Journal of Education and Social Science
Vol. 1 No. 1, August 2024, pp. 1-5
E-ISSN 3064-4410

Improving Students' Learning Activities in Physics Science Using the Inductive Thinking Model

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ARTICLE INFO

Article history
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Received: June 7, 2024
Revised: June 10, 2024
Accepted: August 15, 2024
Published: August 18, 2024

Keywords
Learning Activities
Models
Inductive Thinking

ABSTRACT

This research aims to determine the Biology Science learning activities of Class X students at MTs. Addinul Qayyim Kapek uses the Inductive Thinking Model. This type of research is Classroom Action Research (CAR) with the data collection tool used is teacher and student activity observation sheets. Based on data analysis, the results obtained in cycle I, Meeting I, teacher activity score were 59.37% in the quite active category. The action was continued until the second cycle. At the second meeting of cycle II the teacher activity score was 78.12% in the active category. Cycle I Meeting I student activity score was 47.05% in the quite active category. The action was continued until the second cycle. At the second meeting of cycle II, the student activity score was 64.70% in the active category. From these results it can be concluded that the research action was successful because it could increase students' biology learning activities using the Inductive Thinking Learning Model.

How to cite: Syafii, K., Rahman, A. S., & Basyiruddin, B. (2024). Improving Students' Learning Activities in Physics Science Using the Inductive Thinking Model. *Journal of Education and Social Science*, *1*(1), 1-5. https://doi.org/10.70716/jees.v1i1.56

INTRODUCTION

The learning process is the core of educational activities that involve interaction between teachers, students, and the learning environment. Essentially, learning is not merely about receiving information but rather an active process that requires student engagement through both mental and physical activities. This aligns with the principle of "learning by doing," which emphasizes that learning becomes more meaningful when students are directly involved in real activities that can transform their behavior and skills (Delismar et al., 2013). Thus, student learning activities serve as an important indicator in assessing the success of the learning process.

However, based on preliminary observations at MTs. Addinul Qayyim Kapek, West Lombok Regency, the researcher found that both teacher and student learning activities were still relatively low. This lack of activity was caused by the use of learning models that were not yet effective in increasing student engagement. In practice, teachers still tended to rely on conventional lecture methods and one-way assignments. As a result, the learning process became less interactive, student learning outcomes were not optimal, and students appeared passive in participating in learning activities. This condition indicates the need for innovative learning strategies that are more suited to students' needs in the modern educational era.

One alternative strategy that can be applied is the implementation of the inductive thinking learning model. This model belongs to the information-processing family, which focuses on developing students' thinking abilities through activities such as grouping, categorizing, and testing the validity of a concept. This approach requires students to be active in discovering patterns, generalizing concepts, and applying their findings to broader contexts (Sadieda, 2019). Therefore, the inductive thinking model not only increases learning activities but also fosters critical and creative thinking skills.

In addition, the inductive thinking model aligns with the demands of 21st-century skills, which include critical thinking, creativity, collaboration, and communication (4C). Its application can broaden students' potential in problem-solving, facilitate problem-based learning, and promote personalized learning that better suits students' needs (Zubaidah, 2016). Furthermore, this model also encourages students to collaborate, communicate effectively, and develop metacognitive skills in monitoring their own learning process.

Previous research has also demonstrated the effectiveness of the inductive thinking model in improving the quality of learning. For instance, a study by Trianto (2010) revealed that the implementation of the inductive thinking model was able to increase students' motivation, conceptual understanding, and learning outcomes. Similarly, Arends (2012) emphasized that inductive strategies encourage student involvement in independently discovering concepts, making learning more meaningful.

Considering both empirical conditions in the field and theoretical perspectives, the application of the inductive thinking model is seen as relevant to addressing the low level of student learning activity at MTs. Addinul Qayyim Kapek. Through this model, students are not only expected to understand Biology subject matter conceptually but also trained to develop critical thinking skills, collaborate in groups, and connect learning with real-life situations. Therefore, this study aims to examine the implementation of the inductive thinking model in enhancing student learning activities, particularly in the Grade VII Biology subject.

