaching Program Plan (RPP) which concerns the root and stem material. Cycle I was held on Monday, 13 August 2012 and Monday, 20 August 2012. Prior to the implementation of cycle, I, preliminary activities were carried out in the form of introducing the jigsaw cooperative learning model technique and giving group assignments that would be used during the next lesson in the form of social values and norms. The results of observations made by collaborative colleagues on student activities in making learning effective in cycle 1 can be seen in the following table.

Table 1. Percentage of Student Activities in Effectiveness of Type Techniques jigsaw in Cycle I.

| No. | Observational Aspects | Percentage (%) |
|---|---|---|
| 1. | Students' understanding of the subject matter | 81.25 |
| 2. | Student cooperation in groups | 87.50 |
| 3. | Asking questions (at the percentage or to the teacher) | 81.25 |
| 4. | Understanding of learning scenarios | 75.00 |
| 5. | Ability to respond to rebuttals / questions | 75.00 |
| 6. | Problem solving skills | 87.50 |
| 7. | A pleasant learning atmosphere for students | 87.50 |

Based on table 1, it can be seen that student activities in learning have reached 75% - 87.50%. However, the understanding of the learning scenario and the students' ability to respond to rebuttals / questions was not maximal, reaching only 75%.

S Elain student activities, peer collaboration also made observations of a teacher's ability to streamline the learning through the implementation of cooperative jigsaw using Linkert scale. The results of these observations are shown in the following table:



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Table 2. Average Percentage Capability Teachers in Making Teknik Learning cooperative jigsaw in Cycle I.

| No. | Aspects Observed | Data analysis | |
|---|---|---|---|
| | | Average | percentage |
| **A. Introduction** | | | |
| 1 | Prepares students to learn | 3.50 | 87.50 |
| 2 | Motivate students to take lessons | 3.50 | 87.50 |
| 3 | Presenting a problem to students related to the subject matter discussed | 3.50 | 87.50 |
| 4 | Deliver basic competencies and learning indicators | 3.50 | 87.5 |
| | **amount** | **3.50** | **87.50** |
| **B. Core activities** | | | |
| 1 | Organizing students into study groups | 4.00 | 100 |
| 2 | Guiding students to conduct discussions / observations | 3.50 | 87.5 |
| 3 | Provide opportunities for students to ask questions. | 3.00 | 75.00 |
| 4 | Provide questions about basic competencies and indicators of learning equally. | 3.25 | 81.25 |
| | **amount** | **3.45** | **85.94** |
| **C. Closing** | | | |
| 1 | Guiding students in summarizing the lesson | 3.00 | 75.00 |
| 2 | Give a conclusion | 2.50 | 62.50 |
| 3 | Reflection | 3.25 | 81.25 |
| 4 | Closing lessons | 3.50 | 87.50 |
| | **amount** | **3.06** | **76.56** |
| **D. Classroom atmosphere** | | | |
| 1 | Enthusiastic students | 3.50 | 87.50 |
| 2 | The teacher is enthusiastic | 3.75 | 93.75 |
| 3 | Manage the class well | 3.25 | 81.25 |
| 4 | Allocation appropriate time | 2.00 | 50.00 |
| 5 | KBM According to the scenario in the RPP | 3.00 | 75.00 |
| | **amount** | **3.10** | **77.50** |

Based on table 2, it can be seen that the ability in cycle I in carrying out the type of jigsaw cooperative learning in each learning activity is still not optimal. It can be seen that the percentage achievement of each aspect of the activity has not yet reached the range of 90 to 100%.

**1) Student Learning Outcomes**

Measurement of the success rate of students in the teaching and learning process which is the result of student learning is carried out by giving evaluation at each meeting then the average is taken and the determination of the percentage of success in two forms of questions, namely multiple choice and essay tests and the minimum completeness standard is 65. For student learning outcomes class VI totaling 28 people in the first cycle for the competence can be seen in the following table.

Table 3. Data on the Achievement of Product Goals in Evaluation Activities on Root and Stem Material

| No. | Indicator | Classical Learning Outcomes | | | Total Completeness | |
|---|---|---|---|---|---|---|
| | | Amount of Value | Average | Percentage | Completed | Not complete |
| 1.<br>2.<br>3.<br>4. | State the Root Parts in full<br>State the types of roots and their classification<br>State the parts of the stem in full.<br>State the types of stems and their classification | 2050.5 | **7323** | 73.23 | 22 students | 6 students |
| | The percentage of classical completeness | | | | **78.57%** | 21.44% |

Achievement of learning outcomes in cycle I as shown in the table above, shows that classically the average learning outcomes of Class VI students reached 73.23 and classical learning completeness reached 78.57%. This still does not meet the expected performance indicators.

