

Efforts to Improve the Learning Outcomes of Natural Education Measuring the Function of Human Body Tools through Puzzles Picture Game

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ABSTRACT

Background. This research was conducted to improve the learning outcomes of Natural Education (IPA) in grade IV students of State Elementary School (SD) 2 Sereang through the application of puzzles picture game. This method was chosen to improve students' understanding of the material on the function of human body tools.

Purpose. Describe the learning process of Natural Education (IPA) material on the function of human body tools through puzzles picture game in grade IV students of State Elementary School (SD) 2 Sereang. Describe the application of puzzles picture game in improving the learning outcomes of Natural Education (IPA) in grade IV students of State Elementary School (SD) 2 Sereang.

Method. This research is a classroom action research. The subjects of the study were 12 grade IV students of State Elementary School (SD) 2 Sereang in the odd semester of the 2019/2020 school year. The data collection method uses tests, observations, and documentation. The research instruments are in the form of tests and observation sheets. Data analysis uses quantitative and qualitative descriptive techniques.

Results. There was an increase in the learning outcomes of Natural Education Sciences (IPA) students after the implementation of puzzle picture games. The average score increased from 62.8 to 68.4 in the first cycle (up 5.6%), and to 75.6 in the second cycle (up 7.2%). The percentage of students who obtained a score of ≥ 70 increased from 33.3% to 50% in the first cycle, and 83.3% in the second cycle. The average student activity increased from 66.3 in the first cycle to 72.3 in the second cycle.

Conclusion. The application of puzzles picture games is effective in improving learning outcomes and student activities in learning Natural Education (IPA) material on the function of human body organs in grade IV students of State Elementary School (SD) 2 Sereang.

KEYWORDS

Learning Outcomes, Natural Education Sciences (IPA), Puzzles Picture Game.

INTRODUCTION

Teachers are one of the factors that have a direct influence on the improvement of quality. Teacher is a position that is chosen based on vocational principles, in terms of psychological aspects being a factor to carry out his duties and responsibilities as an educator (Oemar Hamalik, 2002:24).

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Improving the quality of primary and secondary education as well as the quality of Natural Education (IPA) lessons in primary schools needs to change the positive mindset that is used as the basis for curriculum implementation. In learning activities, teachers of Natural Education (IPA) subjects use various strategies that require the involvement and active role of students in observing, predicting, applying concepts and communicating them. Student activities and involvement as a whole are very important so that learning activities achieve their goals. The existence of student learning activities optimally will determine the level of understanding and student learning outcomes.

In the past, the teaching and learning process for Natural Education (IPA) subjects was focused on teachers and less focused on students. As a result, teaching and learning activities are more emphasized on teaching than learning. Looking at the field conditions in grade IV in the odd semester at the State Elementary School (SD) 2 Sereang, namely through direct observation by researchers, it can be seen that students are less involved in learning Natural Sciences. This results in low learning outcomes, with an average score of only 62.8. Of the 12 grade IV students, only 4 people (33.3%) achieved the KKM set by the school, which was 70.00. Another condition is that student learning activities tend to be low and monotonous, characterized by students who prefer to be lectured, very few students who want to ask questions, few students are able to answer questions, and the examples of subject matter provided by teachers are still not related to the daily life environment of students.

Such a learning condition of Natural Education Sciences (IPA) will have a less encouraging impact on student learning outcomes, and furthermore can cause a bad impression on the learning of Natural Education Sciences (IPA) such as knowledge of Natural Education Sciences (IPA) is only theoretical. By being aware of the symptoms or realities mentioned above, it encourages the author to conduct research to examine the improvement of student learning outcomes with puzzle games in the learning of Natural Education Sciences (IPA) on the material "The Function of Human Body Tools" in grade IV of State Elementary School (SD) 2 Sereang. A fun and meaningful learning innovation to help students achieve competence through contextual learning experiences with elements of play in it. This action was deliberately chosen because elementary school students still like learning if there is an element of playing in it (learning by doing and playing). But playing in this context does not mean learning while playing or learning just a joke, but playing with meaning.

