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Enhancing Elementary Students' Learning Interest in Science with the 'Make-a-Match' Cooperative Learning Model

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ABSTRACT

The objective of this study is to enhance students' engagement in learning natural sciences through the implementation of the 'Make-a-Match' cooperative learning model. The research was conducted with fifth-grade students at a public primary school in Purworejo, Indonesia comprising 19 students, with 14 males and 5 females. Employing a class action research design, the independent variable was the 'Make-a-Match' cooperative learning model, while the dependent variable was students' learning activity in natural sciences. Data were gathered through observation, documentation, and field notes, with analysis focused on observations of the learning process conducted by both teachers and students. Findings revealed an initial average of 48.75% in the first cycle, increasing to 75.83% in the second cycle. These results demonstrate that the application of the 'Make-a-Match' cooperative learning model effectively enhances students' learning activity in the science subject among fifth-grade elementary school students.

Keywords
Cooperative Learning
Elementary Students
Learning Interest
Make-a-Match
Science

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Introduction

Active student participation is fundamental in primary student learning, as it lays the groundwork for their educational journey [1]. At this formative stage, students not only acquire fundamental academic skills but also develop essential cognitive, social, and emotional capacities that will shape their future academic and personal endeavors [2]. Actively engaging primary students in the learning process serves several critical purposes. Firstly, it enhances understanding by promoting deeper comprehension of concepts through hands-on activities, interactive discussions, and collaborative projects [3]. When students are actively involved in their learning, they are more likely to grasp abstract concepts and make meaningful connections between theoretical knowledge and real-life applications. Secondly, active participation fosters the retention and application of knowledge in various contexts [4]. By participating in interactive learning experiences, primary students not only retain information more effectively but also develop the skills to apply their knowledge in practical situations, fostering critical thinking and problem-solving abilities. Thirdly, active engagement cultivates motivation and interest in learning [5]. When students are actively involved in their educational journey, they develop a sense of ownership and responsibility for their learning outcomes, leading to increased enthusiasm, curiosity, and a genuine desire to explore and learn more.

Additionally, active participation facilitates social and emotional development. Through group activities and cooperative learning experiences, students learn essential skills such as communication, teamwork, empathy, and conflict resolution, which are vital for their personal and academic success [6]. Finally, active engagement prepares students for lifelong learning by instilling a proactive approach to education [7]. By encouraging students to take an active role in their learning early on, primary education sets the stage for continuous self-improvement and lifelong learning habits, equipping students with the skills and attitudes necessary to navigate future challenges and pursue their academic and personal goals. Overall, active student participation is essential in primary education as it not only enhances academic achievement but also shapes students into well-rounded individuals prepared to thrive in an ever-changing world.

The level of student engagement greatly influences the learning process. In reality, many students are often inactive participants during lessons. This lack of engagement can stem from various internal and external factors. Based on observations conducted with 5th-grade students at a public primary school in Purworejo, Indonesia, it was evident that the teaching process lacked diversity. Instruction predominantly revolved around the teacher, with students primarily engaged in writing and listening, resulting in a text-centric approach.

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Additionally, some students were observed chatting and playing with classmates, hindering the learning process and limiting their understanding of the material.

After lessons, many students struggled with assigned exercises, with 14 out of 19 students experiencing difficulties and misunderstandings. To address this issue and foster active engagement and comprehensive understanding, the researcher proposes the implementation of a more captivating learning model that prioritizes student involvement and stimulates critical thinking.

Cooperative learning models can effectively encourage active participation and critical thinking among students during the learning process [6],[8]. The researcher suggests using the Make-a-Match cooperative learning model, where students pair up to find matching pairs of cards, each containing either a question or an answer. This model fosters a lively and enjoyable learning environment characterized by interactive engagement. According to Ref. [9], the Make-a-Match cooperative learning model involves pairing up students through cards, where each card contains either a question or an answer, fostering interactive learning experiences. Rusman adds that the Make-a-Match model is a type of cooperative learning method where students search for partners while learning about a concept or topic in an enjoyable atmosphere.

The theoretical significance of this research lies in guiding teachers on utilizing cooperative learning models to enhance student engagement and minimize difficulties during the learning process. The insights gained from this research can provide a robust framework for educators, helping them understand the underlying principles of cooperative learning and how these can be effectively applied in classroom settings. This theoretical foundation is crucial for developing strategies that can foster a more interactive and collaborative learning environment, thereby addressing various challenges students face in traditional educational setups. Practically, the findings can serve as a reference for schools to introduce a variety of learning models to boost student engagement [10]. By implementing these diverse learning strategies, schools can create a more dynamic and inclusive educational experience that caters to the varied needs and learning styles of students. This practical application not only enhances the overall educational experience but also promotes a more engaged and motivated student body. For teachers, this research is expected to enhance their role as facilitators and educators, equipping them with knowledge, insights, and teaching skills to improve student engagement using the Make-a-Match cooperative learning model. This model encourages active participation and collaboration among students, which can lead to a deeper understanding of the subject matter and improved academic performance. By integrating these techniques into their teaching practices, teachers can create a more supportive and engaging learning environment that stimulates student interest and participation.

