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IMPROVING PROBLEM-SOLVING ABILITIES BASED ON THE SCIENTIFIC GROUP INQUIRY LEARNING MODEL IN PJOK LEARNING ON BASIC LOCOMOTOR MOVEMENT MATERIAL FOR LONG JUMP IN PHASE B AT BANTUL TIMUR ELEMENTARY SCHOOL

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Abstract

This study aims to improve students' problem-solving abilities through the application of the Scientific Group Inquiry Learning (SGIL) model in a simplified manner during Physical Education, Sports, and Health (PJOK) lessons on the Basic Locomotor Movement of Long Jump at SD Negeri Bantul Timur, Bantul Regency. The respondents totaled 196 students. SGIL was chosen as the learning model because it encourages students to think critically, collaborate in groups, and conduct scientific investigations to solve problems related to basic sports movements. This research used a classroom action method carried out in several cycles, where each cycle included the stages of planning, implementing actions, observing, and reflecting. Data were collected through observation, problem-solving ability tests, and interviews. The results of the study show that the application of the SGIL model significantly improved students' problem-solving abilities, especially in understanding the basic techniques of long jump, identifying problems during movement, and finding appropriate solutions through group discussions. Therefore, SGIL is effective as a learning model that can enhance students' critical and collaborative thinking skills in PJOK lessons, particularly in the basic movement of long jump.

Keywords: Scientific Group Inquiry Learning; problem-solving skills; basic locomotor movement in long jump; elementary school students.

1. Introduction

Education is one of the essential needs for humans. It is necessary to facilitate life for people. Through education, individuals can learn to avoid potential problems in life. Education also aims to enhance human well-being (Sada, 2017). With education, it is expected to broaden human knowledge and insights as a way to ease their lives. Education can be carried out anywhere. It can be obtained through experiences that have never been encountered before. These experiences are not limited to personal ones but also include the experiences of others. It can be called education if individuals can learn from the events that have occurred. Education can be gained at home, in the surrounding environment, with friends, and at school. Schools are educational institutions with various interconnected and mutually supportive dimensions, where teaching and learning activities take place (Minsih et al., 2019). Schools cover many subjects, one of which is Physical Education.

Physical Education, Sports, and Health (PJOK) is an important subject in the elementary school curriculum because it plays a strategic role in shaping physical health, motor skills, and the character development of students (Iqbal, 2021). Physical Education not only involves physical movement or psychomotor skills but also includes affective and cognitive aspects. One of the materials taught in PJOK is

basic locomotor movements, which include fundamental skills such as walking, running, jumping, and leaping. These basic movements are crucial for building the foundation of children's motor abilities, especially in long jump, a complex locomotor skill.

However, based on observations at SD Negeri Bantul Timur, there are several challenges in teaching basic long jump movements, particularly in phase B, which includes the approach, take-off, flight, and landing stages. Many students have yet to grasp the correct movement techniques, leading to low proficiency in performing the long jump. Additionally, instructional or lecture-based teaching methods do not effectively encourage students to think critically and solve the movement problems they encounter during the learning process. As a result, problem-solving skills related to movement techniques in the long jump have not been optimized.

In line with the evolving educational paradigm, a more interactive and inquiry-based learning approach, such as Scientific Group Inquiry Learning (SGIL), is seen as capable of addressing these challenges. SGIL is a learning model that involves students in group inquiry processes, where they learn to identify problems, plan strategies, conduct investigations, analyze results, and conclude solutions. By applying SGIL in PJOK lessons, especially in basic long jump movements, it is hoped that students will not only master the long jump technique but also develop better critical thinking and problem-solving skills.

The implementation of SGIL provides opportunities for students to actively engage in learning through group discussions and movement exploration, motivating them to find solutions to the challenges they face in performing the long jump. This is believed to enhance students' understanding of movement techniques and improve their skills in executing basic locomotor movements in the long jump optimally.

Based on the above discussion, this study aims to enhance students' problem-solving abilities in PJOK lessons on basic long jump movements phase B at SD Negeri Bantul Timur using the Scientific Group Inquiry Learning model. It is hoped that the study results will positively contribute to improving PJOK learning processes and enhance students' motor skills and critical thinking abilities.