Based on the description above, the researcher was encouraged to conduct a study entitled "Improving the Learning Outcomes of Natural Education (IPA) Human Body Organ Function Materials Through Puzzles Picture Game in Grade IV Students of State Elementary School (SD) 2 Sereang".

RESEARCH METHODOLOGY

The research location used in this study is at the State Elementary School (SD) 2 Sereang Academic Year 2019/2020. This school is located at Jalan Porong Pangkajene Sereang, Maritengngae District, Sidenreng Rappang Regency, with the reason that the author serves at the school. Data collection in this study was carried out from September to November 2019. The subjects of this study are grade IV students of State Elementary School (SD) 2 Sereang Odd Semester Academic Year 2019/2020, which is as many as 12 students. Meanwhile, the object of this research is the learning results of Natural Education (IPA) material on the function of human body tools through puzzles picture games. The data sources used in this study are the results of formative tests in cycle I and cycle II, as well as the results of observations of student activities in the classroom. The data collection technique is carried out by observation. The instruments used to

carry out the research are (1) action observation documents in the form of notes on students in learning Natural Education (IPA) during learning, analysis action documents at the end of each cycle. (2) Another source of information is the collaborator (teacher) who observes during the implementation of the action. (3) Test sheets in the form of questions used to see the mastery of the concepts of learning materials about the human digestive system that have been taught. During the learning process, student activities continue to be observed by observers and researchers. The things observed were a) actively compiling puzzle pictures in groups, b) reading resource books to complete tasks in worksheets, c) interacting with classmates in solving problems, d) recording the results of the discussion in the worksheet, e) asking questions in class discussions, f) answering questions from friends in class discussions, g) making conclusions about the results of class discussions.

The results of the class discussion. The data obtained is analyzed and described according to the existing problems in the form of a report on the results of the research. The interactive learning design and the assignment of group work assignments were validated by the teacher. The data from the observation of student learning activity were analyzed using a simple descriptive analysis by calculating the percentage increase in student motivation in teaching and learning activities in the classroom. The criteria for success indicators are as follows: 1) If the average daily test results of students and formative test scores are more than 70 (70%), learning can be said to be successful; 2) If the average daily test result is less than 70 (70%), the learning has not been successful so it is necessary to continue to cycle II; 3) Average score is the sum of the total scores divided by the number of students studied; 4) The percentage of average score is the sum of the total score divided by the number of students studied and the result multiplied by one hundred percent. The form of this research is classroom action research (Classroom Action Research), which is reflective actions by actors to improve the learning process. Sudarsono (2002:24) provides limitations on classroom action research, which is a form of research that is reflexive by carrying out certain actions in order to improve and improve learning practices in the classroom professionally. The research is carried out through four steps in each research cycle, namely planning, action, observation and reflection as well as work indicators. The second cycle is carried out referring to the previous cycle by perfecting all the shortcomings that existed in the first cycle.

RESULT AND DISCUSSION

Results of Pre-Cycle Research Before the action was taken, the teaching and learning process for Natural Education (IPA) subjects was still focused on teachers and less focused on students. As a result, teaching and learning activities are more emphasized on teaching than learning. This condition makes the learning activities of grade IV students tend to be low and monotonous, characterized by students who are more happy to be lectured, very few students who want to ask questions, few students are able to answer questions, and the examples of subject matter given by teachers are still not related to the daily life environment of students. This is what causes the average score of Natural Education (IPA) learning outcomes on the function of human body organs to be low. Student learning outcomes in pre-action can be grouped based on their score range. The grouping of pre-action values for more details can be seen in the following table.

