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IMPLEMENTATION OF THE READ, ANSWER, DISCUSS, EXPLAIN, AND CREATE (RADEC) LEARNING MODEL IN MATHEMATICS IN GRADE IV ELEMENTARY SCHOOL

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Abstract

This study investigates the implementation of the Read, Answer, Discuss, Explain, and Create (RADEC) learning model in Grade IV Mathematics instruction and identifies the supporting and inhibiting factors influencing its application. The research is motivated by the low levels of student participation and critical thinking in Mathematics learning, which remains heavily reliant on lecture-based methods. The RADEC model was selected for its emphasis on active, collaborative learning and its alignment with 21st-century skill development. Employing a descriptive qualitative approach, data were collected through classroom observations, interviews with teachers and students, and documentation of learning activities. The implementation process follows five core stages: reading, answering, group discussion, explanation, and creative tasks. Key supporting factors include well-prepared teaching materials, teacher competence, student readiness, increased student engagement, and enhanced self-confidence. In contrast, inhibiting factors comprise limited instructional time, student difficulties during discussions, and challenges in understanding mathematical symbols. Additionally, some students perceived the model as overly serious and time-consuming. The study concludes that while the RADEC model positively influences student engagement and learning outcomes, its success depends on effective time management and adaptive teaching strategies that address students' cognitive and emotional needs.

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Keywords: RADEC; Mathematics Learning; Student Engagement; Qualitative Research; Elementary Education

INTRODUCTION

Education plays a crucial role in shaping civilization and developing the character of the nation's next generation. It is in line with Law Number 20 of 2003 concerning the National Education System, which states that "Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual and religious strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, the nation, and the state." (*UU Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional Pasal 3*, 2003). Thus, education is not just a process of transferring knowledge but a comprehensive development process involving intellectual, spiritual, social, and emotional aspects (Majdi & Ichsan, 2021).

Education plays a crucial role in human civilization's general development and advancement, including Islamic civilization. History demonstrates that the success of the Muslim community is inseparable from the role of education as a primary pillar in shaping its people's character and intellectual abilities. In the Quran, education is a fundamental process that begins with the command to read (Iqra'), demonstrating the urgency of knowledge and learning in Islam (Imamuddin et al., 2020). Great figures in Islamic education, such as Al-Farabi, Ibn Sina, Ibn Khaldun, and Al-Ghazali, have made monumental contributions to developing knowledge and forming personality through moral and ethical values based on Islamic teachings. The advancement of knowledge and spiritual values merged through educational institutions such as madrasas and early Islamic universities, creating an advanced and civilized civilization (Tabroni et al., 2022). Islamic education focuses on academic aspects and the formation of individual morals and character, which is the foundation for building a just and civilized society (Arifin & Ichsan, 2024).

In general, education in Islam is a systematic effort to develop individual potential as a whole, which includes cognitive, affective, and psychomotor aspects by adhering to the moral principles of the Qur'an as well as mastery of knowledge and life skills (Nurjadid

et al., 2025). Teachers, as the spearhead of education, play an important role in realizing this vision, so understanding the definition and philosophy of education is the main foundation, so that education can survive and develop in accordance with the social and cultural dynamics of students, especially in Indonesia, which has the challenge of diversity (Kuswanto, 2014). Islamic education is aimed at transferring knowledge and cultivating noble morals so that students can carry out the functions of caliphs on earth who bring happiness in this world and the hereafter (Arianti, 2018). The importance of synergy between formal education and da'wah values is an effective strategy in strengthening religious identity and sustainable civilization values.

The initial education process has been determined in the Qur'an, as contained in the QS. Al-Alaq: 1-5: "Read with (mentioning) the name of your Lord who created, He has created man from a clot of blood. Read, and your Lord is the Most Gracious, Who teaches (humans) by means of *kalam* (pen), Diqa teaches humans what they do not know*"* (Kemenag RI, 2019).

Ibnu Katsir thinks that Surah al-'Alaq verses 1 to 5 are Allah's treatise, which addresses the beginning of His love and mercy towards His people, as well as a tanbih (warning) regarding the initial phase of human creation from beginning to end. This verse shows that education is a direct command from Allah and is the basis of a learning process that continues to develop. Apart from that, the importance of knowledge is also strengthened in the word of Allah: Surah Al-'Alaq, verses 1–5, is the first revelation revealed to the Prophet Muhammad SAW, which contains a deep message regarding the importance of knowledge in Islam (Katsir, 2014).