METHOD

Classroom Action Research (CAR). Classroom action research is a form of action research that is reflective and collaborative in nature, conducted with the aim of improving the quality of classroom learning practices (Sudijono, 2012). Classroom action research consists of four stages, namely: (1) planning, (2) implementation, (3) observation, and (4) reflection. After conducting reflection, which includes analysis, synthesis, and evaluation of the observation results regarding the process and outcomes of the actions taken, problems or ideas for improvement usually arise. Therefore, it is necessary to carry out replanning, reimplementation, reobservation, and rereflection.

The research was conducted at MTs. Addinul Qayyim Kapek. The subjects of the research were the seventh-grade students of MTs. Addinul Qayyim Kapek, West Lombok Regency. The object of the research was the application of the inductive thinking learning model to improve students' cognitive learning outcomes in science (biology). The data collection technique was carried out by observing every ongoing event and recording it using observation tools related to the aspects being studied. Observation in this study aimed to assess both teacher performance and students' activities during the learning process using the inductive thinking model. Student observation was conducted to monitor students' learning activities in order to obtain data on their performance during teaching and learning activities (Suprijono, 2012). The assessment format used was a checklist. Thus, in filling out the student performance assessment, the observer only gave a check mark (√) in the appropriate column during the learning process. The collected data were analyzed qualitatively in a descriptive manner, presenting the data in narrative form along with a discussion based on the research findings (Mukti & Julianto, 2018).

RESULTS AND DISCUSSION

This classroom action research (CAR), conducted in two cycles, aimed to enhance both teacher and student learning activities through the application of the inductive thinking model. CAR has been recognized as an effective approach to improving teaching practices because it is implemented through iterative cycles of planning, implementation, observation, and reflection (Kemmis & McTaggart, 1988). In this regard, teachers assume a dual role: not only as instructors but also as researchers who critically reflect on their own practice to achieve continuous instructional improvement (Schön, 1983).

Teacher Activity

The observation results revealed a significant improvement in teacher activity between cycles I and II. In cycle I, the level of teacher engagement was categorized as moderately active, with a completion rate of 59.37%. By cycle II, this percentage increased to 78.12%, falling into the active category. These results demonstrate that the adjustments in teaching strategies implemented during cycle II positively influenced classroom management and interaction quality.

The relatively low teacher activity in cycle I was primarily attributable to limited classroom management skills and insufficient provision of motivation and appreciation to students. As Hamalik (2018) emphasizes, effective classroom management is a key determinant in creating a conducive learning environment. Teachers who fail to provide adequate positive reinforcement often struggle to optimize student potential. To address these shortcomings, improvements in cycle II included providing greater motivation, recognition, and more structured classroom management strategies. The teacher adopted a more interactive approach, such as incorporating group discussions and question-and-answer sessions, which resulted in increased teacher engagement and, subsequently, higher student participation.

Student Activity

The findings also indicated an increase in student activity from cycle I to cycle II. In cycle I, student participation reached only 47.05%, categorized as moderately active. In cycle II, this rose to 64.70%, categorized as active. This improvement illustrates that the teacher's enhanced instructional strategies had a direct impact on student engagement.

Student participation is strongly influenced by the teaching methods and pedagogical approaches employed by the teacher. Joyce, Weil, and Calhoun (2015) argue that the inductive learning model can foster critical thinking and greater student involvement, as it encourages learners to discover concepts through experiential learning. Therefore, the increase in student activity during cycle II was a logical outcome of employing more interactive and student-centered teaching methods.

The relatively low student engagement in cycle I can be attributed to limited instructional variation and teacher-centered delivery. These factors resulted in passive student behavior and a lack of motivation to participate. In cycle II, the teacher addressed these issues by offering more opportunities for interaction, questioning, and expressing opinions, while also providing greater appreciation for student contributions. This aligns with Vygotsky's (1978) socio-cultural theory, which highlights the role of social interaction in knowledge construction through the zone of proximal development.