Tabel 1. Pengelompokan Nilai Siswa pada Pra Tindakan

Nilai	Kriteria	Jumlah siswa	%
0-54	Sangat kurang	0	0
55-59	Kurang	3	25
60-69	Cukup	5	41.7
70-84	Baik	4	33.3
85-100	Sangat baik	0	0
Jumlah		12	100

Table 1. Grouping of Pre-Action Student Grades

The table above shows that no student obtained a score of 0-54 or on the criteria of very little or very poor. Students who obtained a score of 55-59 or on the criteria of less amounted to 3 students. Students who obtained a score of 60-69 or on the criteria were enough to number 5 students. Students who obtained a score of 70-84 or on the good criteria amounted to 4 students. No student obtained a score of 85-100 or on excellent criteria. The learning outcomes of students in the pre-action can be seen in the following table.

Tabel 2. Hasil Belajar Siswa pada Pra Tindakan

No	Keterangan	Pra Tindakan
1.	Nilai <70	8 siswa (66.7%)
2.	Nilai ≥70	4 siswa (33.3%)

Table 2. Pre-Action Student Learning Outcomes

Based on the table above, it is known that out of the total new students there are 8 students or 66.7% of the total number of students who obtained a score of 70. The average score of students in the pre-action was 62.8. The data shows that 70% of the students who have not obtained a score of ≥ 70 , which is still far from the expected target. Based on the results of observations and pre-actions that have been carried out on the learning process of Natural Education (IPA), an improvement plan has been prepared for the learning process through puzzles picture games so that it is expected to improve the learning outcomes of Natural Education (IPA) in grade IV students of State Elementary School (SD) 2 Sereang Odd Semester Academic Year 2019/2020. Cycle I Based on the results of the initial reflection, the researcher develops an action plan to solve the problem specified in the initial reflection. This planning includes preparing a draft action in the form of a Learning Implementation Plan, data collection instruments in the form of planning and data analysis signs (targets). The first cycle was carried out by involving 12 grade IV students of State Elementary School (SD) 2 Sereang with material on the Function of Human Body Tools. Student learning outcomes in cycle I can be grouped based on their score range. The grouping of student grades in cycle I for more details can be seen in the following table.

Tabel 3. Pengelompokan Nilai Siswa pada Siklus I

Nilai	Kriteria	Jumlah siswa	%
0-54	Sangat kurang	0	0
55-59	Kurang	1	8.333
60-69	Cukup	5	41.67
70-84	Baik	5	41.67
85-100	Sangat baik	1	8.333
Jumlah		12	100

Table 3. Grouping of Student Grades in Cycle I

The table above shows that no student obtained a score of 0-54 or on the criteria of very little or very poor. Students who obtained a score of 55-59 or on the criteria of less than 1 student. Students who obtained a score of 60-69 or on the criteria were enough to number 5 students. Students who obtained a score of 70-84 or on the good criteria amounted to 5 students. Students who obtained a score of 85-100 or on the criteria of excellent were 1 student. Based on the grouping of values above, the learning outcomes of students in cycle I are obtained which can be seen in the following table

Tabel 4. Hasil Belajar Siswa Siklus I

No	Keterangan	Pra Tindakan
1.	Nilai <70	6 siswa (50%)
2.	Nilai $\geq$ 70	6 siswa (50%)

Table 4. Student Learning Outcomes Cycle I

Based on the table above, it is known that out of the total students there are 6 students or 50% of the total number of students who obtained a score of <70. Meanwhile, 6 students or 50% of the total number of students obtained a score of $\geq$ 70. The average score of students in the first cycle was 68.4. The data shows that 70% of the number of students who have not obtained a score of $\geq$ 70, this has not met the expected target. The percentage of student activity observation in cycle I can be seen in the following table.

Tabel 5. Persentase pengamatan siswa pada Siklus I

Aktivitas yang diamati	(%)	Kategori
Antusias siswa dalam menerima pertanyaan guru	63	Cukup
Menjawab pertanyaan guru	65	Cukup
Aktif dalam diskusi kelompok	67	Cukup
Aktif dalam mencari dan mencatat hal-hal penting	70	Baik
Rata-Rata	66.3	Cukup

Table 5. Presentation of Student Observation Cycle I

Based on the table above, the results of the observation of student activity in the first cycle were seen that 63% of the students were enthusiastic in receiving the teacher's questions, 65% of the students were able to answer questions about assignments individually or in groups, 67% of the students were active in group discussions, 70% of the students were active in finding and recording important things. The average student activity in the first cycle was 66.3 with the category of adequate.

