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Enhancing Student Learning Outcomes through Collaborative Learning: A Classroom Action Research using Numbered Head Together (NHT) Model in Elementary Science Education

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Abstrak

Penelitian ini merupakan penelitian tindakan kelas (PTK) yang dilaksanakan dalam dua siklus. Metodologi penelitian meliputi perencanaan, pelaksanaan, observasi dan refleksi pada setiap siklusnya. Pada siklus I diamati permasalahan dalam mengelola dinamika kelompok dan meningkatkan interaksi siswa. Namun melalui refleksi dan perubahan pada siklus II terlihat adanya peningkatan yang cukup besar pada aktivitas guru dan siswa. Paradigma pembelajaran NHT dimanfaatkan sebagai teknik kolaboratif untuk meningkatkan partisipasi dan interaksi siswa dalam kelompok. Hasil penelitian menunjukkan adanya peningkatan yang baik pada aktivitas guru dan siswa serta hasil belajar siswa. Pada siklus II terjadi peningkatan persentase siswa yang mencapai ketuntasan belajar, hal ini menunjukkan efisiensi model pembelajaran NHT dalam meningkatkan prestasi akademik siswa. Kesimpulannya, penerapan model pembelajaran NHT dapat dipandang sebagai pendekatan yang efektif untuk meningkatkan kualitas pembelajaran dan hasil belajar siswa dalam konteks [mata pelajaran tertentu]. Rekomendasi diberikan untuk memasukkan model pembelajaran NHT dalam praktik pembelajaran sehari-hari untuk memperkaya pengalaman belajar siswa dan meningkatkan interaksinya dalam pembelajaran kelompok.

Kata kunci: *Model Pembelajaran Numbered Head Together (NHT), Penelitian Tindakan Kelas (PTK)*

Abstract

This research is classroom action research (PTK) which was carried out across two cycles. Research methodologies include planning, implementation, observation and reflection in each cycle. In cycle I, issues were observed in managing group dynamics and increasing student interaction. However, through reflection and changes in cycle II, a considerable increase in teacher and student activity was noticed. The NHT learning paradigm is utilized as a collaborative technique to improve student participation and interaction in groups. The research results demonstrate a good increase in teacher and student activities as well as student learning outcomes. In cycle II, there was an increase in the percentage of students

who achieved learning completion, showing the efficiency of the NHT learning model in enhancing student academic accomplishment. In conclusion, the adoption of the NHT learning model can be viewed as an effective approach for increasing the quality of learning and student learning outcomes in the context of [particular subjects]. Recommendations are given to include the NHT learning model in daily learning practices to enrich students' learning experiences and increase their interactions in group learning.

Keywords: *Learning Model, Numbered Head Together (NHT), Classroom Action Research (CAR)*

INTRODUCTION

Natural Sciences (IPA) is a systematic approach for examining nature with the objective of collecting knowledge, facts, concepts, principles and discovery processes, as well as building a scientific mindset. Science has a key role in increasing the quality of education, especially in generating students who have the ability to think critically, creatively, logically and take initiative in dealing with societal issues that are influenced by breakthroughs in science and technology (Gerde, 2018).

Teachers that primarily utilize the lecture approach might promote boredom, tiredness, inactivity, and just taking notes in students. This strategy can have a detrimental impact on science learning achievement and indirectly affect the success of science learning (Schmidt et al., 2018). To ensure that the teaching and learning process in elementary schools (SD) operates ideally, teachers must be clever in adopting learning models that can spark students' interest in learning in science disciplines. However, in reality, based on information from the Principal, hurdles in the science learning process still remain, and the results are not optimal. Of the 25 fourth grade elementary school kids, only 20% completed, while 80% of children did not complete, demonstrating difficulty in learning science.

Factors such as perceived difficulty, misunderstanding and boredom in scientific learning create less than ideal learning outcomes (Prayuda et al., 2023). Teachers need to expand their role as motivators, establish a conducive learning climate, and use a range of learning models so that students can be more active and enthusiastic in the learning process (Prayuda et al., 2022). The relevance of instructors as motivators to increase student learning outcomes reveals that students have more potential to attain positive learning outcomes if they like the teacher's manner of teaching (Theobald et al., 2020). Therefore, teachers must adopt an appropriate learning strategy to create exciting and varied learning, especially in teaching science information that requires observation. To achieve this, the implementation of various and appropriate learning models, such as Numbered Head Together, can raise student interest and encourage active engagement in the learning process.