Implications of Findings

The improvements observed in cycle II demonstrate that corrective actions were well aligned with classroom needs. The teacher not only refined instructional strategies but also improved communication with students, which is essential for creating active, collaborative, and meaningful learning (Slavin, 2018). Nevertheless, despite these gains, student activity in cycle II reached only 64.70%, indicating that approximately 35% of students remained less engaged. This suggests the necessity of further innovation, such as integrating technology-based learning media or cooperative learning methods (Johnson & Johnson, 2009).

The teacher's increased activity, from 59.37% to 78.12%, also illustrates the capacity for professional reflection, a core component of teacher professionalism. Schön (1983) underscores that reflective practice is fundamental to improving professional competence. The consistent pattern observed—where improvements in teacher activity correspond with increased student activity—reinforces the notion that learning quality is heavily influenced by the quality of teacher-student interactions (Arends, 2012).

Furthermore, the successful outcomes of cycle II can be attributed to the inductive thinking model, which empowers students to construct knowledge independently. This model encourages learners to derive general principles from specific experiences, thereby enhancing engagement and comprehension (Eggen & Kauchak, 2012). Prior studies corroborate these findings, showing that inductive teaching models enhance motivation and student involvement (Suyono & Hariyanto, 2017).

The role of intrinsic motivation should also be highlighted. Deci and Ryan (2000) argue that students' motivation increases when they feel valued and are provided with opportunities for meaningful participation. The provision of more recognition and appreciation in cycle II likely contributed to the rise in student motivation and activity. Similarly, the classroom environment played a crucial role, as a more conducive setting facilitated greater teacher-student interaction, consistent with Bronfenbrenner's (1979) ecological systems theory.

Broader Significance

The findings further suggest that improvements in teacher and student activity contribute positively to learning outcomes overall. According to Bloom (1984), high levels of learning activity are a prerequisite for achieving optimal learning outcomes. Importantly, learning success should not only be measured by final grades but also by the process itself. Increased student activity reflects more meaningful and constructivist learning, where students actively construct knowledge rather than passively receive it (Piaget, 1970).

In conclusion, the application of the inductive thinking model across two CAR cycles successfully enhanced both teacher and student activities. Despite these improvements, student participation rates in cycle II indicate that further innovations remain necessary. These findings underscore the importance of ongoing reflection and the development of adaptive teaching strategies. The study not only provides empirical support for the inductive learning model but also highlights the iterative nature of CAR as a powerful tool for continuous instructional improvement.

CONCLUSION

The classroom action research, conducted in two cycles through the implementation of the inductive thinking model, demonstrated a substantial improvement in both teacher and student activities. In the first cycle, teacher activity achieved a completeness percentage of 59.37%, categorized as “moderately active.” In the second cycle, this figure increased to 78.12%, falling into the “active” category. These findings suggest that teachers were able to engage in reflection and refine their instructional strategies, thereby enhancing their competencies in classroom management, motivation, and the recognition of student achievements.

A parallel trend was also observed in student activities. In the first cycle, student activity recorded a completeness percentage of only 47.05%, categorized as “moderately active.” However, in the second cycle, this percentage rose to 64.70%, categorized as “active.” This progression indicates that the implementation of the inductive thinking model positively influenced student engagement in the learning process. Students became more participatory, interactive, and willing to articulate their opinions following the refinement of instructional strategies by the teacher.

Taken together, the results of this study provide empirical evidence that the application of the inductive thinking model in instructional settings can enhance the quality of both teaching and learning activities. This model fosters opportunities for students to develop critical thinking skills and construct understanding through direct experiences. Simultaneously, it encourages teachers to adopt a more reflective and adaptive stance in designing interactive and meaningful learning environments.

Accordingly, this research underscores that the use of the inductive thinking model in classroom instruction can serve as an effective pedagogical alternative to promote active engagement among teachers and students. Although the outcomes of the second cycle reveal notable improvements, the percentage of student activity completeness still demonstrates potential for further enhancement. Therefore, teachers are advised to continuously innovate by employing more diverse instructional strategies and integrating appropriate media and methods tailored to the characteristics of students, in order to optimize learning activities to their fullest potential.

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