

Efforts to Improve Learning Outcomes of Class X Science1 Students for the 2020/2021 Academic Year on Bacteria Material Using Cooperative Learning Method

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Abstract

The research aims to improve biological learning outcomes on bacterial material through cooperative learning with the jigsaw method for students of the X grade of IPA1 MAN 1 Serang in the Odd Semester of the 2020/2021 academic year. The study was conducted for six months, from July to December. The subject of the study was 32 students of the X grade of the 1st semester of Odd MAN 1 Serang. The class action research was conducted in two cycles. Each cycle consists of four stages: planning, taking action, observing, and reflecting. Data analysis used comparative descriptive analysis by comparing the initial values of class action research from the initial and final conditions. Data collection techniques using observation, documentation, testing, and non-testing techniques. Data is collected from no treatment conditions, cycles I and II results. The study's results show an increase of 8% in the average of the initial condition to cycle 1 with an average of 75 to 81. Cycle I to Cycle II increased by 13.58%, from 81 to 92. Initial to final conditions increase by 22.66% from the average value of 75 to 90. Students' learning activity and motivation increased.

Abstrak

Tujuan penelitian untuk meningkatkan hasil belajar biologi pada materi Bakteri melalui pembelajaran kooperatif dengan metode metode jigsaw bagi siswa kelas X IPA1 MAN 1 Serang pada Semester Ganjil Tahun Pelajaran 2020/2021. Penelitian selama enam bulan dari Bulan Juli – Desember. Subyek penelitian adalah 32 siswa kelas X IPA1 Semester Ganjil MAN 1 Serang. Penelitian tindakan kelas dilakukan sebanyak dua siklus. Tiap siklus terdiri empat tahapan yaitu membuat perencanaan, melakukan tindakan, mengadakan pengamatan dan melakukan refleksi. Analisis data yang dipakai analisa diskriptif komparatif dengan membandingkan nilai hasil penelitian tindakan kelas dari kondisi awal dan kondisi akhir. Teknik pengumpulan data menggunakan teknik observasi, dokumen, tes, dan non tes. Pengumpulan data diperoleh dari kondisi awal, hasil siklus I dan hasil siklus II. Hasil penelitian menunjukkan peningkatan nilai rata-rata kondisi awal ke siklus I sebesar 8% dengan rata-rata nilai 75 menjadi 81. Siklus I ke siklus II peningkatan sebesar 13,58%, dari 81 menjadi 92. Kondisi awal ke kondisi akhir peningkatan sebesar 22,66% dari nilai rata-rata 75 menjadi 92. Aktivitas dan motivasi belajar siswa meningkat.

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1. INTRODUCTION

Facts in the field show that in the Biology subject in class. This is evident from the average score of the daily test results which is still within the KKM limit, namely 75. The average class score is 75, the lowest score is 43, and the highest score is 89. Of the 32 students there are 13 students with scores below the KKM of 75 or 40. 62% have not yet completed, 19 students have completed or 59.37%. This is proof that his achievements still show that learning activity is still low, so that there can be an increase in activity, as well as an increase in researchers in their duties as educators.

The Biology learning process for class student potential, 5) using monotonous methods, because teachers tend to be dominant as the center of learning resources. As a result: There are still many students who are passive. Most students do not dare to ask questions. Student activity in learning and discussions is still low. Students in receiving knowledge become passive. In order for learning achievement to increase, it is necessary to look for methods that produce benefits in developing

logical thinking skills, critical attitudes, and students' sensitivity to learning in fun. Many methods exist, but researchers will try the jigsaw method.

The use of the jigsaw method is expected to produce students who excel and have a spirit of mutual cooperation, are responsible for their duties, loyal friends, and indirectly teachers will become more professional in their work. Learning outcomes from cognitive, affective and psychomotor abilities. Even though the main aim of learning outcomes is to improve cognitive, affective and psychomotor abilities, in the process of achieving this the methods that create a deep impression in the minds of students are not only momentary, it is necessary to create an impression during learning, for example by working together, exchanging information, respecting each other's opinions between friends, dare to accept criticism and suggestions and be ready to admit the truth is objective, not subjective then with the jigsaw method these hopes can be realized, resulting in students with character. Not a naughty student, but a resourceful student.