**2) Results of Cycle I Reflection**

The strengths that are found during the researcher's actions are applied and developed as well as the weaknesses that emerge by the researcher
fixed at the next meeting. Exposure to reflection results in cycle I can be described as follows.

a). Advantages

1). The effectiveness and participation of students during learning has progressed when compared to before the CAR action.
2). Students show joy and seriousness during learning, especially in the enthusiasm for learning which has an impact on the results of the evaluation given (the classical average at meeting 1 was only 68.07% while at meeting 2 it reached 75.54%).
3). Students show discipline to do assignments both individually in learning and in groups (with the admission of students, there are groups that voluntarily try to find the source of answers to assignments given to each group).
4). Researchers in preparing PTK facilities are quite good, which can be seen from the learning facilities displayed which are adjusted to existing conditions and abilities.
5). Researchers have been able to operate learning according to the scenario


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6). Researchers have tried to improve their performance from the first meeting to the second meeting.
7). The material discussed is based on students' previous knowledge through observation and group assignments.
8). Researchers have provided meaningful motivation for students in the form of giving rewards to the best performing groups.

b). Weaknesses and Corrective Action Plans

Weakness and plan corrective actions that have been researchers carried out during the first cycle can be described in the following table. Table 4. Implementation of Cycle I Learning Actions

| Ex e Mahan at the Meeting 1 | Corrective Actions and Weaknesses at Meeting 2 | Action Plan in Cycle II |
|---|---|---|
| Researchers are a little stiff (less relaxed) in carrying out learning when observed by collaborative colleagues | Researchers try to approach observers through discussions outside the PBM | Before carrying out the implementation of all learning needs, be carefully prepared. |
| Researchers do not expose k an indicator of successful learning | Researchers mention the indicators of learning success at the beginning of the meeting | Announce and emphasize the group that did the best group assignment and the student who scored the best in the evaluation and give simple and fun gifts. |
| At the first meeting the researcher did not introduce the collaborators who were present in the class, which initially caused confusion to the students | Introducing collaborative colleagues before the implementation of PBM, but it can be seen that students still feel like they are being watched so that sometimes they are less relaxed in learning. | Divide students so that all get a percentage turn |
| The activeness of students in solving problems in the group has not been evenly distributed so that there are students who hope that their partners will solve existing problems. | Remind students that the aspect of collaboration in groups is the key to success in achieving the truth and the right time to solve problems, but there are still students who look indifferent. | Divide group problems into individual students so that students can be active |
| The use of time has not been well organized so that the available time has not been able to reach the learning scenario created so that several stages of learning are carried out as if they are in a hurry | Breaking down the time for each stage of learning, but learning is not optimal. | Pen e Liti should reconsider the breadth of activities and time allocation to be used. |
| The RPP has no details on the time | Includes detailed time at the time of preparation of the next RPP, but the available allocations were not consistent at the time of implementation. | Match the time allocation for the PBM activity stages on the right side of the RPP |
| The assignments given to students for the next meeting were less clear due to time constraints. | Prepare manuscripts of assignments given to each group to be copied and worked on. | Prepare worksheets for each person so that at least one student can handle a different part of the assignment. |
| At the time of the percentage, self and group identities are not clear. | It is advisable to introduce yourself and the group at the percentage. | Prepare an observation assignment sheet for the next meeting. |
| At the percentage, group members appeared passive in responding to questions / rebuttals. | Provide an opportunity to respond to rebuttals / questions to group members who do not have a percentage. | Provide ID and serial number to each member of the group to facilitate the assessment of observations and assessments. |
| The time available for evaluation is not proportional to the number and level of difficulty of the questions. | Prepare evaluation sheets and answer sheets for students that are tailored to the learning objectives and the time allocation available | Make an evaluation sheet considering the time available. |
| The researcher forgot to end the lesson | End the lesson by saying hello<br>Guidance is carried out from one group to another | Providing general guidance and then mentoring from one group to another |
| Guidance in solving problems in the group is not evenly distributed. | Giving questions based on groups with even frequency. | |
| The teacher asks questions regarding the basic competencies and indicators that are not evenly distributed | Providing the opportunity to ask students based on group representatives. | |
| The opportunities given to students to ask questions were not evenly distributed in each group. | Guidance summarizes the lessons carried out from one group to another | |
| Not all groups, researchers provide guidance in summarizing learning. | | |