By identifying this problem, efforts need to be made to improve student learning results. One step that can be taken is to introduce relevant and intriguing learning models to increase the quality of learning (Hogan et al., 2015). Choosing the correct learning model can bring considerable advantages in the application of learning. Numbered Head Together (NHT) is a learning strategy that has the potential to improve student learning results in

science disciplines. The NHT learning paradigm offers variation and interaction that helps spark students' interest in learning science. By actively immersing students in learning, this strategy can generate a more dynamic classroom atmosphere and enhance the process of understanding the topic. In addition, NHT gives opportunity for students to collaborate, share ideas, and aid each other in learning complicated science concepts (Oppermann, 2019).

By integrating students directly in learning activities, the NHT approach can encourage student engagement, motivate them to participate, and boost knowledge of science subjects. Therefore, the application of the NHT learning model is projected to provide a good contribution to enhancing student learning outcomes in science topics at the elementary school level. Implementing this strategy can be a strategic step in providing more dynamic, entertaining and successful learning for pupils (Hadi & Novaliyosi, 2019). Apart from that, it is crucial to mention that the Numbered Head Together (NHT) learning model can have a good impact on specific areas of the science learning process in primary school. Students' activeness in cooperation and group learning might create space for them to exchange knowledge and solve difficulties together. During NHT sessions, each student has a significant role in the group, which can boost students' sense of responsibility and participation.

Apart from the issue of student participation, the NHT learning approach can also develop students' social skills. Within this framework, students need to communicate well, share ideas, and support each other (Owens et al., 2020). This can assist pupils build interpersonal communication skills needed in everyday life. The value of the NHT learning paradigm may also be observed from its impact on student learning motivation. Active involvement in group learning can boost students' interest in science courses, because they feel participated in the learning process. The competitive and cooperative aspect of this model can create an engaging setting for pupils, motivating them to seek greater understanding.

By creating and implementing learning using the NHT model, it is envisaged that it can make a good contribution to efforts to improve student learning outcomes at the elementary school level, especially in science disciplines. Applying this paradigm is a strategy that can produce beneficial changes in learning and increase students' grasp of the science subjects being taught.

METHOD

In this research, the Classroom Action Research (PTK) approach was utilized to assess the influence of implementing the learning model on student learning outcomes. The research subjects involved all fourth grade pupils in an elementary school. The research procedure was carried out through the classroom action research technique which consists of four basic stages: planning, implementation, observation and reflection. Data gathering was carried out using observation and test instruments. Data analysis was carried out in three stages, namely data reduction, data exposure, and drawing conclusions. Student learning outcomes are quantified using the formula for learning completeness (KB) and the percentage of classical success (PKK). In addition, the average score of pupils is also determined.

From the findings of data analysis, teacher and student actions were monitored through scores and percentages in cycle I and cycle II. Teacher activity indicated an increase from satisfactory in cycle I (60%) to good in cycle II (71.4%). Meanwhile, student activity showed a rise from satisfactory (68%) in cycle I to good in cycle II (80%). The recapitulation of student learning outcomes reveals a considerable rise. In cycle I, 60% of students completed, but in cycle II, the number of students who completed jumped to 88%. The average student score also climbed from 62.35 in cycle I to 70.08 in cycle II.

Thus, the adoption of the learning model in this research, notably Numbered Head Together (NHT), was proved to have a good contribution to student learning results. Increased instructor and student involvement, as well as an increase in the percentage of students who complete, are signs of the success of this learning model. The NHT learning model might be regarded an effective strategy for enhancing student learning outcomes at the elementary school level. Apart from improving teacher and student participation, the results of data analysis also demonstrate good advancements in student learning outcomes. The recapitulation of students' average scores indicates the growth from cycle I to cycle II. In cycle I, the average student score was 62.35, but in cycle II, the average score jumped to 70.08.

Significant variations were noted in the percentage of students who completed their courses. In cycle I, only 60% of students attained completeness, whereas in cycle II, the number of students who completed jumped to 88%. This suggests that the adoption of the Numbered Head Together (NHT) learning paradigm has a favorable impact on reaching student learning outcomes. This positive development can be seen as a response to the learning model adopted. The NHT learning paradigm, by enabling students to work together in groups and participate actively, appears to be helpful in boosting students' knowledge and learning results.

Thus, the result of this research is that the use of the Numbered Head Together (NHT) learning model has a favorable impact on enhancing the learning outcomes of class IV students at the elementary school level. This learning approach can be utilized as an effective alternative to promote student participation and involvement in the learning process, provide support for understanding the material, and ultimately increase the accomplishment of learning outcomes.