The results of the first cycle of reflection include: a) Group cooperation has not been maximized, students are still shy to express their opinions; b) Students who are smart seem to be more dominant in group activities; c) The puzzle picture given is only one for each group (with the number of group members of 4 students) so that the time given is a lot left and this results in the emergence of negative attitudes from several students; d) Not all students are active in the learning process using puzzle games, this is evidenced by only a few students actively participating in group activities.

From the results of observation and reflection, the researcher must take the following steps: a) motivate students to be active in learning activities; b) increase the number of group groups so that the time to do the puzzle is longer.

Cycle II

Student learning outcomes in cycle II can be grouped based on their score range. The grouping of student grades in cycle II for more details can be seen in the following table.

Tabel 6. Pengelompokan Nilai Siswa pada Siklus II

Nilai	Kriteria	Jumlah siswa	%
0-54	Sangat kurang	0	0
55-59	Kurang	0	0
60-69	Cukup	2	16.7
70-84	Baik	8	66.7
85-100	Sangat baik	2	16.7
Jumlah		12	100

Table 6. Grouping of Student Grades in Cycle II

The table above shows that no student obtained a score of 55-59 or on the criteria of less. Students who obtained a score of 60-69 or on the criteria were quite 2 students. Students who obtained a score of 70-84 or on good criteria amounted to 8 students. Students who obtained a score of 85-100 or on the criteria of very good amounted to 2 students.

Based on the grouping of grades above, the learning outcomes of students in cycle II are obtained which can be seen in the following table.

Tabel 7. Hasil Belajar Siswa Siklus II

No	Keterangan	Pra Tindakan
1.	Nilai <70	2 siswa (16.7%)
2.	Nilai ≥70	10 siswa (83.3%)

Table 7. Student Learning Outcomes Cycle II

Based on the table above, it is known that from the total students there are 2 students or 16.7% of the total number of students who obtained a score of <70 . Meanwhile, 10 students or 83.3% of the total students obtained a score of ≥ 70 . The average score of students in cycle II was 75.6. The data shows that 70% of the students have obtained a score of ≥ 70 , which has met the expected target. The percentage of student activity observation in cycle II can be seen in the following table.

Tabel 8. Persentase Pengamatan Siswa pada Siklus II

Aktivitas yang Diamati	(%)	Kategori
Antusias siswa dalam menerima pertanyaan guru	74	Baik
Menjawab pertanyaan guru	73	Baik
Aktif dalam diskusi kelompok	70	Baik
Aktif dalam mencari dan mencatat hal-hal penting	72	Baik
Rata-Rata	72.3	Baik

Table 8. Student Observation Presentation in Cycle II

Based on the table above, the results of the observation of student activities in the first cycle were seen that 74% of the students were enthusiastic in receiving the teacher's questions, 73% of the students were able to answer questions about assignments individually or in groups, 70% of the students were active in group discussions, 72% of the students were active in finding and recording important things. The average student activity in the first cycle was 72.3 with a good category.

The implementation of Natural Education Science (IPA) learning through *puzzles picture game*, the learning outcomes of Natural Education Science (IPA) in cycle II have reached the criteria for the success of actions. Students who achieved the criteria for the success of the action in cycle II were 10 students or 83.3% of the total number of students. That means that 83.3% of the students obtained a score of ≥ 70 . From the results that have been met, therefore this research was stopped in cycle II.

