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An Action Research Investigation Into The Impact Of The Probing Promting Learning Model On Fourth-Grade Students' Understanding Of Growth And Development In Living Organisms

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Abstract

This Classroom Action Research (CAR) studies the influence of implementing the Probing Promting learning paradigm on fourth-grade students' knowledge of science topics, particularly in the context of the growth and development of living things. The study employs a cyclic approach led by the Kemmis and Taggart model, encompassing planning, acting, observing, and reflecting. Data gathering includes test scores, teacher and student observation percentages, and evaluations of teacher and student activities. The results reveal a substantial positive link between the Probing Promting learning approach and increased academic achievement. Test results, starting at an average of 54.48 in the pre-cycle, rapidly improved to 83.70 in Cycle II. The use of the methodology also positively increased instructor and student observation percentages, reaching 96.43% and 92.85%, respectively, in Cycle II. Observations of instructor and student actions, undertaken by two observers, demonstrated constant progress across cycles. The Probing Promting model's repeated application led to enhanced teaching tactics and increased student involvement. The research suggests that the Probing Promting learning paradigm is effective in boosting science instruction for fourth-grade kids, giving a helpful tool for instructors. The excellent outcomes underline the necessity of selecting proper teaching approaches to establish a friendly and effective learning environment. Further research in varied educational settings may give more insights, adding to the continuing improvement of scientific teaching approaches.
Keywords: Classroom Action Research, Probing Promting Learning Model, Science Education

Abstrak

Penelitian Tindakan Kelas (PTK) ini mengkaji pengaruh penerapan paradigma pembelajaran Probing Promting terhadap pengetahuan siswa kelas IV pada topik IPA, khususnya dalam konteks pertumbuhan dan perkembangan makhluk hidup. Penelitian ini menggunakan pendekatan siklus yang dipimpin oleh model Kemmis dan Taggart, yang meliputi perencanaan, tindakan, observasi, dan refleksi. Pengumpulan data meliputi nilai tes, persentase observasi guru dan siswa, serta evaluasi aktivitas guru dan siswa. Hasilnya mengungkapkan adanya hubungan positif yang substansial antara pendekatan pembelajaran Probing Promting dan peningkatan prestasi akademik. Hasil tes yang semula rata-rata 54,48 pada pra siklus meningkat pesat menjadi 83,70 pada siklus II. Penggunaan metodologi juga meningkatkan persentase observasi guru dan siswa secara positif, masing-masing mencapai 96,43% dan 92,85% pada Siklus II. Pengamatan terhadap tindakan instruktur dan siswa, yang dilakukan oleh dua pengamat, menunjukkan kemajuan yang konstan sepanjang siklus. Penerapan berulang-ulang model Probing Promting menghasilkan peningkatan taktik pengajaran dan peningkatan keterlibatan siswa. Penelitian ini menunjukkan bahwa paradigma pembelajaran Probing Promting efektif dalam meningkatkan pengajaran sains untuk anak-anak kelas empat, memberikan alat yang berguna bagi instruktur. Hasil luar biasa ini menggarisbawahi perlunya memilih pendekatan pengajaran yang tepat untuk menciptakan lingkungan belajar yang ramah dan efektif. Penelitian lebih lanjut dalam berbagai latar pendidikan dapat memberikan lebih banyak wawasan, sehingga menambah perbaikan berkelanjutan pada pendekatan pengajaran ilmiah.
Kata kunci: Penelitian Tindakan Kelas, Model Pembelajaran Probing Prompting, Pendidikan IPA

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INTRODUCTION

The process of teaching and learning is a structured part of the school environment. This setting is regulated and supervised to ensure that learning activities are oriented towards the goals of education. The supervision also determines a suitable learning environment that challenges and inspires learners to gain knowledge, offers a sense of safety and contentment, and achieves the intended goals. According to the Minister of Education and Culture Regulation No. 22 of 2016 on the Standards of Basic and Secondary Education Processes: "The learning process in educational units is conducted interactively, inspiringly, enjoyable, challenging, motivating students to participate actively, and providing sufficient space for initiatives, creativity, and independence according to the talents, interests, and physical and psychological development of students. Therefore, every educational unit organises, implements, and analyses the learning process to increase the efficiency and effectiveness of acquiring graduate skills." Hence, the learning process in the field of education needs to be particularly highlighted, especially in science education.