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**b. Implementation of Cycle II in Teaching and Learning Activities**

The implementation of learning activities in cycle II is basically the same as the activities in cycle I, only the basis for the implementation is based on the results of reflection in cycle I. The implementation of cycle II is carried out on Monday, 27 August 20 12 and 3 September 20 12 on the material of Leaves and Flowers. Before the implementation of cycle II, at the last meeting of cycle I students were given assignments related to learning in the cycle in the form of identification of roots and stems obtained from various materials in science books about root and stem images. These assignments are carried out in groups

The results of observations made by collaborative colleagues on student activities in making learning effective in cycle II can be seen in the following table.

Table 5. Percentage of Student Activities in Making Learning Effective cooperative jigsaw type in Cycle II.

| No. | Observational Aspects | Percentage (%) |
|---|---|---|
| 1. | Students' understanding of the subject matter | 93.75 |
| 2. | Student cooperation in groups | 100 |
| 3. | Asking questions (at the percentage or to the teacher) | 93.75 |
| 4. | Understanding of learning scenarios | 100 |
| 5. | Ability to respond to rebuttals / questions | 75.00 |
| 6. | Problem solving skills | 93.75 |
| 7. | A pleasant learning atmosphere for students | 100 |

Observations from any aspect of the students in grade IV in learning the use of cooperative jigsaw seen in Table 6, there are up to 100%, namely the cooperation of students in the group, understanding learning scenarios and a fun learning environment on students. However, the ability to respond to rebuttals / questions only reached 75%.

Observations of the teacher's ability to make learning effective through the cooperative application of the jigsaw type in cycle II using the Likert scale, can be seen in the following table: Table 6. Average Percentage of Teachers' Ability to Effectiveness Jigsaw cooperative learning techniques in Cycle II.

| No. | Aspects Observed | Data analysis | |
|---|---|---|---|
| | | Average | percentage |
| **A. Introduction** | | | |
| 1 | Prepares students to learn | 4.00 | 100 |
| 2 | Motivate students to take lessons | 3.75 | 93.75 |
| 3 | Presenting a problem to students related to the subject matter discussed | 4.00 | 100 |
| 4 | Deliver basic competencies and learning indicators | 4.00 | 100 |
| | **amount** | 3.75 | 93.75 |
| **B. Core activities** | | | |
| 1 | Organizing students into study groups | 4.00 | 100 |
| 2 | Guiding students to conduct discussions / observations | 4.00 | 100 |
| 3 | Provide opportunities for students to ask questions. | 4.00 | 100 |
| 4 | Provide questions about basic competencies and indicators of learning equally. | 4.00 | 100 |
| | **amount** | 4.00 | 100 |
| **C. Closing** | | | |
| 1 | Guiding students in summarizing the lesson | 3.75 | 93.75 |
| 2 | Give a conclusion | 4.00 | 100 |
| 3 | Reflection | 4.00 | 100 |
| 4 | Closing lessons | 4.00 | 100 |
| | **amount** | 3.75 | 93.75 |
| **D. Classroom atmosphere** | | | |
| 1 | Enthusiastic students | 4.00 | 100 |
| 2 | The teacher is enthusiastic | 4.00 | 100 |
| 3 | Manage the class well | 3.75 | 93.75 |
| 4 | Appropriate time reaction | 4.00 | 100 |
| 5 | KBM According to the scenario in the RPP | 4.00 | 100 |
| | **amount** | 3.75 | 93.75 |

Based on table 6, it can be seen that the teacher's ability according to observations made by collaborative colleagues in preliminary activities reaches 93.75%, Core Activities are 100%, Closing Activities are 93.75% while the atmosphere developed in the classroom reaches 93.75%.

**1) Student Learning Outcomes**

Achievement of performance indicators that will be achieved through the learning outcomes of Class VI students in the implementation of the jigsaw cooperative learning technique is carried out through evaluation of student learning at each meeting. In cycle II, according to planning, there were 2 meetings where the recapitulation of the evaluation results in the form of averages and the percentage of student learning achievement are shown in the following table.