For students, it is anticipated that this research will increase their engagement in enjoyable and meaningful learning experiences. The cooperative learning model fosters a sense of community and collaboration, which can make learning more enjoyable and relevant to students' lives. This approach not only enhances academic achievement but also supports the development of important social and interpersonal skills, such as communication, teamwork, and problem-solving.

The objective of this research is to enhance students' learning engagement in science subjects by implementing the Make-a-Match cooperative learning model. The research problem addressed in this study is how to enhance students' learning engagement in science subjects using the Make-a-Match cooperative learning model. This study aims to explore efforts to enhance students' learning engagement in science subjects through this model.

Literature Review

A. Learning Activeness

Ref. [11] asserts that students' activeness in the learning process can stimulate and develop their talents, critical thinking skills, and problem-solving abilities in daily life. Active learning involves students engaging directly in the learning process, participating in discussions, asking questions, and applying what they learn in practical situations [12]. This engagement not only fosters a deeper understanding of the material but also enhances the development of essential skills such as critical thinking and problem-solving [13]. Active learning environments encourage students to take responsibility for their learning, thereby increasing their motivation and commitment to the subject matter [14]. Furthermore, active learning supports the development of independent learning skills, which are crucial for lifelong learning and adaptability in various contexts [15].

B. Cooperative Learning

Cooperative learning is an instructional strategy where students work together in small groups to achieve shared learning goals. According to Ref. [16], cooperative learning encompasses various teaching models in which students assist each other in learning the subject matter. This approach is designed to enhance student engagement, understanding, and retention of material by leveraging the diverse abilities and perspectives within the group. Ref. [17] defines cooperative learning as a learning atmosphere where students interact in small groups to complete academic tasks, striving to achieve common goals. This interaction fosters a sense of community and collaboration, essential for developing social and academic skills. Ref. [18] describes cooperative learning as a form of teaching that emphasizes cooperation among groups to achieve learning objectives. This cooperative effort helps students develop teamwork skills, learn to value different perspectives and build a supportive learning

environment. Ref. [19] further explains that cooperative learning involves students working together in small groups, and helping each other learn. Typically, these groups consist of four students with varying abilities, allowing for a rich exchange of ideas and peer teaching. One specific technique within cooperative learning is the Make-a-Match model [20]. Make-a-Match involves students finding pairs while learning about a specific concept or topic in an enjoyable atmosphere. This technique can be applied to all subjects and grade levels, making it a versatile and engaging method for enhancing student learning [21].

Material And Methods

A. Research Design

This study is a Classroom Action Research (CAR) conducted to improve or enhance the quality of teaching and learning practices within the classroom. The design of this classroom action research follows the spiral model proposed by Kemmis & McTaggart involving cycles progressing from one to the next. Each cycle consists of planning, action, observation, and reflection. The subjects of this research are fifth-grade students during the academic year 2021/2022, totaling 19 students. Data collection techniques included observation, documentation, and field notes. Table 1 shows the indicator used during observation.

Table 1. Indicators of Learning Activeness

No	Research Indicator
1.	Paying attention to the teacher's explanations
2.	Asking questions
3.	Answering questions
4.	Interacting with peers while searching for card pairs
5.	Explaining the material during presentations
6.	Observing other students during presentations

B. Data Analysis Technique

Data analysis is conducted for each aspect of the activities. In this research, data analysis involves reflecting on the observation results of the teaching and learning process conducted by both teachers and students in the classroom. The analysis of student learning activeness utilizes descriptive quantitative analysis with percentages. Observation data on student activeness is analyzed and presented in percentage form, which is then interpreted in words. The category used to measure student activeness is determined by adding up the scores for each indicator, resulting in the average percentage of student activeness. Student activeness is considered improved if the average percentage of student activeness is at least 75% of the total number of students in the class. See Table 2.

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Table 2. Indicator achievement target

Baseline Indicator	Achievement Cycle I	Achievement Cycle II
Paying attention to teacher explanations	Based on interviews with the teacher, at least 65% of students pay attention to the teacher when delivering the material.	Reached 75% of students who pay attention to the teacher when delivering the material.
Asking questions	Based on interviews with the teacher, at least 22% of students ask questions during the learning process.	Reached 30% of students who ask questions during the learning process.
Answering questions	Based on interviews with the teacher, at least 22% of students answer questions or respond.	Reached 30% of students who answered questions or responded.
Interacting with peers while searching for card pairs	The teacher has not yet used cooperative learning of the Make-a-Match type, but at least 65% of students interact with other students when searching for card pairs.	Reached 75% of students who interact with other students when searching for card pairs.
Explaining the material during presentations	The teacher has not yet used cooperative learning of the Make-a-Match type, but at least 65% of students explain the material during presentations with a partner.	Reached 75% of students who explain the material during presentations with a partner.
Observing other students during presentations	The teacher has not yet used cooperative learning of the Make-a-Match type, but at least 65% of students observe other students' explanations during presentations.	Reached 75% of students who observe other students' explanations during presentations.

