

Effectiveness of Student Learning Outcomes Through Numbered Head Together Method Theme of Changes in The Appearance of The Earth and Sky

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ABSTRACT

This research was motivated by the lack of understanding of students in the natural science material in grade IV Cluster II Ahmad Yani, Surakarta City. Out of 150 students, only 32% of students exceeded the minimum completeness criteria; on the other hand, 68% of students still had results that were still less than the minimum completeness criteria. The causative factor is the way teachers teach, which is not varied and tends to be boring. Teachers teach more in conventional ways, so students become fixated and less active during learning. The purpose of the research is to increase student learning outcomes on the numbered head together practice model directly with globe and flashlight media and to find out the process of day and night and to find out whether this model can run well. This research is classified as classroom action research that uses 2 cycles. Cycle 1 will be held on May 6, 2024, and cycle 2 will be held the following month, on June 3, 2024. Based on the results of the research on the numbered head together learning model, the results of the students' study can increase students' understanding of the lesson of changes in the appearance of the earth and sky. This is evidenced by the development of the percentage of student learning completeness starting from the first cycle, where only 32% increased to 79%. So, in cycle 2 completeness has been classically achieved. It can be concluded that the numbered head together learning model and using media can increase students' understanding and improve student learning outcomes on the lesson of changes in the appearance of the earth and sky.

Keywords: *Numbered Head Together, learning outcomes, earth and sky apparitions*



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INTRODUCTION

Challenges in the world of education are increasingly complex with the advent of the Society 5.0 era, which demands educators' readiness to integrate innovative learning methods to improve student competency (Wibawanto et al., 2021). Natural Science learning has obstacles that are often experienced in Natural Science learning, including moderate learning, focusing on the concepts contained in the book and not using an environmental approach to learning. Some educators are maintaining the order in the book without looking at the suitability of the student's environment (Cahyono, 2023). This problem causes inefficient learning, therefore students do not respond to the material provided. So, this kind of learning will result in saturation in students (Karoso & Cahyono, 2024). Pedagogical innovation is the main key in overcoming learning boredom, where teachers must be able to transform conventional teaching

methods to be more dynamic and relevant to current developments (Raziana & Wibawanto, 2025).

In carrying out the learning process, teachers are expected not to use the usual methods, in the sense that in the coming years teaching and learning methods will not improve, educators who always use this monotonous method can cause problems that they do not understand (Hidayati et al., 2024). Therefore, as a teacher, it is mandatory to have a sense of knowing the interests of students, especially when serving and giving a lesson. Therefore, it is very necessary for a teacher to vary his teaching methods. Which is more suitable for providing material in such a way that the teaching and learning outcomes are successful to the maximum (Herwiyanti et al., 2019). In addition to methods, the use of appropriate learning media is crucial to support the effectiveness of material delivery, especially during the adaptation period to new habits that require flexible learning methods (Wibawanto & Roemintoyo, 2020).

The Numbered Head Together (NHT) learning model is a collaborative learning model that can increase student interest and involvement in learning. This model allows each student to be responsible for their group's understanding, which has been shown to improve engagement and academic achievement across various subjects (Prakoso & Radia, 2019; Fauziah, 2019; Iskatiana, 2017). The NHT model has proven effective in improving students' cognitive and social skills at various levels of education, from early childhood to secondary school. The use of this strategy also significantly improves students' science process skills, such as observation and prediction, which are highly relevant in science learning (Mahmudah & Rasyid, 2022; Palupi et al., 2022; Wiratman & Putri, 2023).

Before using the numbered head together Students often experience a lack of understanding in the learning process, so that teachers often repeat the material in general still using conventional methods and media which the reason is that teachers use conventional methods is the first is easy does not require preparation but it tends to be monotonous and boring so that students do not get meaningful learning so that the material taught by students is easily forgotten (Novibriawan et al., 2021).

Poor learning outcomes are often triggered by students' boredom with monotonous lecture methods, especially in subjects considered difficult, such as mathematics and language arts. Studies show that integrating NHT with other learning models, such as problem-solving or discovery learning, can be a solution to increase student engagement (Aditya et al., 2022; Setyaningsih & Utami, 2021; Suradi & Aliyyah, 2023; Wahyuni & Abidin, 2024). This condition requires the role of teachers to determine the direction of learning that is not boring for students in order to attract students' interest in learning, if there is no change, there will be a problem, namely low student interest in learning, not only that, if low interest in learning will affect student learning outcomes, as for the Teacher Working Group II Ahmad Yani Surakarta the students have an increase in student cognition, which is in the natural science class IV (Wijayanti et al., 2017).