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Table 7. Data on the Achievement of Product Goals on Evaluation Activities for the material of Leaves and Flowers in cycle II.

| No | Indicator | Classical Learning Outcomes | | | Total Completeness | |
|---|---|---|---|---|---|---|
| | | Amount of Value | Average | Percentage | Completed | Not complete |
| 1.<br>2.<br>3.<br>4. | Offer each second example compound leaves and single leaf<br>State the 4 Functions of the Leaf<br>List the flower parts in full<br>Describe Pollination events properly. | 2199.5 | **78.6** | 78.6 | 23 students | 5 students |
| | The percentage of classical completeness | | | | **82.14%** | 17.86% |

The level of student learning success in cycle II is illustrated in table 7 , it can be seen that classically the percentage of completeness has reached 82.14% with an average of 7 8.6 . This has reached the specified performance indicator, namely the percentage of classical completeness of 80% with an average of 75.

**2) Reflection Results in Cycle II**

a). Advantages

Excess found during the execution of the act of learning p no second cycle is as follows:

1). Student activity during the teaching and learning process is getting better than the previous meeting.
2). Students become more creative, this can be seen from how to do group assignments, namely trying to complete assignments effectively.
3). Students become more communicative.
4). Students compete to get the best score
5). Student concentration while studying has been good
6). Students already understand very well the learning scenario that is applied.
7). Student learning outcomes have increased when compared to cycle I and performance indicators have been achieved.
8). All plans for corrective actions based on the results of reflection in cycle I have been implemented well in cycle II
9). Teacher performance in the management of learning has been good
10). Time control is fine.

b). Weakness Cycle II and Follow Up Plan

The weaknesses and follow-up plan in cycle II can be described in the following table:

Table 8. Implementation of Learning Action Cycle II

| Ex e Mahan at the Meeting 1 | Corrective Actions and Weaknesses at Meeting 2 | Follow-up Action Plan |
|---|---|---|
| The giving of prizes to superior students and the best groups based on the assessment of learning outcomes in cycle I has not been implemented | Prizes are given to the student who has the highest score (a pen) and to the group with the best performance. | Needs to be revisited alignment with indicators of learning materials and learning objectives that can me n to achieve a better target in the development of learning materials. |
| The number of problems given compared to the processing time has not been balanced. | The problems given are adjusted to the available time allocation. | |

**3). Student Responses to Learning Actions**

At the end of cycle II, the researcher gave a questionnaire to students to find out the student's response to the learning that the researcher applied. The results of student responses can be seen in the following table.

Table 9. Recapitulation of Average and Percentage of Student Responses to Learning Actions.

| No. Questionnaire | Measured Criteria | Answer Options | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Strongly agree | | Agree | | Disagree | | Strongly Disagree | |
| | | Average | % | Average | % | Average | % | Average | % |
| A. | Learning fun | 19 | 33.39 | 34 | 60.71 | 3 | 53.8 | 0 | 0 |
| B. | Understanding of Study Materials | 22 | 78.57 | 5 | 17.86 | 1 | 3.57 | 0 | 0 |
| C. | Motivation to learn | 23 | 41.07 | 33 | 58.93 | 0 | 0 | 0 | 0 |
| D. | Improve Thinking Ability | 27 | 36.99 | 34 | 46.58 | 12 | 16.49 | 0 | 0 |
| E. | Expressing Opinions | 29 | 51.79 | 27 | 48.21 | 0 | 0 | 0 | 0 |
| **Classical** | **amount** | **121** | | **143** | | **16** | | **0** | |
| | **Percentage** | | **43.21** | | **51.07** | | **5.71** | | **0** |



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Table 9, student responses y ang given to the act of learning cooperative jigsaw seen that in the classical stating the answer to the fifth aspect of the criteria measured, strongly agree reached 43.21%, 51.07% agree, disagree 5.71% and those who strongly disagree 0%