There are several definitions of action research. Kurt Lewin said action research is a series of steps consisting of four stages, namely planning, action, observation and reflection. Kemmis and Mc. Taggart states that action research is a form of collective self-inquiry carried out by participants in social situations to increase the rationality and justice of the social or educational practices they carry out, as well as increase their understanding of the practices and situations in which those practices are carried out. Ebbut (1991) in Hopkins (1993), action research is a systemic study of efforts to improve the implementation of educational practices by a group of teachers by carrying out actions in learning, based on their reflection on the results of these actions. Elliot (1991), action research is the study of a situation with the possibility of improving the quality of that social situation.

Classroom Action Research (CAR) is very necessary to overcome a learning process that does not produce enough value and is an enjoyable learning process. There is a gap between expectations and the reality of the exam, namely biology learning results which only reach the completion limit of 75 and the desire for learning results to increase, so it is necessary to make efforts to increase biology learning activities and results through classroom action research. With cooperative learning, the Jigsaw method in Biology subject matter in the initial condition is only 59.37% which reaches the completeness limit of 75. After trying it using cooperative learning the Jigsaw method is expected to reach 80%. Furthermore, to find out the benefits of using the Jigsaw method of cooperative learning, classroom action research is needed with the title "Efforts to Improve Biology Learning Outcomes on Bacterial Material through the Jigsaw Method of Cooperative Learning Model for Class".

The formulation of the problem based on the background is as follows: Can cooperative learning using the Jigsaw method improve Biology learning outcomes on Bacteria (Archaeobacteria and Eubacteria) material for class

2. RESEARCH METHOD

2.1 Types of Research

This type of research is Classroom Action Research (PTK). PTK can be interpreted as the process of studying learning problems in the classroom through reflection on efforts to solve these problems by carrying out various planned actions in real situations, as well as analyzing any influences from this treatment. This research was carried out in the following stages:

1. Planning Stage
 - a. Determine to start doing research.
 - b. Determine the research class, namely class X IPA 1 MAN 1 Serang. This research was conducted in two cycles. Cycle I consists of meetings 1 and 2 with one test question. Likewise, cycle II, consists of meetings 3 and 4 with one test question.
 - c. Prepare learning tools in the form of Learning Implementation Plans (RPP) and Student Worksheets (LKS).

- d. Determine the learning material that will be presented, namely the subject of efforts to improve biology learning outcomes on bacterial material through learning using the jigsaw method.
 - e. Prepare observation sheets of student activities during learning activities.
 - f. Prepare teacher activity observation sheets.
2. Implementation Stage
 - a. Carrying out learning by applying the demonstration learning method.
 - b. The activity is carried out until all Biology material has been completed.
 - c. Carry out testing at the end of each subject cycle.
 3. Observation Stage

The observation stage is one of the stages of observing the object whose problem you want to raise. Observations were carried out using observation sheets, namely collecting data found in the field, then evaluating the research results to determine the application of student and teacher concepts during the teaching and learning process.
 4. Reflection Stage

The reflection stage uses the results or data obtained at the end of the cycle for analysis which is then used as a reference for improving actions in the next cycle.