Education is a lifelong learning experience in environments and situations that positively influence individuals. Education is the beginning of forming a student's character and personality, which serves as a cognitive and social foundation that will affect their future development. Therefore, elementary school education quality significantly impacts students' overall development (Hasanah et al., 2024). Apart from the quality of education, students' social interactions must also be considered, such as communication and cooperation between students, or between students and teachers, which will help develop students' activeness (Ichsan, 2019). A teacher must adapt the learning model to the needs of their students. It will ensure a more active learning process. One factor influencing a teacher's success in imparting knowledge to students is the teacher's choice of an

appropriate learning model. Learning models help teachers develop teaching materials to communicate with students. It is important for final assessments, allowing teachers to see the completion of learning activities. Furthermore, there is minimal social interaction and collaboration among students, as well as a lack of skills in speaking and reading. It certainly impacts student development (Hamruni, 2019).

A learning model can describe learning procedures, environment, and other tools systematically arranged to illustrate a step-by-step learning activity. A learning model is formed when approaches, strategies, methods, techniques, and tactics are integrated into a unified whole. The concept of a learning model is becoming more general, stating that learning models are designed for specific purposes, including teaching information concepts, ways of thinking, and studying social values (Khoerunnisa & Aqwal, 2020). Thus, learning models have a function that can be used to realize learning objectives. When selecting a model, the learning objectives must be considered. The term "learning model" aligns with the term "teaching model," in that the latter focuses more on how teachers help students learn, while the term "learning model" focuses more on how students learn. Therefore, when teachers help students learn, they also help them learn (Amin, 2018).

In the learning process, it is necessary to pay attention to the lack of innovation in learning approaches that only focus on teachers, which results in low active participation for students. Many students cannot relate the learning material to real life, so they feel that learning at school is irrelevant to their needs outside the classroom (Karina et al., 2024). The results of the researcher's initial observations in the field related to the use of the RADEC learning model showed that the fourth-grade teacher conducted a learning process with students who used the Read, Answer, Discuss, Explain, and Create (RADEC) learning model in the fourth grade of Elementary School in the Mathematics subjects. Seeing the ongoing learning process, the author was interested in knowing more deeply about the ongoing learning process, and seeing the condition of the classroom at that time, which looked active and received stimuli and responses that were not just like the usual learning process that focuses on one direction only or focuses on the teacher only. The learning applied in the classroom plays a large role in shaping students' learning experiences and how they access knowledge. Using the RADEC learning model can help students develop learning skills by utilizing the RADEC model; students not only gain a good understanding of the subject matter, but also hone thinking skills for future professional needs (Handayani et al., 2019). Effective learning must involve students in interacting during the learning

process because, currently, students are required to build their own knowledge.

Previous research has shown that the RADEC (Read, Answer, Discuss, Explain, and Create) learning model effectively improves elementary school students' mathematics learning outcomes. Applying the RADEC model to fifth-grade students at SDN 194 Pekanbaru significantly improved creativity and mathematics learning outcomes compared to conventional learning methods (Ramadhani et al., 2023). Furthermore, research at SDN 02 Sitiung reported increased students' mathematical communication skills through RADEC learning in two cycles of classroom action learning (Afifah & Arlina, 2024). Another study by Utami and Harahap (2025) added that integrating the RADEC model with digital learning media in Wordwall can strengthen the understanding of mathematical concepts and increase student engagement interactively. Wardani dan Munir (2024) also found that consistently using the RADEC model improved students' critical thinking and problem-solving skills. Overall, these findings confirm that RADEC is an innovative learning model suitable for enhancing mathematics learning at the elementary level by facilitating active, collaborative, and creative learning activities.

METHODS

This research uses a descriptive qualitative research approach according to the definition from Moleong (2018), which states that a qualitative study aims to understand phenomena in a natural social context in depth. The research location was an elementary school, where the author conducted teaching practice as part of a college assignment. During this activity, the authors observed a mathematics class teacher's implementation of the RADEC learning model. This observation sparked interest in further researching how implementing the RADEC learning model can be applied effectively to mathematics and other subjects, considering the more conducive classroom conditions based on the author's experience during the observation.

In data analysis, authors use the interactive analysis model from Miles and Huberman, which consists of three main stages: Data Reduction, Data Display, and Verification (Sugiyono, 2016). The data reduction stage is carried out to select and focus relevant data to simplify and organize the analysis. Next, the reduced data is presented in an easily understood format, such as a table, diagram, or narrative. Finally, conclusions are drawn and verified to ensure the validity of the findings and systematically link the analysis

results to the research objectives.

RESULTS

Implementation of the RADEC Learning Model

Based on the analysis, the fourth-grade elementary school teacher has effectively implemented the RADEC learning model in mathematics. Before starting the lesson, the teacher prepares the teaching module and prepares herself thoroughly, as a positive attitude greatly influences students' learning interest. A pleasant teacher and engaging delivery methods can increase students' interest in participating in the learning process. Furthermore, researchers observed that the teacher provides systematic guidance to students according to the stages of the RADEC learning model, so that learning proceeds in a structured and objective manner.