**B. Discussion**

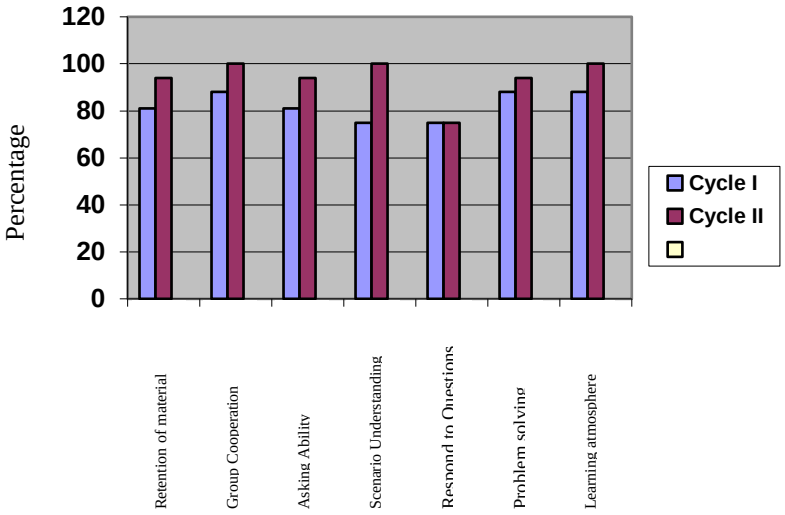
- **Teaching and Learning Process Activities**

The activities of the teaching and learning process that were observed in supporting the successful application of the type of jigsaw cooperative learning technique that had been defined in planning by the researcher included the ability to complete group assignments to support the learning process, student activities in making learning effective and teacher activities in learning. The learning results in a learning activity. For students, learning activities mean using cognitive, affective, and psychomotor abilities to digest teaching materials. In general, these learning activities include the following phases: (1) motivation, which means that students are aware of achieving their goals and act to achieve their learning goals, (2) concentration, which means that students focus their attention on teaching materials, (3) process messages, which means students processing information and taking the meaning of what is learned, (4) storing, means that students store in their memory, feelings, and motor skills, (5) digging, in the sense of using the things learned that will be used for solutions, (6) achievement, in the sense of using teaching materials for performance, and (7) feedback, in the sense that students justify learning outcomes or achievement. From the point of view of the purpose of this study, it was found that there was a priority in the content of teachings and the process of acquisition. In terms of the domains developed include the cognitive, affective, and psychomotor domains.

- **Student Activities in Making Learning Effective**

Comparison of student activities in making the jigsaw cooperative learning technique effective from cycle I and cycle II can be seen in the following graph:

Graph 1. Student Activities in Making Learning Effective Observed Student activities




Based on this table, it can be seen that there is an increase in student activities towards a better direction in making learning that takes place. This is very important because the role of students in carrying out learning scenarios is one of the main things in achieving the successful application of the jigsaw type of cooperative learning.

The role of the teacher in learning activities is relatively high which is related to the role of students in learning. According to Briggs and Telfer (in mudjiono; 1999), there are student learning motivations that can be strengthened by learning methods. Instrumental motivation, social motivation, and low achievement motivation, for example, can be conditionally conditioned so that student learning plays a role. The learning methods that affect the learning process can be determined by the teacher.

In class, we encounter many students who are sleepy or chat with their fellow students or a group of them if they are not happy with the educator's style of teaching. In this study, students significantly always showed their activeness in making learning effective, including the ability to work in groups, and asking questions. The emergence of this activity is because subject teachers always foster motivation in students. This motivation is grown through the views of Sutikno (2005; 49), namely: (1) growing motivation at the beginning of learning begins. This can be done by asking homework or members of the prerequisite knowledge, (2) when opening the lesson, try to repeat last week's lesson by asking students a few questions, (3) when delivering the subject matter try to insert humor and / or stories funny, (4) show funny caricature images, (5) try to use a learning model that can create good interactions between educators and students and between students and other students, (6) giving enthusiasm and *applause* to students after each activity .

Besides honorary teacher student activities also made observations of teachers in the learning effectiveness of cooperative jigsaw as driving lessons. Based on the analysis of s data that has been done previously seen that the researcher is always trying to make improvements so that the reflection performance through results from the first cycle to cycle II increased in both the preliminary activities, core activities and activities of the cover and the