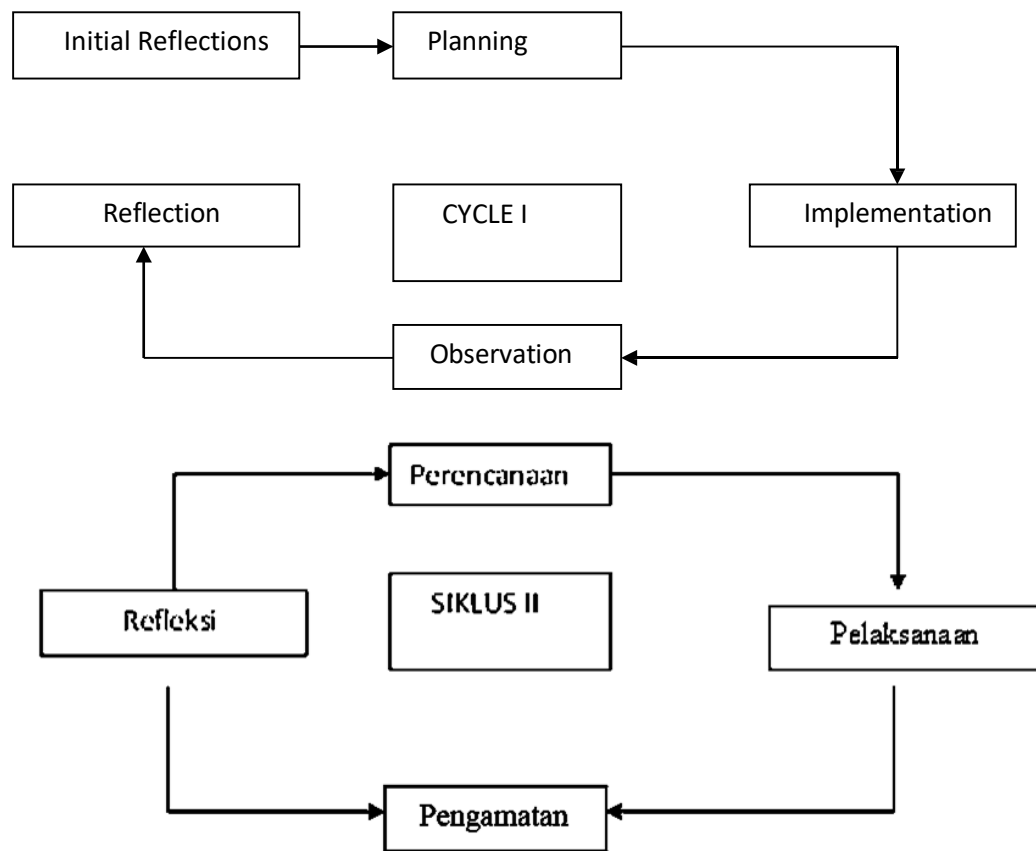


Figure 1. Class Action Research Cycle

Based on Figure 1, the research stages are explained as follows:

- a. Initial Reflection, identifying students' difficulties in understanding the concept of problems at school such as class cleanliness picket activities.
- b. Action planning

- Problems found are resolved by carrying out action planning steps, namely preparing instruments in the form of a syllabus, Learning Implementation Plan (RPP), Student Activity Sheets (LKS), teacher and student activity observation sheets, learning facilities and infrastructure, such as study guide books, and equipment that supports the learning process.
- c. Implementation of actions is carried out in the form of implementing learning programs, taking or collecting data on observation sheets and learning results using the jigsaw method.
 - d. Observation carried out together with the implementation of the action. Observations are carried out by researchers and teachers who carry out actions using observation and observation sheets.
 - e. Reflection used as a reference to improve actions in the next cycle.

Classroom Action Research or PTK (classroom action research) has a very important and strategic role in improving the quality of learning if implemented properly and correctly. Implemented well, meaning that the parties involved in PTK (teachers), try to consciously develop the ability to detect and solve problems that occur in classroom learning through meaningful actions that are calculated to solve the problem or improve the situation and the ability to carefully observe the implementation to measure the level success. Implemented correctly, meaning in accordance with PTK rules. Action research has a broader scope than PTK, because the object of action research is not only limited to inside the classroom, but can be outside the classroom, such as schools, organizations, communities and society.

The reason for taking time for class action starts in August 2020, another is because it is still an effective day and the lesson material on bacterial problems must be delivered in the odd semester, according to the teaching program schedule.

2.2 Research Place

Research location at MAN 1 Serang, Serang Regency. Class With the principal Dr. Momon Andriwinata S.Pd., M.Pd. Classroom action research was carried out as an effort to improve biology learning outcomes, especially material about bacteria

2.3 Research Subjects

The research subjects were 32 students in class Class X IPA1 is one of 11 existing classes.

2.4 Data Source

Primary sources were taken from three data, namely, initial condition learning outcome scores, cycle 1 learning outcome scores, and learning outcome scores obtained from cycle II of science class 1 students. Secondary sources were taken based on observations and book notes for biology subjects in class X IPA1 on Bacteria material.

2.5 Data Collection Techniques

Document technique in the form of a list of grades in class X IPA1. The test technique is a written test of student learning outcomes on Bacteria (Archaeobacteria and Eubacteria) in cycle I and Protista in cycle II. The written test uses multiple choice questions in cycle I and a description of Protista. The non-test technique is in the form of picture/photo documentation while students are studying, observing the implementation and progress of the learning process (before, during and after the current cycle) with collaborators attached observation sheets for both cycle I and cycle II.

2.6 Data Collection Tools

List of values and other supporting notes, multiple choice test questions, short answers/elaboration. The questions we created included two questions, the first and second cycles. Observation sheet on the ongoing learning process.

2.7 Validation

In order to obtain valid data, when creating a grid, the contents of the questions are adjusted to the valid applicable curriculum. This is done by triangulating sources originating from several sources and through colleagues (collaboration). Coincidentally, at that time there was a PPL UNTIRTA student named Ikha Primarinda. Method triangulation comes from several methods that use several data collection techniques or tools, for example documents.