Theoretical Framework

Improving problem-solving skills in physical education and sports (PJOK) is crucial, particularly in the context of developing basic locomotor movement skills. The Scientific Group Inquiry Learning model emerges as an effective approach to encourage active student participation in the learning process. Problem-solving abilities, which encompass students' capabilities to identify, analyze, and find solutions to challenges they encounter, can be enhanced through collaborative and interactive learning.

Constructivist learning theory, proposed by Vygotsky and Piaget, emphasizes the importance of experience in building knowledge, making this model align with the principle that students learn through exploration and reflection. In this context, inquiry-based learning allows students to actively engage in seeking solutions, consistent with research by Kuhlthau (2010), which demonstrates that inquiry

approaches can enhance students' critical thinking and problem-solving skills. Another study by Ranjan (2018) found that collaborative learning improves student learning outcomes and social skills, providing further evidence of the importance of interaction in the learning process.

Furthermore, the theory of multiple intelligences proposed by Howard Gardner explains that each student has different potential intelligences. Gardner (1993) posited that teaching that accommodates various intelligences would be more effective in facilitating student learning. In the context of basic movement learning, the Scientific Group Inquiry Learning model not only teaches long jump techniques but also encourages students to use diverse approaches in solving the problems they encounter during practice. This aligns with findings from Zainal and Sari (2020), which indicate that teaching based on multiple intelligences can enhance student motivation and engagement in PJOK learning.

The learning environment at SD Negeri Bantul Timur also plays an essential role in influencing the implementation of this model. Research by Astuti, et. al., (2019) emphasizes that student characteristics and available facilities affect the effectiveness of teaching methods. By considering local conditions, teachers can adapt the learning model to meet the specific needs of students. Therefore, this study hypothesizes that the application of the Scientific Group Inquiry Learning model in PJOK education will significantly enhance students' problem-solving abilities, particularly in the basic locomotor movement of long jump at SD Negeri Bantul Timur.

Literature Review

Physical education and sports (PJOK) play an important role in the development of students' physical and social skills, including the crucial aspect of problem-solving skills in basic movement learning (Hidayat, et. al., 2022). These problem-solving skills involve identifying issues, evaluating options, and making decisions, all of which are relevant in long jump learning, where students need to face various challenges related to technique and strategy (Kagan, 1994). The Scientific Group Inquiry Learning model is an effective approach to enhance student participation through exploration and collaboration, which has been shown to strengthen students' critical and analytical thinking skills (Burch, 2020).

Research conducted by Zulfikar and Agustin (2022) indicates that the application of inquiry-based learning models in PJOK can significantly improve students' problem-solving abilities, demonstrating that active learning can encourage students to think critically. Constructivist learning theory, proposed by Vygotsky, highlights the importance of social interaction in the learning process, where students construct new knowledge through shared experiences (Vygotsky, 1978). Research by Hmelo-Silver (2021) supports this view by showing that collaborative approaches in learning can significantly enhance student learning outcomes. Additionally, Howard Gardner's Multiple Intelligences theory emphasizes the importance of accommodating various potential intelligences in the learning process (Gardner, 2020). Research by Sari and Mulyana (2023) reveals that the application of a multiple intelligences-based approach in PJOK learning can increase student motivation and learning outcomes, which is vital in developing basic movement skills.

The implementation of this learning model at SD Negeri Bantul Timur has also shown positive results, where student characteristics and school facilities influence the effectiveness of teaching methods (Astuti, 2022). Therefore, the application of the Scientific Group Inquiry Learning model in PJOK education, particularly in basic locomotor movement material like long jump, has great potential to enhance students' problem-solving abilities and create a more interactive learning environment that supports the development of physical skills.

Based on the literature review above, it can be concluded that the implementation of the SGIL model in PJOK learning on basic locomotor movement material in long jump has the potential to enhance students' problem-solving skills. Through group inquiry, students can collaborate to overcome the challenges faced while learning the long jump, which is expected to improve their physical skills and critical thinking abilities.