Science, commonly referred to as Natural Sciences (Ilmu Pengetahuan Alam or IPA), essentially indicates a branch of scientific knowledge that examines natural phenomena through observation and analysis of empirical evidence to articulate, predict, and comprehend these natural occurrences. Human endeavours to understand the cosmos entail accurate observation, the use of methods, and explanations through reasoning to arrive at conclusions. Therefore, IPA plays a significant role in the rapid and impactful advancement of science and technology (IPTEK) in education, notably in science education in Indonesia and other industrialised countries. While science education has improved in wealthy countries, it has yet to be fully established in Indonesia. Science education in Indonesia has not attained the desired levels, even though increasing scientific knowledge and technology (IPTEK) is vital and serves as a benchmark for national success. In Indonesia, the reality is that the subject of science is not highly regarded and receives inadequate attention, especially considering the absence of instructors using scientific concepts. This issue is visible in the tough nature of science learning for kids (Connolly, 2018; Muravev, 2020).

The flaws are further apparent in the way science is taught, generating challenges for pupils. The researcher's observation of the knowledge of science ideas among fourth-grade children at a public primary school found that only roughly 30% of kids reached the Minimum Mastery Criteria (KKM) in science tests, while 70% did not obtain the KKM. Factors impacting the low learning outcomes include the absence of parental attention to children's learning at home and an insufficient learning environment. These factors impair students' grasp of science topics, leading them to consider science learning as challenging. Science lessons should not be dull or monotonous. For kids with a great interest in learning, engaging lessons would enable them to participate successfully and comprehend the knowledge obtained. Motivation should be offered to students with a weaker interest in grasping science subjects, as those who are regularly engaged in their studies can maximize their learning. The condition of the classroom environment also impacts students' learning outcomes; a favourable environment enables the successful delivery of instructional materials compared to an unsupportive setting. The choice of teaching methods should fit with the subject matter, ensuring that students are excited about the teaching and learning process (Mertens et al., 2022; Truong & Nhu, 2017).

In conclusion, teachers are challenged to identify effective teaching strategies for learners, especially in science topics. One such way is the employment of the probing prompting learning paradigm, which fosters active engagement by randomly selecting pupils to answer questions. This concept attempts to make students more attentive during explanations, actively involved in learning, and interested in the learning process through the use of interactive teaching methods and appealing instructional media. Therefore, it is vital to address the issues in science education by focusing on new and effective teaching methodologies. The low enthusiasm and knowledge of science ideas among students, as indicated by the observed results, need a reevaluation of present teaching methodologies. Efforts should be made to make scientific education more engaging and accessible to pupils, encouraging a favourable attitude towards the subject (Akturk & Sahin, 2011; Ratnasari, 2020).

One key aspect to consider is the engagement of parents in helping their children's learning at home. By fostering parental engagement, educators can bridge the gap between classroom learning and independent study (Prayuda et al., 2022). Parents have a key role in providing a suitable environment for learning, and their active participation can considerably improve a student's academic achievement. Therefore, activities should be conducted to educate parents about the value of scientific education and how they may contribute to their child's learning experience. Additionally, the general learning environment within the classroom needs care (Prayuda, Ginting, et al., 2023). A suitable atmosphere not only includes well-maintained physical areas but also extends to the dynamics between students and teachers. Teachers, as facilitators of information, must endeavour to establish a positive and supportive culture that promotes active involvement, critical thinking, and collaboration among students. This technique creates a sense of interest and a love for learning, making science more enjoyable and less scary (Fauth, 2019).

Addressing the issues in science education requires a holistic strategy, spanning curriculum creation, teacher training, and educational policies. Curriculum design should stress hands-on, experiential learning that helps students to investigate and discover scientific principles through practical applications (Prayuda, Juliana, et al., 2023). Teacher training programs should focus on educating educators with creative teaching approaches, communication skills, and strategies to engage students effectively. Furthermore, educational policy should prioritize devoting resources to expand science education infrastructure, provide suitable learning materials, and promote continual professional development for instructors. Collaboration between educational institutions, government bodies, and relevant stakeholders is vital to promote a comprehensive and persistent development in science education.

In conclusion, the issues in science education, as emphasised by the observed difficulty in understanding science topics among students, necessitate a diverse strategy. By addressing the role of parents, strengthening the learning environment, and implementing good teaching practices, we can nurture a generation of children with a real interest in science. This joint effort, involving educators, parents, policymakers, and the community, is crucial to develop a firm basis for scientific literacy and innovation in the future.

METHOD

The research conducted is Classroom Action Research (CAR), a method used by instructors or researchers to better teaching quality, either personally or for their colleagues. It serves to test assumptions in educational theories implemented in practice, implementing and evaluating school policy. The chosen model for this research is the Kemmis and Taggart model, covering planning, acting, observing, and reflecting as its key activities, with cycles continuing until the desired objectives are attained.