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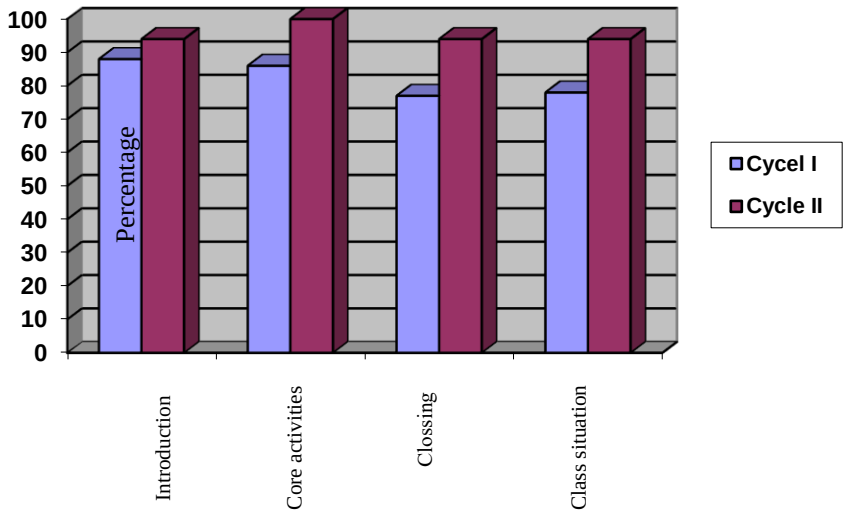
classroom atmosphere arising from learning actions undertaken. An overview of improving teacher performance from each stage of learning can be seen in the following graph.

Graph 2. Teacher Activities in Making Learning Effectively Stage in Learning Activities

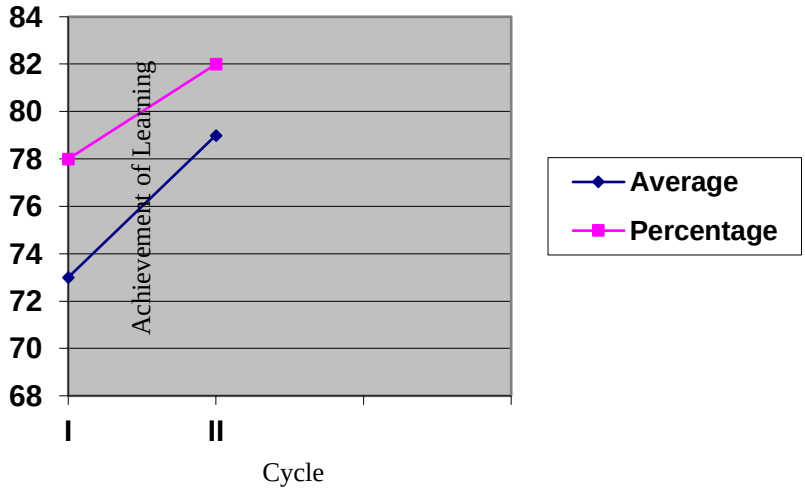



The increase that occurs, as seen in the graph above, is the result of implementing the action of the reflection carried out so that the weaknesses detected at each meeting are attempted to be implemented in the second cycle.

- **Student learning outcomes**

Measuring the level of student learning success is carried out through learning evaluations at the end of each meeting to get the basic competency learning outcomes taught, data processing is carried out by looking for the average acquisition of each student. For each activity cycle analyzed by descriptive method through analysis of learning outcomes in order to determine the number of student scores, as well as the mean and percentage of classical completeness. The results of achieving general learning outcomes from cycle I and cycle II can be seen in the following graph.

Graph 3. Student Results achievement of Class VI on Application Jigsaw type cooperative learning




The average classical in the first cycle reaches the percentage of classical completeness 73.23 and 77.93, while on the second cycle increased where the average classical has reached 78.57 and the percentage of completeness in classical has reached 82.14. Based on this, the performance indicators in this study have been achieved where it has been previously determined that the success rate according to the performance indicators is a classical average of 75 and the percentage of success in a classical manner is 80%.

The success achieved is not the carrying capacity of one activity factor but the continuity of several factors such as the ability to complete group assignments, student activities, teacher activities, learning facilities and infrastructure as well as collaboration between researchers and collaborative colleagues that goes well. This success also has the advancement of science and technology, which implies the expansion of human horizons in various fields of knowledge so that each future generation must learn more to become educated humans in accordance with the times.



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Based on the results obtained and all the obstacles and obstacles experienced by the researcher, the results of the applied reflection, discussion of problem solving and all existing situations, it can be concluded that the application of the jigsaw type cooperative learning technique has been able to improve the learning outcomes of Class VI students at SD Negeri 2 Bokori. in science subject the composition and function of plant parts.