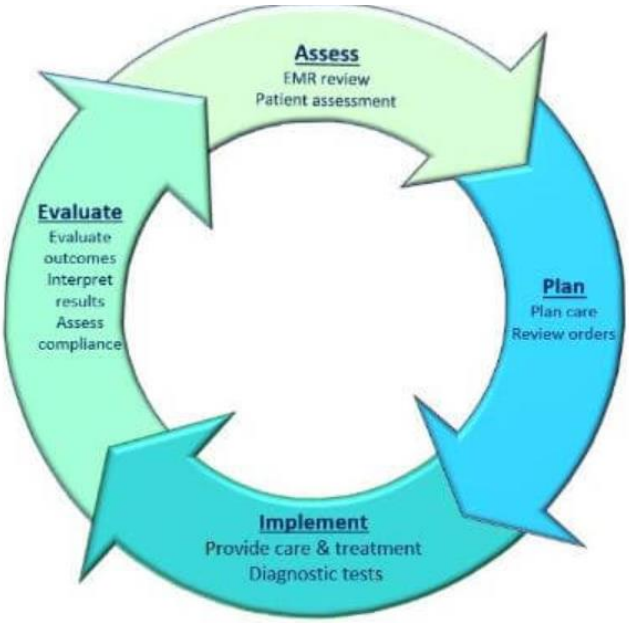

Figure 1. Classroom Action Research

RESULT AND DISCUSSION

Analysis of the data from this research demonstrates significant changes in instructor activities, student activities, and student learning outcomes between cycle I and cycle II. In cycle I, observations of teacher and student activities suggested that the implementation of the Numbered Head Together (NHT) learning model had not achieved the optimal level. Teacher activity was judged as sufficient with a proportion of 60%, while student activity reached 68%, which is likewise characterized as sufficient. However, changes were noted in cycle II, where teacher activity grew to 71.4% (good category), while student activity reached 80% (good category). This shows that there have been advancements in the application of learning and interaction in the classroom.

Furthermore, in terms of learning completeness, cycle I recorded that only 60% of pupils obtained classical completeness. However, in cycle II, there was a huge rise by reaching 88% of students who completed traditionally. With the average class score improving from 62.35 in cycle I to 70.08 in cycle II. This rise suggests that the adoption of the NHT learning model is effective in responding to student learning demands. By providing opportunities for students to work together and actively participate in groups, this strategy can boost student engagement and overall learning results.

Overall, this research makes a good contribution to enhancing student learning results, verifying the premise that the use of the Numbered Head Together Learning Model can improve learning outcomes in science disciplines. This gives a good basis for suggesting the employment of this learning model in the classroom as an effective alternative in increasing the quality of learning at the primary school level. Further analysis of the research

results showed numerous elements that drove changes in instructor activities, student activities, and student learning outcomes between cycle I and cycle II.

Cycle I (Adequate): In cycle I, teacher activities were judged as sufficient (60%). This may be triggered by the teacher's adaptation process to the usage of the new learning model (Numbered Head Together) and the teacher's efforts to manage learning in groups. Cycle II (excellent): There was a large increase in cycle II, achieving an excellent level of teacher participation (71.4%). This shows that there is reflection and adjustment by the teacher towards the application of the learning model, so that the teacher's contact with students is more effective.

Cycle I (Adequate): Student activities in cycle I were judged as sufficient (68%). There may be early hurdles in implementing the new learning approach, which may affect student involvement in groups. Cycle II (Good): A major increase occurred in cycle II, where student involvement reached a good level (80%). This shows that students are more interested and active in the group learning process, in accordance with the aims of the Numbered Head Together learning paradigm.

Cycle I (Completion 60%): The degree of learning completion in cycle I only achieved 60%, indicating that a proportion of pupils still encounter challenges in attaining the established requirements. Cycle II (88% completion): A very considerable improvement occurred in cycle II, obtaining a learning completion level of 88%. This reflects the success of the Numbered Head Together learning paradigm in generating a favorable influence on student learning results.

The positive outcomes in cycle II demonstrate that reflection and adjustment to the execution of the learning model is an effective technique. Teachers can continue to make modifications based on experience from each cycle to increase the quality of learning. The Numbered Head Together learning paradigm has established itself to be an excellent method for enhancing student learning outcomes. Its ability to engage pupils, improve interaction amongst students, and create space for better understanding of subjects, making it a valuable learning paradigm.

By evaluating the elements above, this research gives in-depth insight into the success of applying the Numbered Head Together learning paradigm in increasing the quality of science learning in elementary schools. It can be recommended to continue observations and further study to improve understanding of the usefulness of this paradigm in other learning environments. A deeper study of the research results demonstrates considerable developments in three important dimensions, namely instructor activities, student activities, and student learning outcomes between cycle I and cycle II.