2.8 Data Analysis

Data analysis using quantitative and qualitative methods. Quantitative data uses comparative descriptive analysis, namely comparing the initial condition values with cycle one, also with cycle two and initial conditions compared with final conditions. Qualitative data was carried out using qualitative descriptive analysis, based on observation results and reflection results. The method is to compare the learning process using the jigsaw method during the initial conditions with cycle one, compare the process in cycle one with cycle two, and compare the initial conditions with the final conditions.

2.9 Work Indicators

In the initial conditions, the average score within the KKM limit was 75. Seeing this reality, with the hope that after carrying out class actions, in cycle I and cycle II it is hoped that learning outcomes will increase, reaching 75%. Students in class above $KKM < 75$. It is also hoped that during the learning process from the initial conditions of the learning process there will still be many students who are passive, most students do not dare to ask questions. Student activity in learning and discussions is still low. After class action in cycle I and cycle II, it is hoped that students will be less passive during group work. Very few students did not dare to ask questions during the discussion. Student activity in discussions is high.

2.10 Action Procedure

The class action carried out consisted of two cycles. Next, data analysis for each cycle is carried out inductively. Each cycle is held 3 times. Each meeting lasts 2x45 minutes. There are four stages in cycle one and cycle two, including, (1) Planning or action planning stage, (2) Acting or carrying out actions, (3) Observing or making observations stage, and (4) Reflecting or reflection stage.

Implementation of class actions in cycle I using the jigsaw method, each cycle according to plan 3 meetings. At the stage 1 meeting, students were told that they would receive cooperative learning using the jigsaw method on Bacteria material without presentations, just discussion in the expert group, and reporting the results of the discussion in the original group. At the second meeting, each home group prepared the results of discussions from each expert group to be submitted to the head of the home group. Researchers and collaborators observe the progress of the discussion, both in the original group and in the expert group. Students were told that at the third meeting, an objective written test would be held to measure the success or failure of cooperative learning using the jigsaw method. At the third meeting, students were given 30 objective test questions to measure success or failure with cooperative learning using the jigsaw method.

In the implementation of cycle II class actions, by applying the jigsaw method, each cycle was according to the plan for 3 meetings. At the stage 1 meeting, students were told that they would be given cooperative learning using the jigsaw method on Protista material. In carrying out the action, what needs to be paid attention to is how to use the jigsaw method. Each cycle is contained in the implementation of Teaching and Learning Activities. The steps in implementing

the action are as follows. Presenting problems by providing problems that have been formulated by the teacher to be solved. At the second meeting, each home group prepares the results of discussions from each expert to be submitted to the head of the home group who will present it in front of the class. Researchers and collaborators observed the progress of the discussion, both in the original group and in other groups, and informed them that at the third meeting there would be a written test in the form of a description, to measure the success or failure of cooperative learning using the jigsaw method. At the third meeting, students were given a description test of 8 questions to measure whether or not they were successful with cooperative learning using the jigsaw method

3. RESEARCH RESULTS AND DISCUSSION

3.1 Description of First Cycle Results

In Biology Learning using the jigsaw method it can improve learning outcomes from the initial condition of an average score of 75 in cycle I to 81. The lowest score which was originally 43 increased to 73. The highest score increased by 10.11% from 89 to 98. There were 31 students who had completed with a score above 75 (KKM) with a percentage of 98.87%, however, to ensure whether activity increased and really increased, it was necessary to continue in cycle II.

3.2 Description of Second Cycle Results

Data collection uses observation, document, test and non-test techniques. Data collection was obtained from initial conditions, cycle I results, and cycle II results. The average value of the class in the initial condition was 75, the results of cycle I were 81, and the results of cycle II were 92. The results of the research data collection showed that there was an increase in the average value of the initial condition in cycle I, by 8% from an average of 75 to 81. The average value from cycle I to cycle II increased by 13.58%, from 81 to 92. Likewise, the average value from the initial condition to the final condition, there was an increase of 22.66% from the average value of 75 to 92. The learning results show above the performance indicator set for an average score above 75 on the KKM, in cycle I it was achieved with a score of 81, while in cycle II it was achieved 92. The percentage indicator set at 75% of students completed was above 75 (KKM), whereas in reality after carrying out class actions it was achieved in cycle I that 98.87% of students had completed and in cycle II achieved 100% of students had completed.