However, in the improvement itself, there are several things that are questioned about the method used with this fact, researchers are interested in conducting research in Cluster II Ahmad Yani Surakarta With the above problem, the author raised the title of the article titled: "The Effectiveness of Student Learning Outcomes Through the Numbered Head Together Method of Changing the Theme of Changes in the Appearance of the Earth and Sky".

METHODS

The research method of this article uses the research method Classroom Action Research by type of research field research. The class taken in the observation was class IV in the Ahmad Yani Group II Teacher Working Group with a total of 63 male students and 87 female students. The form of research is Classroom Action Research. Classroom action research is a caustic-based and context-based observation of conditions, circumstances and situations in the classroom that

are carried out to overcome problems that occur in order to improve the quality of learning in the classroom (Meesuk et al., 2020).

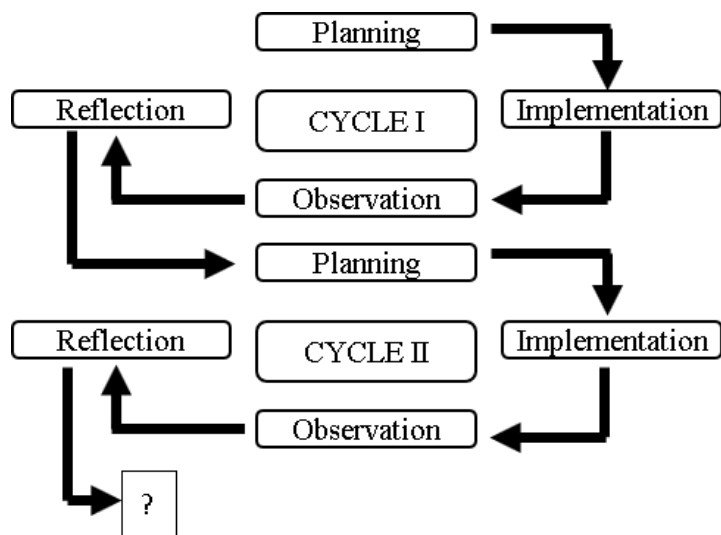


Figure 1. Action Cycle based on Kemmis and Mc Taggart

The explanation of the flow above is:

Pre-Cycle

In this activity, observations were made in grade IV of elementary school in Cluster II Ahmad Yani Surakarta in the even semester of the 2023/2024 school year, a number of 150 students with 63 male students and 87 female students.

At the beginning of the research, the researcher takes care of licensing at the intended school and obtains permission from the school, the researcher conducts research to identify problems and research learning activities in the classroom, the state and atmosphere of the school. In carrying out observations and researchers, they also conducted interviews with several students, students and teachers until the results obtained were close to the same conditions. The purpose of holding this interview is to unite information about teaching and learning activities that have occurred so far.

Cycle I

Planning

Planning is the improvement of the concept of action that is essential to advance what is happening. Planning is made based on real initial observations, therefore the researcher obtained an overview of the existing difficulties. The activities carried out towards the planning stage are as follows:

1. Forming a learning improvement plan for the material on changes in the appearance of the earth and even sky with learning aids.
2. Forming an agenda for the implementation of actions, the implementation of learning improvements in accordance with the content of the learning scenario to be implemented.
3. Forming research instruments that are to be carried out by peers on the application of actions. Namely group tasks and individual tasks.
4. Forming test instruments in accordance with the material and learning benefits.
5. Formulate answers for group work assignments and individual tasks.
6. The RPP and the agenda for the implementation of the actions that have been prepared,

submitted to the principal will apply for approval, as well as the approval of the implementation of the action, and require guidance and direction on the implementation of the action.

7. Prepare an observation sheet in the form of an observation sheet of students and educators along with documentation during the activity.

Implementation

The purpose of the implementation of the action is the implementation of learning activities that have been determined in the learning implementation plan for the subject of Natural Sciences, learning Changes in the Appearance of the Earth and the sky. Natural Science learning in the first cycle is carried out once in accordance with the material that has been determined. In cycle 1, the provision of material is just invited to read and see pictures that are already in the book, students are invited to learn by looking at pictures, so that students in getting lessons understand better as focusing on an image in the book.

Observation

Observation is carried out by observers during the learning method, observing the implementation of learning, observation is carried out by colleagues to research teacher activities and research student activities, then the researcher processes data from the observation sheet filled in by the observer.

Reflection

The reflection of the results of the combined data is then discussed with researchers and colleagues to understand the success of the implementation of actions in cycle I, when there are shortcomings, improvements are carried out to cycle II.