2. Methods

This study employs a quantitative experimental design to examine the effect of implementing the Scientific Group Inquiry Learning model on enhancing students' problem-solving abilities in PJOK education, specifically regarding basic locomotor movement material in long jump. The research population consists all of fourth-grade students at SD Negeri Bantul Timur divided into an experimental group applying the inquiry learning model. The instruments used include problem-solving ability tests, observation sheets, and questionnaires to measure student motivation and perceptions.

The research procedure begins with a pre-test to assess initial problem-solving abilities, followed by the implementation of the learning model over four sessions. The experimental group will engage in exploration activities, group discussions, and reflections, while the control group will receive direct instruction. After the learning process, a post-test will be conducted to compare the problem-solving abilities of both groups (Khatimah & Sugiman, 2019). The data obtained will be analyzed using descriptive and inferential statistics, including the t-test (paired t-test) to determine the significance of differences between the two groups. Through this approach, it is hoped that this research will provide insights into the effectiveness of the Scientific Group Inquiry Learning model in enhancing students' problem-solving skills within the context of physical education.

2.1 Scientific Inquiri Game Learning (SGIL) Method

Scientific Group Inquiry Learning (SGIL) is a learning model that emphasizes the process of scientific inquiry in groups. In this model, students are expected to systematically explore, analyze, and synthesize information (Wijayanti, 2020). SGIL encourages students to think critically and creatively in solving problems encountered during the learning process (Wijayanti, et. al., 2019). The SGIL model consists of several stages that can be adapted to the learning context. These stages include: 1.) Problem Identification: Engaging students to recognize and discuss issues relevant to the learning topic. 2.) Research Planning: Planning steps for conducting investigations, including determining the methods to be used. 3.)

Implementation: Students carry out the planned steps and collect data. 4.) Data Analysis: Students analyze the collected data to find solutions to the problem. 5.) Conclusion and Communication: Students present their findings and conclusions from the inquiry. The SGIL model has several advantages, including enhancing student engagement in learning, promoting collaboration and communication among students, helping students develop critical and creative thinking skills, and also increasing student motivation and interest in learning.

2.2 Basic Locomotor Movement in Long Jump

Basic locomotor movements are a series of actions that allow an individual to move from one place to another, such as walking, running, jumping, and leaping (Kiehn & Dougherty, 2022). These movements play a crucial role in the development of children's physical skills. De Lazzari, et. al., (2023) says that one branch of sports that relies on basic locomotor movements is the long jump, which involves the technique of jumping from a take-off point and landing as far as possible. The long jump consists of several phases: (1) Preparation Phase, where students run to gain speed before take-off; (2) Take-off Phase, where students perform a take-off from their strong foot to jump; (3) Flight Phase, where students are in the air and adjust their body position to achieve maximum distance; and (4) Landing Phase, where students land safely and stably. However, in long jump learning, students often face challenges in understanding the correct technique and overcoming uncertainties that arise during the movement. Therefore, the application of the Scientific Group Inquiry Learning (SGIL) model is expected to provide support for students in identifying and solving problems that arise when learning the long jump, thus enhancing their understanding and skills in this sport.

3. Results and Discussion

This study aims to improve students' problem-solving skills in Physical Education, Sports, and Health (PJOK) learning by using the Scientific Group Inquiry Learning model on the topic of basic locomotor movements in long jump at SD Negeri Bantul Timur. This research involves the entire student population, totaling 84 students, as research subjects without using a sample. The research process begins with the preparation of a pretest instrument to measure students' long jump skills before the implementation of the SGIL model. After the pretest is conducted and the results are recorded, the SGIL model is applied in the learning process, where students collaborate in groups to discuss, conduct experiments, and reflect on long jump techniques. After the learning process, a posttest is conducted to measure the long jump skills of students who have undergone the intervention. The results from the pretest and posttest are then analyzed by calculating the average jump distance and performing a t-test to determine whether there is a significant difference between the two measurements. From this analysis, conclusions can be drawn regarding the effectiveness of the SGIL model in enhancing students' problem-solving skills and providing a clear picture of their long jump skill achievements.