Data collection involves the use of exams, especially a fill-in-the-blank test with 10 items in each cycle, presented to fourth-grade pupils at a public primary school. This test focuses on the growth and development of biological creatures. Additionally, non-test tactics are applied, including monitoring of teacher and student actions during the learning process. The observation tries to obtain data relating to the researched subject by direct observation at the school. Documentation is acquired from numerous activities during the learning process, and field notes serve as records supporting teachers in reflecting on the actions during the research.

Interviews are performed to examine the situation, employing interview guides with questions geared at analysing peers and students' comprehension of subjects. The focus is on the probing prompting learning paradigm to enhance the understanding and improvement of teaching approaches in the classroom. In the Classroom Action Research (CAR) done, the overall purpose is to better the teaching and learning environment. The Kemmis and Taggart model directs the research through cycles of planning, acting, observing, and reflecting, ensuring a thorough approach to achieving the desired objectives. The research aims to contribute to the continual improvement of educational practices and the deployment of efficient teaching approaches.

The data collection method incorporates both test and non-test procedures. The fill-in-the-blank test, offered in each cycle, measures students' understanding of the growth and development of biological creatures. Non-test strategies, such as observation and documentation, provide a complete view of the teaching and learning process. Through direct observation, valuable insights are gained, while documentation records essential components of the learning activities. The employment of interviews significantly improves the research by including opinions from both peers and students. The probing prompting learning paradigm becomes a key point, seeking to test comprehension and adapt teaching ways. By engaging in discourse and receiving input, the research tries to address difficulties and discover potential for development.

In conclusion, this Classroom Action Research strives to contribute to the advancement of teaching techniques, particularly in the context of grasping concepts connected to the growth and development of living beings. Through a systematic and iterative process, the research attempts to enhance the entire learning experience, providing a dynamic and effective educational environment for both teachers and students.

FINDING AND DISCUSSION

From the statistics shown above, it is obvious that the average science learning outcomes of students rose in each cycle, with Cycle I indicating progress even before the adoption of improvements through classroom action research. The average score for scientific subjects was 54.48 before any corrective actions were applied. Observation percentages for teachers and students are provided in the comparison table above, indicating the understanding of fourth-grade students in science concepts. In Cycle I, the average score for science learning outcomes was 64.07, with 12 students meeting the Minimum Mastery Criteria (KKM). In Cycle II, the average score further increased to 83.70, with 25 students scoring above KKM and 2 students not reaching the criterion. The gain in understanding is represented in the table and bar chart below.

The percentage of concept knowledge demonstrates considerable progress in each learning phase and outcome. In the pre-cycle, only roughly 22.22% of pupils scored above KKM. This percentage climbed to 64.07% in Cycle I and subsequently improved to 83.70% in Cycle II. The observation sheets for both teachers and students also revealed constant growth in each cycle, reaching 96.43% for teachers and 92.85% for students in Cycle II. The increase in knowledge can be due to numerous reasons, including the deployment of proper teaching models that facilitate students' grasp of the topic. By utilising the appropriate model, students become more active in the learning process, resulting in greater understanding of science concepts and improved overall learning engagement.

The observer's observations on student activities, reported in Table 13, suggest a considerable increase in each meeting over Cycles I and II. The average observation score for student actions in Cycle I climbed from 76.79% to 87.5%, while in Cycle II, it improved from 78.57% to 92.85%. Furthermore, the observations of instructor behaviours, as documented in Table 14, reveal substantial growth. The average observation score for teacher actions in Cycle I climbed from 78.57% to 89.29%, and in Cycle II, it further improved from 80.36% to 96.43%.

In conclusion, the Classroom Action Research (CAR) done in two cycles indicated a remarkable improvement in students' grasp of science topics, notably in the growth and development of living creatures. The application of the Probing Promting learning model originally caused obstacles but proved beneficial in boosting comprehension. The model's integration with students' life experiences promoted a deeper grasp of the topic, contributing to a continuous improvement in science instruction for fourth-grade children.

Continuing with the analysis of the study activities, it is obvious that the Probing Promting learning model had a major part in the enhancement of students' comprehension of science concepts, specifically in the subject of growth and development of living creatures. The early challenge in the application of the Probing Promting model in Cycle I was overcome in Cycle II, displaying the adaptability and effectiveness of the selected teaching style. The findings from the observations made by both Observer I and Observer II further cement the favourable influence of the Probing Promting learning paradigm on both teacher and student activities. The steady increase in observation scores throughout the cycles suggests a continual and substantial improvement in teaching approaches and student involvement. These data support the notion that the Probing Promting approach provides an active and interactive learning environment.