Cycle II

Planning

The activities carried out at this stage are to prepare for learning improvements based on the reflection of Cycle I by implementing the following steps:

1. Prepare a plan for the implementation of improvement learning, improvement observation data, discussion data and improvement evaluation tools.
2. Coordination with colleagues who serve as observers in the process of implementing numbered head together type cooperatives.

Implementation

The purpose of the implementation of the action for cycle II is the application of learning activities that have been prepared related to the learning implementation plan (lesson plan using image media and observing and trying and practicing the causes of changes in the earth and moon with simple props (globes, flashlights and balloons) that are easy to get and are available at school.

Observation

Observation is carried out for observers during learning activities, observing the application of numbered head together cooperative learning, observation is carried out by peers, then the researcher edits the data on the observation sheet that has been filled out by the observer and the results presented have improved compared to the previous cycle.

Reflection

The results obtained from the results of observation and student learning are collected and analyzed, so from the results, the researcher can reflect on the results of the observation whether the activities carried out have improved the quality of the learning process and the learning achievement of students.

Data Analysis Techniques

The technique used in data collection is by looking for sources and constructed from interviews and observations. The interview is a method of collecting data, namely conducting an interview or face-to-face question and answer orally between the questioner and the respondent in order to get the information needed in the research, while the observation technique is a method of data collection that is carried out systematically and is carried out deliberately by observing and recording the phenomenon being researched, observation and interviews are used to collect data in a structured manner. The use of interviews and observations is considered sufficient to dig up information data. The method in this article uses descriptive analysis. Then the data obtained in the form of observation interview results are analyzed critically and in-depth in order to support proportions and ideas

In processing the data of the writer Using the Triangulation method, this method is a data collection technique that has the property of combining data collection techniques and existing data sources. And also, the researcher collects data by the triangulation method, so the researcher collects data that at the same time tests the credibility of the data, namely checking the credibility of the data with various data collection techniques and various data sources

The data obtained was processed so that it was able to answer the formulation of the problem and the purpose of the article Effectiveness of Student Learning Outcomes Through the Numbered Head Together Method Theme Changes in the Appearance of the Earth and Sky.

RESULTS AND DISCUSSION

Results

Pre-Cycle

The researcher conducted observations for 2 days in Cluster II Ahmad Yani Surakarta. With the number of students in each grade IV as many as 150 students consisting of 63 male students and 87 female students. The homeroom teacher of grade IV plays a role in educating students to understand the numbered head together method. Some grade IV students still have problems in learning activities. Likewise, the average learning outcome is still low, which is 64, classical graduation is only 50%. This is because educators provide material delivery very quickly, have not used teaching aids, therefore students have not listened or passively and teachers do not share time or opportunities with students to ask, so that the time to complete the assignment the results obtained are still below the minimum completeness criteria.

Cycle I

Cycle 1 learning will be held on May 5, 2024. The stages of implementation are in accordance with the stages in the numbered head together model. At the planning stage, the activities carried out prepare the concept of cycle 1 learning, educators convey perceptions and motivations, and goals for learning related to the material to be discussed so that students are ready to take the material and have a very strong sense of curiosity about the lessons to be examined. The preliminary activity was followed by core activities. In the implementation of cycle 1, there was a development of student learning outcomes, although not all students were complete in learning. As in the figure 2.

Cycle II

Cycle 2 learning will be carried out on June 3, 2024. The stages of implementation are in accordance with the stages in the numbered head together model. Planning The researcher has prepared a learning improvement plan 2 which is a revision in cycle 1 learning. The instrument that has been prepared is in the form of a learning improvement plan II. Researchers have also provided learning improvement media as well as compiled improvement worksheets for students and made improvement evaluation tools. In the implementation of cycle 2, there was an increase in student learning outcomes compared to cycle 1 as shown in the figure below.