First, in the element of teacher activity, the change from cycle I (60%) to cycle II (71.4%) demonstrates a constant increase. In cycle I, there may be difficulty in adapting to the new learning paradigm (Numbered Head Together), but in cycle II, the teacher has succeeded in overcoming these obstacles. This progress can be ascribed to teachers' capacity to reflect on previous learning experiences, identify areas of development, and proactively alter their techniques. Second, in terms of student activities, there was a notable shift from cycle I (68%) to cycle II (80%). In the beginning, students may experience problems in actively participating in groups, but with time, they show significant growth. This

indicates the success of the Numbered Head Together learning paradigm in generating student engagement and encouraging collaboration between them.

Third, the most notable changes happened in student learning outcomes. Cycle I revealed a learning completion level of 60%, which climbed considerably to 88% in cycle II. This fact demonstrates that the Numbered Head Together learning paradigm has a strong beneficial impact on student achievement. Using this strategy pushes students to be more active in learning, understand things better, and ultimately achieve the necessary level of completeness. Through continual reflection and adjustment, teachers succeeded in overcoming initial difficulties and boosting learning effectiveness. The importance of this reflection not only helps teachers improve their performance, but also indicates that continual professional development is the key to increasing the quality of learning.

It is vital to remark that the success of the Numbered Head Together learning paradigm in this study is a useful contribution to the educational literature. This strategy might be considered an effective option in designing learning experiences that enhance student improvement. Thus, this research gives an in-depth understanding of the relevance of incorporating a diversity of learning approaches in obtaining optimal educational goals. Furthermore, it is encouraged to involve more schools and instructors in similar studies to validate and expand these findings.

In this research, the relationship between the primary variables is clearly obvious in the implementation of the Numbered Head Together (NHT) learning model and its impact on teacher activities, student activities and student learning outcomes. The strong link between these variables provides a detailed understanding of how changes in one variable can affect other ones.

First of all, the application of the NHT learning paradigm directly effects teacher actions. This concept pushes teachers to develop learning that is more participatory and collaborative. In cycle I, when instructor activities were judged as sufficient, this reflected initial difficulty in controlling group dynamics and fostering effective conversations. However, in cycle II, the rise in teacher activity towards the good category suggested that the teacher had succeeded in overcoming these difficulties. This suggests a beneficial association between the application of the NHT learning model and boosting teachers' ability in providing a supportive learning environment.

Second, changes in instructor activity have a direct impact on student activity. Increased teacher participation, especially in steering group discussions, provides more possibilities for students to participate actively. Initially, students may encounter deficits in collaborating, however, over time, they exhibit considerable increases in their participation. Therefore, the positive correlation between teacher activity and student activity shows that improvements in teaching practices might create an environment that fosters student participation and engagement.

Third, the impact of student activities can be detected on student learning outcomes. The large rise in the percentage of students who achieved the level of learning completion (from 60% in cycle I to 88% in cycle II) illustrates that students' active involvement in learning adds greatly to their learning results. The NHT learning paradigm, by encouraging

cooperation and communication amongst students, generates a beneficial correlation between student participation and their academic accomplishment.

CONCLUSION

The research process consists of two cycles with the stages of planning, implementation, observation and reflection. First, the introduction of the NHT learning paradigm has a good impact on teacher activities. Cycle I represented the initial difficulty in managing group dynamics, however, in cycle II, there was a considerable rise in the teacher's capacity to organize group discussions and produce participatory learning. This indicates that teachers are able to overcome early hurdles and increase the quality of teaching through applying the NHT learning paradigm.

Second, modifications in instructor activities have a good impact on student activities. Research demonstrates that students, although they may first suffer a lack of teamwork, exhibit considerable increases in their engagement during learning. The rise in student involvement suggests a good response to learning styles that stress cooperation and active participation. Third, the impact of student activities is obvious in their learning results. The large rise in the percentage of students who achieved learning completion in cycle II demonstrates that the NHT learning model helps greatly to student academic progress. Students' active involvement in learning is positively connected with an increase in their learning results.

Overall, this research suggests that regular implementation of the NHT learning model can improve the quality of learning, increase student engagement, and improve student learning outcomes. Therefore, the NHT learning model can be viewed as an effective alternative in improving the learning process in the classroom. Thus, ideas for engaging the NHT learning model in daily learning activities are presented so that it can have a positive impact on student learning in diverse educational environments.

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