Researchers admit that the achievement of performance indicators is expected to have reached but there are still some students who have not completed, but is based on the analysis of items in the classical has reached over 65%, so that generally indicates that the question has been able to excel at the majority of students.

- **Student Response to Learning**

The willingness and ability of students to understand and participate in demonstrating the jigsaw cooperative learning model can be seen from students individually, therefore at the end of cycle II the researcher gave a questionnaire to students to find out the student's response to the applied learning.

By using a Likert scale (adapted from Ninik Kristiani, 2007) where in this lesson, students strongly agree with 43.21%, 51.07% agree, and 5.71% disagree. In a further meeting before the implementation of learning researchers send conveyed feedback on some students who respond do not agree, and based on the results of the analysis of questionnaire data showed that the answer comes as caused by some students feel is consumed time daily in completing the task load given by the teacher through the group leader, there is a lack of willingness to understand the content of the assigned assignment, feel that learning is bound by accuracy, speed and seriousness in the learning process as if it is heavy, and some students are less able to argue and have courage in a percentage so they feel awkward.

The increase in student responses to the jigsaw cooperative learning model was caused by the seriousness of students in participating in learning. This seriousness is also supported by a relevant learning model, so that students are very enthusiastic in participating in learning on sociology material

In jigsaw cooperative learning there will be social interactions that can build students' cognitive because learning occurs in groups, discussing and exchanging ideas so that it makes it easier for students to understand the concepts being taught.

The description above is supported by the observations of other Sociology teachers and some collaborators who say that with the jigsaw cooperative learning model at SD Negeri 2 Bokori it is easier for students to understand the concept of science, because students learn together with the teacher, drawing conclusions after conducting group discussions with cooperative jigsaw. From the results of the analysis carried out, it is found that the application of the jigsaw cooperative learning model illustrates the increase in student learning outcomes. The choice of teaching model according to Sutikno (2005; 56) is an attempt by educators to adjust various goals. No single teaching model can cover all objectives. There are many types of learning models, but not all models are suitable for all materials. A good learning model is if the model can be used to achieve the desired learning objectives. Furthermore, educators must strive to use a variety of learning models in order to reduce boredom. Life will be more interesting if you live it with variety. Variations in learning activities are changes in the process of activities that aim to increase the motivation of students and reduce boredom and boredom. Choosing a teaching model is a researcher's attempt to adjust various objectives. No single teaching model can cover all objectives. There are many types of learning models, but not all models are suitable for every material. A good learning model is if the model can be used to achieve the learning objectives that students want mainly. This concurs with the results of the students processed Against r es pounds in Learning Cooperative Jigsaw mode.

## V. CONCLUSION

### A. Conclusion

During the research activities until data processing is carried out, it can be concluded that:

1. The results of research on the learning process using the jigsaw cooperative type have advantages, namely that in the learning process on the material composition and function of plant parts , students have seriousness in participating in learning, so they are very enthusiastic in participating in learning, this type of jigsaw cooperative allows students to be able to Social interaction that can build student cognitive because learning occurs when students work to handle given assignments, students work together in groups, discuss and exchange ideas so that it makes it easier for students to understand the concepts being taught.
2. The application of the type of jigsaw cooperative learning model can improve the learning outcomes of Grade VI students of SD Negeri 2 Bokori on the material of the composition and function of plant parts. Achievement of performance indicators has been achieved where the classical average in cycle I reached 73.23 and the percentage of classical completeness was 78.57 while in the second cycle it had increased where the classical average had reached 78.6 and the percentage of completeness calculary had reached 82.14. Based on this, the performance indicator in this study is the classical average of 75 and the classical success percentage is 80%.

### B. Suggestion

Referring to the conclusions above, the researcher tries to provide the following suggestions:

1. For science teachers, the application of a learning model that emphasizes student activities needs to be continuously developed. This is very important because the formation of knowledge is actively carried out by students themselves
2. Based on the results of the research, that the application of the jigsaw learning model is quite effective as a learning strategy, so it needs to be applied in science learning or for other study materials.



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3. The researcher is fully aware that the implementation of the application of this study is not yet fully optimized so that next research the study and examine issues regarding the development of the learning model jigsaw, more broadly, so that the application of this model becomes more perfect and more popularized it in the world of education, especially in Elementary School level.

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