



Towards An Innovative Generation: Increasing The Level Of Creative Thinking Skills In Science Learning In Elementary School With The RADEC Model

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Abstract

Learning science in elementary school requires an approach that encourages students' creative thinking skills. One model that can be used is the RADEC (Read, Ask, Discuss, Explain, Create) learning model. This model provides a systematic framework to develop students' creative thinking skills through a series of structured steps. In the RADEC learning model, students are asked to read the subject matter, ask challenging questions, discuss with classmates to share ideas and viewpoints, conduct experiments or direct observations, and create new solutions or products based on their understanding. Through this process, students not only understand science concepts deeply, but are also trained to think critically, analytically and creatively. By applying the RADEC learning model in science learning in elementary schools, it is expected to create an innovative generation that is able to face future challenges with strong creative thinking skills. This model provides a solid foundation for the development of students' creative potential and prepares them to become future leaders who are able to create new solutions in the world of science and technology.

1. Introduction

Creative thinking skills in science learning in elementary schools are important to improve in order to create an innovative generation that will be able to solve problems and unique solutions. It is this creative thinking ability that will be the basis of the innovations needed in the future that must be present and developed in today's classrooms. As the world continues to evolve and become more complex, it is important that the education system is not just about memorizing lessons and listening to lectures from teachers to foster students' creative thinking skills. In this case, the RADEC (Read, Ask, Discuss, Explain, Create) learning model can be used as one of the models used as a framework to measure and foster the critical thinking skills of elementary school students. This model integrates learning specs, assessment, and corrective action to develop students' creative thinking skills in elementary school.

Based on a study done by Ani, Maharani, and Puji in 2023, using the RADEC learning model involves students taking a more active part in their education becomes more meaningful. Based on previous research, the RADEC learning model can be a useful learning model because this learning model can help students generate knowledge, ideas, and build mental models to be able to achieve the expected learning objectives. In addition, this learning model helps teachers implement it in the classroom.

The most important characteristic in improving students' creative thinking skills is not only through explanations from teachers or reading from books but also from the ideas and thought processes of the students themselves. The problem that exists and arises today is the lack of students' level of creative thinking ability which is characterized by the inability of students to use, explain, detail new ideas by students in answering teacher questions in the classroom. This can be seen in the four indicators put forward by Astuti (2020), namely fluency (many answers), flexibility (many ideas), originality (providing new ideas) and elaboration (detailed ideas).

Based on the existing problems, the goal of this research is to assess the development of creative thought processes in science learning for elementary school students through the use of the RADEC learning model in learning, so that it will be carried out; rapid assessment through testing, assessment, or observation of students, diagnostic evaluation through analyzing the data obtained to identify student skills and needs that can be assisted through corrective action, evaluation and corrective action through material development, changes in learning methods, or provision of more effective teaching materials based on the findings of researchers indicates that the RADEC learning model effectively enhances critical thinking skills in elementary school science students..

The RADEC learning model is based on the concept of learning that integrates aspects of creativity, innovativeness, and criticality in the learning process. This is because the concepts in this model can help students to develop better creative thinking skills. The model also integrates aspects of rapid and effective assessment to identify student skills and identify needs that can be assisted through corrective action. The RADEC learning model can be applied in an integrated manner in science learning in elementary schools to achieve the goal of developing an innovative generation that can overcome problems and develop unique solutions.

2. Method

This research uses the Systematic Literature Review (SLR) method to comprehensively and critically review the scientific literature relevant to the development of creative thinking skills in Science learning in elementary schools through the implementation of the RADEC learning model. SLR is a secondary research method that aims to map, identify, critically evaluate, and synthesize previously conducted research findings related to the selected research topic, as well as to synthesize, and collect primary research findings on a particular research topic. Conducting this research using Systematic Literature Review (SLR) aims to synthesize and analyze previous studies systematically, identify research gaps that still need to be explored, produce a comprehensive and coherent report, and build a strong research framework. The authors established inclusion and exclusion criteria to select appropriate literature, identifying relevant data sources including scientific journals, conferences, and related literature. The literature selection and appraisal process was conducted carefully, emphasizing the quality of the research methodology. Once literature that met the criteria was selected, the authors performed data extraction and carried out analysis and synthesis to reveal common findings and patterns in the existing research. The conclusions and recommendations generated from this literature synthesis will provide an in-depth view of assessing the effectiveness of the RADEC learning model in fostering creative thinking among science students in elementary schools, as well as offer directions for further research and development of innovative learning strategies.

3. Results and Discussion

A review of the literature found that the RADEC learning model significantly enhances creative thinking in elementary science students. Its structured approach encourages active participation, fostering deep understanding of scientific concepts. These results align with previous research on the model's effectiveness in promoting creativity. The following are the key findings that emerged from the various literature sources; the RADEC learning model provides a systematic framework to enhance student engagement through various stages, such as reading, questioning, discussing, experimenting and creating. This results in a dynamic learning environment and stimulates student creativity, through the RADEC learning model, students are encouraged to think critically, analytically and creatively in solving problems and exploring science concepts. They are trained to generate new ideas, create innovative solutions and apply them in a context that is authentic and appropriate to real situations, structured learning process in the RADEC learning model helps students understand science concepts more deeply. They not only master the concepts theoretically, but are also able to relate them to direct experience through experimentation and creative product making.