3.3 Research Results

The results of class actions are through empirical truth (theoretical truth in the form of a hypothesis). Theoretically, truth is obtained from theoretical studies, frameworks of thought, and proposing hypotheses. Learning outcomes, starting from the problems faced by students with low test scores and ending with changes in increasing learning outcomes, it is recommended that studying biology about bacteria using the jigsaw method can increase the average score of 75 achieved in the initial conditions. After holding class actions using the jigsaw method, in the final condition the average score was 92. Thus, there was an increase of 22.66%. There has been an improvement in the biology learning process from the initial condition to the final condition. Initially there were still many students who were passive, most students did not dare to ask questions, and student activity in learning and discussions was still low. After the class action was carried out, there were few students who were passive during group work. Very few students did not dare to ask questions during discussions. Student activity in discussions is high. Students gain experience learning in groups, have the courage to express opinions in front of their friends,

are responsible, practice cooperation, and are willing to accept criticism and suggestions. Overall, biology learning using the jigsaw method is said to be successful, because it can improve biology learning outcomes about bacteria for students in class

4. CONCLUSION

Learning using the jigsaw method has a positive impact in improving student learning achievement which is marked by increasing student learning completeness in each cycle, namely cycle I (65.22%), cycle II (78.26%), cycle III (91.30%) . The application of the jigsaw method can increase students' learning motivation, as shown by the average answer of students who stated they were interested and interested in the jigsaw method, so that they became motivated to learn.

5. BIBLIOGRAPHY

- Ahmadi, A. (1995). Teknik Belajar yang Tepat. Semarang: Penerbit Mutiara Permata Widya
- Ali, M. (2000). Guru Dalam Proses Belajar Mengajar. Bandung: Sinar Baru Argensindo.
- Amien, M. (1992). Pendidikan IPA Menjelang Abad 21. Jakarta: Depdikbud.
- Anitah, S. (2007). Media Pembelajaran, Panitia Sertifikasi Guru Rayon 13, Surakarta
- Arifin, Z. (1990). Evaluasi Instruksional Prinsip Teknik Prosedur. Bandung : Rosda Karya.
- Arikunto, S. (1998). Dasar-dasar Evaluasi Pendidikan. Jakarta: Bumi Aksara.
- Arikunto, S. (2006). Prosedur Penelitian Suatu Pendekatan Praktik. Jakarta: Rineksa Cipta.
- Badan Standar Nasional Pendidikan. (2006). Kurikulum Tingkat Satuan Pendidikan Jenjang Pendidikan Dasar dan Menengah. Jakarta: BNSP .
- Departemen Pendidikan dan Kebudayaan, (1994). Kurikulum Sekolah Menengah Umum (GBPP) Mata Pelajaran Biology, Depdikbud, Jakarta.
- Dimiyati & Mudjiono. (2002). Belajar dan Pembelajaran. Jakarta: Rineka Cipta.
- Gagne, R.M & Driscoll, M.P.(1989). Esseniol Of Learning for Intructiona. New Jersey: Prentie Hall. Inc Englewood Cliffs.
- Hamalik, O. (2002). *Proses Belajar Belajar*. Bandung: Remaja Rosdakarya
- Mulyadi, H.P. (2006). Permasalahan Dalam Peneletian Tindakan. Semarang: Lembaga Penjamin Mutu Pendidikan Jawa Tengah.
- PERMEDIKNAS. (2006). Standar Kompetensi Lulusan Untuk Satuan Pendidikan Dasar Dan Menengah, Mendiknas, Jakarta.
- Purwanto, N. (1997). Psikologi Pendidikan. Bandung: Rosda Karya.
- Snellbeker, G. (1974). Learning Theory, Instructional Theory and Psychaeducational Design. New York: Graw Hill Book Company
- Soemanto, W. (1998). Psikologi Pendidikan. Jakarta: Rineka Cipta
- Sudjana, N. (2002). Penilaian Hasil Proses Belajar Mengajar. Bandung: Remaja Rosdakarya.
- Surakhmad, W. (1994). Pengantar Interaksi Mengajar Belajar. Bandung: Tarsito.
- Suryobroto. (1997). Proses Belajar Mengajar Disekolah. Jakarta: Rineka Cipta.
- Syaiful, B. D & Zain, M. (1995).Strategi Belajar Mengajar. Jakarta: Rineka Cipta.
- Syaiful, B. D. (1994). Prestasi Belajar dan Kompetensi Guru. Surabaya: Usaha Nasional.
- Winkel,W.S. (1991). Psikologi Pengajaran. Jakarta: Rineka Cipta.