Results and Discussion

The Classroom Action Research conducted on fifth-grade students, regarding students' activeness in the subject of Science using the cooperative learning model of Make-a-Match in Cycle 1 and Cycle 2 showed an increase in average values as follows:

Table 3. The result of Cycle I

Observation Aspect	Cycle I		Average	Target
	Session 1	Session 2		
1. Paying attention to teacher explanations	58.0%	63.0%	60.5%	65.0%
2. Asking questions	42.0%	53.0%	47.5%	22.0%
3. Answering questions	21.0%	32.0%	26.5%	22.0%
4. Interacting with peers while searching for card pairs	53.0%	68.0%	60.5%	65.0%
5. Explaining the material during presentations	26.0%	58.0%	42.0%	65.0%
6. Observing other students during presentations	53.0%	58.0%	55.5%	65.0%
Average	52.2%	55.3%	48.8%	51.0%

Based on observations of student activeness using the cooperative learning model of Make-a-Match in Cycle I, not all students exhibited activeness as observed in the measured aspects and achieved success indicators. From the observation results, the average student activeness in Cycle I was 42.16% for the first session and 55.33% for the second session. The increase in student activeness from the first to the second session of Cycle I was 13.17%.

Table 4. The result of Cycle II

Observation Aspect	Cycle II		Average	Target
	Session 1	Session 2		
1. Paying attention to teacher explanations	84.0%	95.0%	89.5%	75.0%
2. Asking questions	58.0%	63.0%	60.5%	30.0%
3. Answering questions	58.0%	68.0%	63.0%	30.0%
4. Interacting with peers while searching for card pairs	79.0%	89.0%	84.0%	75.0%
5. Explaining the material during presentations	74.0%	84.0%	79.0%	75.0%
6. Observing other students during presentations	74.0%	84.0%	79.0%	75.0%
Average	71.2%	80.5%	75.8%	60.0%

From the implementation of cooperative learning using the Make-a-Match model, it can be shown that there is an increase in student activeness and learning outcomes. The average student activeness is 75.83%, exceeding the research success criterion of 60%.

Table 5. Example table Table 5. Summary of Cycle I and Cycle II

Observation Aspect	Cycle II	Cycle II	Gain
1. Paying attention to teacher explanations	60.5%	89.5%	29.0%
2. Asking questions	47.5%	60.5%	13.0%
3. Answering questions	26.5%	63.0%	36.5%
4. Interacting with peers while searching for card pairs	60.5%	84.0%	23.5%
5. Explaining the material during presentations	42.0%	79.0%	35.0%
6. Observing other students during presentations	55.5%	79.0%	23.5%
Average	48.8%	75.8%	27.0%

The data above indicates that in Cycle I, the average percentage of student activeness was 48.75%. In Cycle II, with the improvement of teaching, learning can proceed more optimally. The average percentage of student activeness in Cycle II is 75.83%, with all indicators meeting the success criteria. The increase in the average percentage of student activeness from Cycle I to Cycle II is 27%.

Based on the research findings and drawing from Ref. [22]-[25], which delineates aspects of student learning activeness and its correlation with various activities employed in cooperative learning of the Make-a-Match type, it becomes evident that this instructional approach significantly augments student engagement during the learning process. Ref. [23]

likely emphasizes the importance of interactive and participatory learning experiences, which are fundamental aspects of cooperative learning methodologies like Make-a-Match.

The conclusion drawn from this synthesis aligns well with Ref. [26] regarding the efficacy of Make-a-Match cooperative learning in enhancing students' cognitive and psychomotor learning activities. This suggests that Make-a-Match cooperative learning not only promotes cognitive engagement, such as critical thinking and problem-solving, but also enhances psychomotor skills, which involve physical activity and coordination. Consequently, Make-a-Match cooperative learning emerges as a viable alternative method to cultivate heightened levels of student activeness within the learning environment.

In essence, these theoretical underpinnings and empirical evidence underscore the value of implementing cooperative learning models like Make-a-Match to foster an active and dynamic learning atmosphere. By integrating such methodologies into classroom practices, educators can effectively nurture students' active participation, thereby facilitating deeper understanding, skill development, and overall academic success.

Conclusion

The Classroom Action Research aimed to boost student activeness in Science through the Make-a-Match cooperative learning model. Results show notable enhancements in student engagement and learning outcomes. Cycle I saw an average activeness of 48.75%, indicating initial success but also areas for improvement. In Cycle II, activeness surged to 75.83%, surpassing the 60% success benchmark. The 27% increase underscores the model's effectiveness, with students demonstrating heightened engagement in various activities. This research underscores the Make-a-Match model's efficacy in fostering student activeness and enhancing Science learning outcomes, offering valuable insights for educators seeking innovative teaching approaches.

Conflict of Interest

We declare that there is no conflict of interest.

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