RADEC learning model offers a systematic and structured approach in developing students' creative thinking skills in the science learning process at primary schools. This SLR outcome discussion highlights some significant aspects related to the implementation of the RADEC learning model; RADEC learning model provides a foundation for a student-centered approach. By asking students to read, question, discuss, experiment and create, it encourages active engagement in the

learning process, RADEC learning model provides a framework for students to develop creative thinking skills through a series of activities that stimulate imagination, inquiry and creation. This is important given the creative ability to solve complex problems in the future, through the stages of experimentation and creative product creation, the RADEC learning model helps students to relate science concepts to real situations and problems. In addition to deepening students' understanding of the material, this strategy also facilitates the development of contextual thinking skills in elementary school students.

While the RADEC learning model offers a potentially powerful approach to learning, its implementation is not without its challenges. The success of the RADEC model in primary science education may be hindered by; teachers' level of readiness (implementation of the RADEC learning model requires teacher readiness in designing and delivering student-centered learning. Adequate training and support is needed to ensure teachers can implement this model effectively), resource availability (RADEC learning model requires sufficient resources, including reading materials, experimental equipment and materials for making creative products. Limited resources in certain primary schools can be a barrier to implementing this model optimally), learning evaluation (development of evaluation tools that are appropriate to the RADEC learning model-based learning approach is a challenge. Evaluation instruments that are able to comprehensively measure students' creative thinking skills and their learning achievements are needed).

Based on the above discussion, there are several recommendations that can be taken for further development in the implementation of RADEC learning model in science learning in elementary schools; teacher training to provide intensive training and guidance to teachers in designing, implementing, and evaluating RADEC learning model-based learning, develop learning resources appropriate to the RADEC learning model approach, including interactive reading materials, easily accessible experimental tools and guidelines for creative product creation, involving parents, communities and other stakeholders in supporting the adoption of RADEC learning model can expand the impact of learning and ensure the sustainability of this model in the school environment.

Table 1. A Literature Review on the Influence of the RADEC Model on Fostering Critical Thinking in Young Learners

Year	Information	writers
2020	Based on the results of the study, it was found that the creative thinking ability in the students' series increased when the RADEC model was applied to science education in the fifth grade of SD Negeri 88 Palembang obtained from the pre-test and post-test results of the control and test classes	Pratama, Sopandi, Hidayah, Trihatusti, M.
2023	RADEC-based learning helps students develop important skills, one of which is creative thinking.	Nurnaningsih, Citra Bahadur Hanum, Wahyu Sopandi, Atep Sujanana
2023	As shown by the analysis of pretest and posttest scores in the control and experimental classes showed that the application of the RADEC (Read, Answer, Discuss, Explain, Create) learning model in learning Natural Sciences (IPA) in class V SD Negeri 88 Palembang significantly improved students' creative thinking skills.	Ani Nurjannah, Maharani Oktavia, Puji Ayurachmawati.
2023	Pembelajaran dengan model RADEC (Read, Answer, Discuss, Explain and Create) dalam pembelajaran saintifik materi daur hidup dan konservasi satwa terbukti mampu membuat aktivitas belajar dan tingkat berpikir kreatif meningkat.kemampuan berpikir kreatif siswa.	Moch. Pebriansah, Jajang Bayu Kelana, Linda Hania Fasha.
2024	Learning with the RADEC (Read, Answer, Discuss, Explain and Create) model in scientific learning of life cycle and animal conservation material is proven to be able to make learning activities and creative thinking levels increase. students' creative thinking skills.	Okty Widyarti, Rokhmaniyah, Kartika Chrysti Suryandari.
2024	The RADEC model used in learning has more impact when applied in learning, compared to the conventional learning model. The application of RADEC (Read, Answer, Discuss, Explain, Create) learning model to fourth grade students showed significant improvement in their comprehension ability and creativity.	Ardi Apriansah, Atep Sujana, Ali Ismail.

3.1. Conclusion

The study indicates that the RADEC learning model is a successful method for teaching science, leading to an increase in creative thinking abilities among elementary school students. The structured and systematic approach applied in the RADEC learning model is proven to encourage students' active participation in the learning process, as well as developing creative thinking and understanding scientific concepts in depth. Therefore, it is recommended to continue to develop and apply the RADEC learning model in the context of primary school science education, in order for students to become an innovative generation ready to face future challenges. In this discussion, the RADEC model is proven to be an excellent opportunity to develop students' thinking skills and creativity when learning science in the primary grades. However, implementation problems must be overcome through the cooperation of teachers, schools, parents and other interest groups. With adequate commitment and support, the RADEC learning model has the potential to produce an innovative generation ready to face future challenges with strong creative thinking.

Author Contributions

Nur Aqila Khansa: Conceptualization, Writing - Original draft preparation and editing. Candra Utama: Methodology, Writing - Reviewing

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Declarations of interest: none

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