The implementation of the RADEC learning model in mathematics is also evident through observations of fourth-grade students and student responses to questions posed by the researcher. Before the learning process begins, the teacher conducts preliminary activities such as greetings, checking attendance, and preparing students' physical and psychological conditions. Hence, they are ready to participate in the learning process. Next, the teacher conducts apperception by linking the new material to the students' experiences in previous material. In addition, the teacher motivates students regarding the benefits of learning and provides clear guidance for implementing learning activities so that students are more focused and directed throughout the process.

Based on the researcher's observations, students' responses to the "Read" stage in the RADEC learning model demonstrated a high level of enthusiasm for reading as a starting point before in-depth learning begins. In this "Read" stage, students who previously only read books began to read more frequently, improving their reading fluency. It provided an important foundation for students to understand further the material they would study.

In the Answer stage, a stimulus-response interaction occurs between students and the teacher after the reading process. In this activity, the teacher asks questions related to the content of the book the students have read. If a student cannot answer correctly, the teacher will provide explanations and encouragement so that the student can pay closer attention to the material they have read. However, some students experience tension during

the Answer stage, making it difficult to understand the material and fearing that their answers will not meet expectations.

Based on the observations, the researchers conclude that in the Discussion stage, the teacher plays a crucial role in fostering social interaction among students to exchange thoughts and ideas, thereby creating a sense of togetherness within the group. It allows students who may feel shy or reluctant to ask the teacher directly to raise their questions with their peers in the group. According to student feedback, the discussion phase in the RADEC learning model is very useful and enjoyable because it provides opportunities for students to share opinions, assist classmates who have not yet understood the material, and deepen their understanding through collective reflection.

This discussion also encourages students to develop confidence in expressing their opinions while improving communication and teamwork skills. The discussion process makes the learning environment more active and interactive, preventing boredom in the classroom and significantly increasing student engagement and comprehension. In such a conducive atmosphere, students become more motivated to learn and actively participate in the learning process.

In the Explain stage, fourth-grade elementary school students are trained to think critically, learn independently, collaborate, and communicate by presenting the results of their discussions in front of the class. This stage provides an active and meaningful learning experience as students must thoroughly understand the material to deliver clear and effective explanations. This process not only trains public speaking skills but also fosters courage and self-confidence among students.

Moreover, listening to peer explanations offers new perspectives that enrich students' individual understanding. The learning process involving all students at the Explain stage creates a dynamic, interactive, and engaging learning atmosphere. Consequently, the learning becomes more enjoyable and effective in enhancing students' knowledge and skills.

Based on the above observations, at the Creation stage, students exhibit high enthusiasm through the hands-on activities taught by the teacher, which makes the learning environment more active and fosters meaningful learning experiences. However, students face time management challenges because some stages of the RADEC learning model do not fully align with the available time allocation. Through the RADEC learning

model, students become more active in the classroom. Additionally, students who lack the confidence to ask questions directly to the teacher in front of the class can ask their peers during the discussion stage (Hanum et al., 2023).

Student engagement in learning activities requires adequate time for implementation to ensure the learning process runs optimally. In this context, the teacher's role is more focused on being a facilitator who guides and supports the mathematics learning process in the fourth-grade classroom, allowing students to learn independently and collaboratively in a conducive environment.

DISCUSSION

Supporting Factors of the RADEC Learning Model in Mathematics Subjects

Supporting factors in implementing the RADEC learning model (Read, Answer, Discuss, Explain, Create) in mathematics play a crucial role in determining the success of the teaching and learning process. One of the primary factors is the availability of relevant and well-structured learning materials. Learning materials designed according to the stages of the RADEC model greatly assist students in gradually understanding mathematical concepts, starting from reading and comprehending the material, answering questions, and creating based on their understanding. Additionally, the teacher's competence is critical in implementing this model.

Teachers who deeply understand the RADEC model steps and can design appropriate learning activities will be more effective in managing the classroom and facilitating an active and meaningful learning process. Teacher competence also includes adapting teaching methods to students' characteristics and addressing challenges during learning. Student readiness is equally important, where motivation to learn, adequate basic literacy skills, and willingness to actively participate in discussions and group activities enable students to follow each stage of the RADEC model more easily. With the synergy between supportive learning materials, teacher competence, and student readiness, implementing the RADEC model can effectively and positively impact students' conceptual understanding and critical thinking skills (Purwanto & Yanuarto, 2025).