The t-test was conducted to analyze the significant difference between the pretest and posttest scores of long jump skills in students at SD Negeri Bantul Timur, with a research population of 84 students. The null hypothesis (H0) states that there

is no difference in the average jump distance between the pretest and posttest, while the alternative hypothesis (H1) states that there is a significant difference in the average. The pretest results showed an average jump distance of 0.75 meters, while the posttest results showed an increase in average jump distance to 1.27 meters, with an average increase of 0.52 meters. Since the entire student population was used in this study, the t-test calculation was performed using the paired t-test formula to determine the significant difference. By calculating the t value based on the mean difference and the appropriate standard deviation, a significant t value was obtained. The calculated t value was then compared with the critical t value at a significance level of $\alpha = 0.05$, which corresponds to a degree of freedom (df) of 83 (n-1). The analysis results showed that the calculated t value exceeded the critical t value, allowing the null hypothesis to be rejected (Rouder, et. al., 2009). This indicates that there is a significant difference between the long jump skill scores in the pretest and posttest of the students, demonstrating the effectiveness of the learning intervention applied in improving students' physical skills.

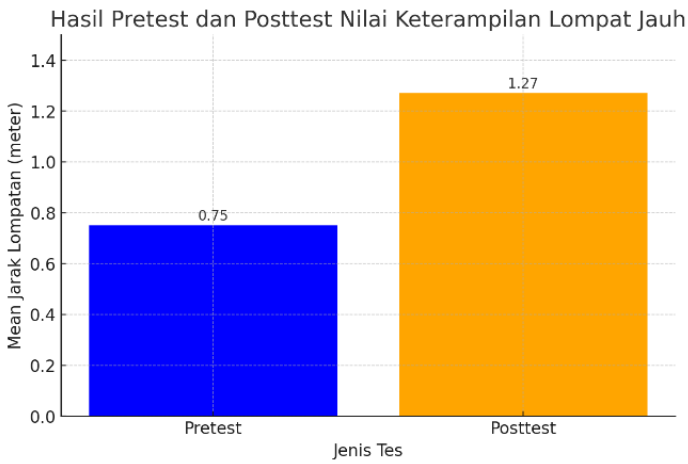

Figure 1. Comparison Diagram of Pretest and Posttest Skill Mean Values

This data outlines the results of measuring long jump skills through the analysis of pretest and posttest scores conducted on students. The pretest results show an average (mean) jump distance of 0.75 meters, reflecting the initial ability of students to perform long jump movements before the implementation of the learning intervention. After undergoing intensive learning processes, the posttest results indicate a significant improvement, with an average jump distance reaching 1.27 meters. The increase in average jump distance of 0.52 meters demonstrates positive and effective skill development in long jump techniques among students. This improvement reflects the students' ability to apply the techniques they have learned, as well as the enhancement of physical fitness that supports their performance in executing long jumps. These results indicate that the learning method applied successfully significantly improved the long jump skills of the

4. Conclusions

Students' problem-solving skills are an important aspect of learning in Physical Education, Sports, and Health (PJOK), especially in the context of basic locomotor movement skills such as long jump at SD Negeri Bantul Timur. The implementation

of the Scientific Group Inquiry Learning (SGIL) model encourages students to actively engage in the learning process, aiming to enhance their ability to identify and resolve challenges encountered during long jump practice. This model promotes teamwork, discussion, and scientific exploration, thereby strengthening students' understanding of long jump techniques. Through this approach, students not only learn to perform physical movements but also sharpen essential cognitive skills such as analysis, evaluation, and decision-making. Another benefit of SGIL is its ability to increase student motivation and interest in learning, as they feel more involved in the process. The implementation of SGIL in long jump learning can be carried out by dividing students into small groups, assigning tasks to plan training strategies, and encouraging them to discuss and provide feedback on the techniques applied. Thus, the application of the SGIL model is expected to positively contribute to enhancing students' problem-solving abilities as well as their physical skills in long jump.

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