The results of the second cycle reflection include: 1) The students' activities seemed good where they were more busy arranging pictures in groups, then trying to seriously solve the problems in the worksheets given by the teacher; 2) Students who are smart no longer stand out in the group, teachers have succeeded in motivating students who are at the lower level to be more active in expressing their opinions; 3) The classroom atmosphere is more controlled, because in the second cycle student learning activities are divided into 3 groups. Each group worked on 1 puzzle picture and the number of members of each group was 4 people. So that the time to do the task is longer; 4) Students prefer learning using *puzzle pictures*, this is evidenced by the fact that all students are actively involved in doing the assignments given by the teacher and are very enthusiastic to find the answers to the worksheets by reading the source book.

Based on the results of the observation above, the researcher decided to stop this study in cycle II because it was considered successful and the KKM set of 70.00 had been achieved. However, researchers continue to strive to further improve learning outcomes by applying new innovations in the learning process.

DISCUSSION

Student activities in the first cycle have shifted from the initial condition before the action was taken, but it has not been maximized. In the activity of compiling puzzle pictures, all group members have not participated. There are still students who do not want to know what their friends are doing and just accept the results that their friends have made.

Cooperation activities or discussions carried out in the first cycle are still dominated by several students. The students who appeared to speak were just that and the students who were at the lower level were still shy to express their opinions.

Meanwhile, in the second cycle, students become more active, motivated, more challenged to learn, positive attitudes appear and negative attitudes are reduced. Students are more often active in compiling *puzzle* pictures, interacting with their peers and caring about their friends, being active in class discussions and diligently reading source books to solve problems in the LKS.

Learning while playing is an overview of the teaching and learning process observed in this study, students become enthusiastic in learning, the classroom atmosphere becomes lively, teachers can become facilitators and motivators. More importantly, there is an increase in students' understanding of subject matter concepts.

In addition, the pattern of group formation that combines the teacher's considerations with the student's ability and students' desires produces a harmonious group. Between students who are good and those who are not good at it, a good relationship is established so that they help each other in discussion activities. In the end, there was an increase in student learning outcomes after the learning outcome test was conducted by the teacher.

From the data on student learning outcomes, it can be seen that there is an increase in students' understanding of the subject of Natural Education (IPA), especially in the material on the function of human body organs. We can see this in cycle I. The average score of student learning outcomes increased by 5.6% from the initial condition of 62.8 to 68.4 in cycle I, and increased again by 7.2% to 75.6 in cycle II. Students who obtained a score of ≥ 70 increased by 16.7% from the initial condition of 33.3% to 50% in the first cycle, and increased again by 33.3% to 83.3% in the second cycle. Thus the second cycle has reached the specified action success criteria, which is 70% of the number of students who obtained a score of ≥ 70 , so the research stopped in the second cycle.

An increase also occurred in student activities through *puzzles picture games* in Natural Education (IPA) subjects. The enthusiasm of students in receiving teachers' questions in the first cycle was 63%, increasing by 11% to 74% in the second cycle. Student activity answered teachers' questions in cycle I, which was 65%, increased by 8% to 73% in cycle II. Student activity in groups in the first cycle was 67%, increasing by 3% to 70% in the second cycle. Student activity was active in finding and recording important things in the first cycle, which was 70%, increasing by 2% to 72% in the second cycle. The average observation of student activity in the first cycle was 66.3, an increase of 6% to 72.3.

The results of the research that have been carried out state that through *puzzles picture games* can improve the learning outcomes of Natural Education (IPA) material on the function of human body tools in grade IV students of State Elementary School (SD) 2 Sereang Odd Semester Academic Year 2019/2020.

CONCLUSION

Referring to the results of the research, the discussion of the conclusions and suggestions of the results of this research are as follows: 1) Natural Education Science (IPA) Learning to be sought

to prioritize actively encouraging students; 2) Puzzle games can be used as an alternative for teachers to improve their understanding of concepts for students in Natural Education (IPA) subjects; 3) Teachers should prepare several interesting alternative images to use in the learning process; 4) Reading materials or learning resources for Natural Education (IPA) need to be sought by teachers to be more in line with the competencies demanded by the curriculum; 5) In order for student activities in learning to be monitored better, it is necessary to develop instruments that can really cover all learning activities.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

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