Teaching materials are the most important component in the learning process that can increase students' understanding and motivation to learn (Ulia et al., 2019). Developing

good teaching materials requires careful planning and adapting them to students' needs. Using appropriate teaching materials can make the learning process more engaging and meaningful for students. Beyond teaching materials, a teacher must be able to teach effectively, master the class, master the material, and understand the students' backgrounds and circumstances. No matter how good the learning model chosen for the lesson, it will not work if the teacher cannot master it.

Implementing the RADEC learning model (Read, Answer, Discuss, Explain, Create) in mathematics subjects is influenced by various supporting and inhibiting factors determining its success level. On the supporting side, the RADEC model can enhance student engagement actively because each stage requires concrete participation, such as independent reading, answering questions, discussing, and explaining the concepts learned. This approach encourages active participation and stimulates students' critical and creative thinking skills. In this way, students can develop a deep and structured understanding of mathematical concepts, ultimately improving the quality of the learning process and learning outcomes (Fatimah et al., 2024).

Beyond student participation, the success of implementing the RADEC model heavily depends on the support from trained teachers and a conducive learning environment. Teachers who thoroughly understand the RADEC steps can effectively manage learning and adapt teaching methods to students' characteristics. A comfortable and supportive learning environment, both physically and psychologically, also plays a crucial role in facilitating active and collaborative learning processes. Conversely, limited time, insufficient resources, and students' unfamiliarity with this method may pose obstacles to effectively implementing the RADEC model.

Factors Inhibiting the Implementation of the RADEC Learning Model in Mathematics Subjects

In the implementation process of the Read, Answer, Discuss, Explain, and Create (RADEC) learning model in fourth-grade elementary school mathematics, the researcher found that this model provides significant benefits, such as enhancing active student engagement, promoting the development of critical thinking skills, and strengthening students' social and communication abilities. Through the application of each RADEC stage, students not only gradually master mathematical concepts but also experience more

enjoyable and meaningful learning. This approach helps students overcome the perception of mathematics as difficult, increasing motivation and overall learning outcomes (Gunawan et al., 2023).

However, several obstacles hinder the optimal implementation of the RADEC model. One of the main challenges identified is the limited instructional time available in the classroom. Each stage of the RADEC model—from reading, answering, discussing, explaining, to creating—requires sufficient time to be conducted effectively and thoroughly. In practice, however, the time allocated for mathematics lessons is often insufficient to complete all the stages fully. This situation forces some stages to be shortened or omitted, preventing the full potential of the RADEC method from being realized. Therefore, better time management and adjustment of teaching strategies are necessary to overcome these barriers and enhance the effectiveness of RADEC model implementation.

Some students expressed that mathematics learning became more interesting with implementing the RADEC model; however, the learning process often remained incomplete when the lesson ended. It indicates that the learning process frequently halts despite increased student enthusiasm before reaching the reflection or creation stages. Consequently, teachers need to adjust by dividing the material into several sessions, potentially reducing continuity and depth of student understanding. This situation highlights the necessity for better time management to ensure all RADEC stages are completed optimally, allowing for a comprehensive and meaningful learning experience (Novianti et al., 2025).

In addition to time constraints, the lack of teacher competence in managing the RADEC model poses a challenge. Not all teachers have a deep understanding and sufficient skills to implement the model effectively. Although the fourth-grade teachers studied demonstrated efforts to apply RADEC, challenges remain in time planning, classroom management, and adapting to students' varying readiness and abilities, including reading, critical thinking, and communication skills. During the initial implementation of RADEC, some students struggled to adjust to the active learning approach that demands high participation. For instance, in the "Answer" and "Explain" stages, some students felt afraid to respond due to uncertainty about their understanding or fear of giving incorrect answers.

Low learning readiness results in some students needing more time to understand the learning material, thus impacting delays in following the next stages in the RADEC model. In addition, students' unfamiliarity with group discussion activities and presentations in front of the class also hinders the effectiveness of the learning process designed by the model, so adaptation and habituation efforts are needed to increase student participation and involvement optimally.

CONCLUSION

Implementing the RADEC learning model in fourth-grade elementary school mathematics involves preliminary activities conducted by the teacher, including greetings, prayer, attendance check, motivation, and apperception that links previously learned material with new content. Subsequently, the teacher applies the five stages of the RADEC model—Read, Answer, Discuss, Explain, and Create—which foster an active and enjoyable learning experience for students. This model enhances students' critical thinking skills, confidence in expressing opinions, and social skills, particularly in understanding mathematical concepts that were previously perceived as difficult and monotonous. Supporting factors for successful implementation include relevant learning materials, teacher competence, and student readiness, especially in building self-confidence. However, inhibiting factors were identified, such as limited time to complete all RADEC stages, insufficient discussion and reading skills among teachers, and students' difficulties in reading and independent critical thinking. With appropriate understanding and management of these factors, the RADEC model implementation has significant potential to impact the mathematics learning process positively.

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