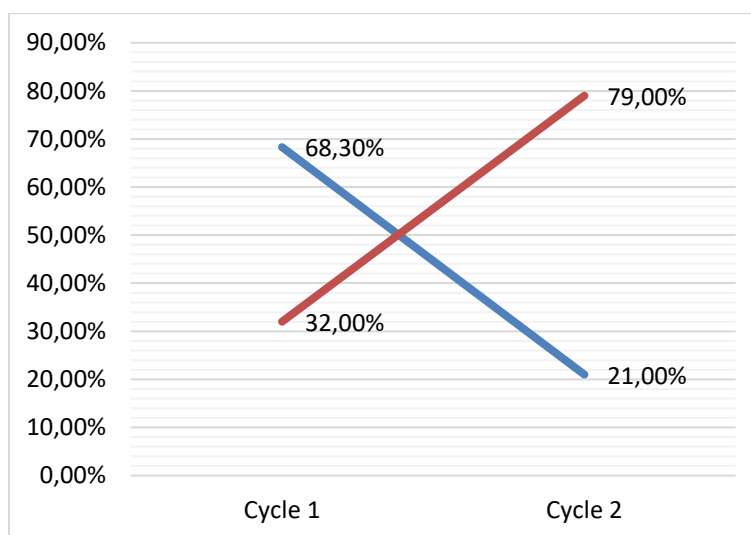


Figure 2. Comparison of Student Learning Completeness from cycle 1 to cycle 2

Based on figure 3 of the diagram above, cycle 2 students who completed the percentage of 79% of 16 students, experienced an increase in learning outcomes from cycle 1 to cycle 2, while those who did not complete the percentage were 21% and the score was still below the minimum completeness criteria. So that the explanation above can be concluded for the average student from the percentage of completeness of each cycle, the percentage of completeness of student learning outcomes has increased from cycle 1 by 47%.

Discussion

Based on figure 3, it can be concluded that the learning outcomes of natural sciences students have increased from cycle I to cycle 2, this shows that the form of numbered head together learning can improve the learning outcomes of natural science students in grade IV in Cluster II Ahmad Yani Surakarta. The average learning result of students in the first cycle was 32%, including in the very low category. In this second cycle, the average result of learning natural sciences of students who have met the requirements for successful observation has increased by 47% because the results of students who complete above the minimum completeness criteria are 135 students (90%) of the total number of students. The significant increase in learning outcomes in Cycle II proves that the use of visual media and simple teaching aids can help students understand abstract concepts in science, in line with the findings that interactive multimedia and simulations are able to stimulate students' interest and active involvement (Wibawanto et al., 2022). In cycle 2, classical completeness is achieved. This achievement is because in teaching, educators use numbered head together learning well. The success of implementing the NHT method also depends heavily on the teacher's ability to manage learning media systematically, thereby creating a structured yet participatory learning environment (Roemintoyo & Wibawanto, 2023). The results of this study align with findings in

other fields of study, where the application of NHT successfully increased classical mastery to 100% on material considered complex. Not only does this model improve learning outcomes, it has also consistently been shown to increase students' self-confidence, vocabulary mastery, and ability to express ideas (Fatmawati et al., 2023; Kusuma et al., 2025; Mahmudah & Rasyid, 2022).

From the results of this observation, it is determined that the form of numbered head together learning has a positive impact on improving student learning outcomes. Students are more free to convey ideas and opinions together with their peers so that their difficulties quickly find a way out. The application of the numbered head together form of learning makes it easier for teachers to teach natural science lessons, especially learning about changes in the appearance of the earth and sky, the equal distribution of material abilities can be achieved in such a short time, can train students to be more active when trying, Speaking and arguing, students who are not good at solving problems can be helped to solve problems so that they can improve learning outcomes in students, students are positively dependent on each other, provide opportunities for students to cooperate with other groups, students fill in among each other.

The effectiveness of NHT in improving learning achievement has also been validated in various other disciplines, including accounting, colloidal chemistry, and reading comprehension in English. Integration with the Flipped Classroom environment has even significantly improved student self-efficacy (Afriyeni, 2020; Meiryani et al., 2021; Melati & Hadinugrahaningsih, 2024). For future development, learning about earth and sky phenomena can also be integrated with Augmented Reality (AR) technology or simulation-based interactive multimedia to provide a more realistic visual experience for students (Wibawanto & Maulana, 2025). Various other comparative and experimental studies confirm that NHT is superior to predictive and traditional learning techniques in improving students' conceptual understanding and learning outcomes in both primary and secondary schools (Agustina et al., 2020; Fauzi et al., 2019; Rambe et al., 2023).

CONCLUSION

According to the results of the research and discussion, it can be concluded that the numbered head together learning method can increase the motivation and learning outcomes of natural sciences in grade IV at the Elementary School in Cluster II Ahmad Yani Surakarta. By applying the numbered head together cooperative learning method, children's absorption of material changes in the appearance of the earth and sky has increased. It can be proven that there was an increase in student learning outcomes which was initially in cycle 1 32%, then increased in cycle II by 79%.

Based on the conclusion above, the following suggestions can be formulated:

1. It is better for elementary school teachers to use a variety of learning methods. For educators who teach natural science lessons, it would be good to always have creativity by using the learning plan given to students; Also try for teachers to pay more attention to students.
2. For students: As a student, it would be nice to be more active and diligent in learning, including in following the learning process in the form of small study groups because it can improve the quality of student learning.
3. For institutions: Facilitate proper facilities and infrastructure to support teaching and learning activities in schools.

CONFLICT OF INTEREST

No conflict of interest for this study.

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