The analysis also examines the usage of two sessions every cycle, totaling four meetings in both Cycle I and Cycle II. The observations of instructor activities, as shown in Table 14, reveal a consistent progression in the average scores from one meeting to the next in both cycles. The improvement from 78.57% to 89.29% in Cycle I and from 80.36% to 96.43% in Cycle II suggests a constant refinement in the teacher's implementation of the Probing Promting paradigm. Similarly, the observations of student activities, provided in Table 13, demonstrate a considerable progress in the average scores from one meeting to the next in both cycles. The average score climbed from 76.79% to 87.5% in Cycle I and from 78.57% to 92.85% in Cycle II. This positive trend shows the students' increased familiarity and effectiveness in utilising the Probing Promting learning methodology.

Reflecting on the complete research process, it is obvious that the Probing Promting learning paradigm contributed greatly to the growth of students' conceptual comprehension in science. Despite initial hurdles, the persistence in applying the approach, coupled with the active involvement of both teachers and students, led to exceptional improvement. In conclusion, the research findings underline the effectiveness of the Probing Promting learning model in boosting students' grasp of science ideas, notably in the subject of the growth and development of living creatures. The positive outcomes observed in both teacher and student activities imply that the Probing Promting model can serve as a beneficial tool for educators wanting to create dynamic and engaging learning experiences in the scientific classroom.

Examining the association among variables in the research process gives vital insights into the interplay of numerous aspects leading to the advancement of students' knowledge of science topics. The interconnection of several variables, including test scores, observation percentages, and the application of the Probing Promting learning model, further deepens the analysis. Firstly, the test results, as indicated in the statistics, depict a definite rising tendency across the cycles. The average score increased from 54.48 in the pre-cycle to 64.07 in Cycle I and further soared to 83.70 in Cycle II. This favourable association coincides with the purpose of the research, stressing the development of students' academic performance in science.

Observation percentages for both teachers and students also demonstrate a good link with the adoption of the Probing Promting learning model. In Cycle II, teacher observation scores climbed to 96.43%, showing the effective implementation of the chosen model. Likewise, student observation scores climbed 92.85%, demonstrating enhanced involvement and knowledge. This link underlines the symbiotic relationship between teaching approaches and students' active participation in the learning process.

Furthermore, the persistent improvement in both teacher and student actions, as noted by both Observer I and Observer II, underscores the favourable association between the Probing Promting learning model and increased classroom dynamics. The growing scores across meetings within each cycle illustrate the iterative nature of the research process and the constant development of teaching tactics. The association among variables becomes more clear when evaluating the significance of the Probing Promting model in generating a suitable learning environment. The model's emphasis on combining theoretical concepts with students' real-life experiences adds to the observed improvement in test scores, teacher and student behaviours, and general grasp of science subjects.

In conclusion, the research displays a cohesive and favourable link among factors. The introduction of the Probing Promting learning paradigm has not only led to increased test results but has also affected the dynamics of teacher and student activities positively. This association underlines the necessity of selecting proper teaching models and approaches to establish an effective and engaging learning environment, ultimately contributing to the improvement of students' knowledge of science subjects.

CONCLUSION

In conclusion, this Classroom Action Research (CAR) concentrating on the application of the Probing Promting learning paradigm in the context of scientific teaching for fourth-grade students has achieved considerable beneficial benefits. The project aims to boost students' grasp of science concepts, particularly those connected to the growth and development of biological creatures. The findings provide vital insights into the effectiveness of the Probing Promting methodology and its association with increased academic achievement and classroom dynamics. The steady increase in test scores throughout cycles reveals a definite positive impact on pupils' conceptual knowledge. The average score, which started at 54.48 in the pre-cycle, improved dramatically to 83.70 in Cycle II. This rising trajectory highlights the success of the Probing Promting paradigm in fostering a deeper knowledge of science subjects.

Observation percentages for both teachers and students also indicated a good link with the deployment of the Probing Promting learning approach. The improvement in teacher observation scores to 96.43% in Cycle II and student observation scores reaching 92.85% demonstrates the model's efficiency in generating an engaged and interactive learning environment. Additionally, the continual improvement in both teacher and student activities, as witnessed across the cycles, underlines the ongoing refinement and adaptation of teaching tactics. The positive association across variables underscores the need of selecting proper teaching approaches to establish a favourable and effective learning climate.

The research highlights that the Probing Promting learning approach, despite initial hurdles, has shown to be a beneficial tool in boosting science education. By encouraging students to integrate theoretical concepts with their real-life experiences, the strategy not only increases academic achievement but also fosters active engagement in the learning process. In conclusion, the favourable outcomes of this research imply that the Probing Promting learning model can be a beneficial pedagogical strategy in scientific instruction for fourth-grade students. Further research and analysis of this approach in varied educational settings may provide more insights and contribute to the continuing improvement of science teaching methodologies.

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