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KOKEMAN Game Model Effectiveness in Enhancing Elementary Students' Learning Interest

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Keywords

learning interests; game models; physical education; meaningful education

Abstract

Low participation in physical activity is a global issue that is often rooted in the failure of conventional Physical Education (PJOK) in building students' interest in learning from an early age. This study aims to analyze the influence of the physical fitness collaboration game model (KOKEMAN) on PJOK learning interest in elementary school students. The research method used was a quasi-experiment with a non-equivalent control group design involving 20 grade V students at SDN Rancakalong. Interventions were carried out in 14 meetings with tested protocols. Data was collected through a validated interest questionnaire with an expert judgment score of 94% and a reliability of 0.801. The results of the Paired Samples T-Test showed a very significant increase in the experimental group with a significance value (p=0.000). Furthermore, analysis of the N-Gain score showed that the experimental group achieved an increase of 48% in the medium category, far exceeding the control group which only reached 10% in the low category. In conclusion, Kokeman's game model has proven to be effective in significantly increasing students' interest in learning through the creation of a joyful learning environment. These findings confirm that the integration of structured play elements from an early age is a crucial preventive step to prevent understanding gaps and low interest in movement that can persist into adulthood.

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INTRODUCTION

The phenomenon of lack of physical activity at the elementary school level is now a global public health challenge that affects the physical, mental, and cognitive aspects of students. Recent studies highlight the strategic role of school policies in facilitating physical activity through curriculum modifications and learning practices, which allow for synergy between physical movement and the achievement of academic targets without adding to the curricular burden (Gray et al., 2021) However, the success of the strategy is highly dependent on internal student factors, where low interest in learning is now identified as the main trigger for declining physical participation in school. The unavailability of strong interests causes students to tend to be passive in participating in PJOK learning, which ultimately has a direct impact on a significant decrease in their physical fitness levels (Mustafa & Sugiharto, 2020)

The gap between curriculum policies and the reality of student behavior is clearly illustrated through a survey at SDN Rancakalong, Sumedang. The results of the observation showed that the physical activity of students was in the low category, which was characterized by a lack of involvement in PJOK learning sessions. Instead of participating in physical activity, most students exhibit passive behavior by choosing to play in the classroom and ignoring instructional direction from the exercise teacher. This behavior is empirical evidence that low interest in learning is the main inhibiting factor in optimizing physical learning in the school (Haykin & Rolls, 2021) Although there were constraints in the interest aspect, further observation showed a significant change in response when learning was carried out through a game technique approach. Students who previously tended to be passive began to show higher enthusiasm and active involvement in each movement session (Yuliastrid et al., 2022) This phenomenon indicates that playful learning methods are crucial stimulants for elementary school students. This is emphasized by the view (Maesara et al., 2023) which states that the proper use of games can increase student motivation, interest, and participation in PJOK, thereby contributing to improving physical fitness as well as character development and health literacy. Based on these arguments, this research is focused on optimizing game models as a preventive effort against the decline of students' physical quality.

In an effort to optimize student participation at SDN Rancakalong, the researcher constructed the KOKEMAN (Physical Fitness and Manipulative Collaboration) game model. This model is specifically designed to integrate physical fitness components with basic manipulative skills to create a more dynamic and functional learning atmosphere (Bramantoro et al., 2020) To understand this foundation, physical fitness is viewed as the body's capacity to complete daily activities efficiently without experiencing undue exhaustion, encompassing cardiovascular endurance, muscular strength, agility, and coordination. By providing structured challenges and autonomy within the game, this model encourages students to be more courageous and persistent when facing physical tasks (Syaputra & Warni, 2023) This definition is in line with the common understanding in the PJOK literature that physical fitness is the main foundation for students' mobility ability, academic performance, and holistic well-being (Kluttig et al., 2020) Beyond the fitness dimension, manipulative skills serve as a fundamental movement component in elementary physical education, requiring students to master the coordination of their body with external objects. This manipulative activity involves the purposeful use of tools such as balls, bats, or ropes, which are essential for developing gross motor skills, precise body control, and the ability to handle objects with accuracy (Mayhew et al., 2019) The PJOK literature shows that the development of these skills not only improves motor skills, but also contributes to improved focus, concentration, social skills, and health literacy, especially when combined in a game-based learning design and an integrated curriculum (Setyawan & Lumintuarso, 2021)

A number of previous studies have provided a solid foundation on the effectiveness of innovative learning models in improving students' physical and psychological parameters. (Omojor-Oche et al., 2025) Through qualitative studies in the UK, it was identified that physical activity barriers in school-age children are often caused by a less supportive environment and a lack of variety of exercise. These findings emphasize the importance of fun and varied interventions to build students' active motivation. In the context of fitness, (Salahuddin et al., 2023) proving that the sports game model significantly improves the physical fitness and motivation of students in Indonesia, where experimental results show a consistent increase in

average scores after eight meetings. This is in line with the findings (Chu et al., 2022) in China, which through quasi-experimental methods has found that the modern sports education model is far superior in increasing learning motivation, affection, and learning behavior compared to traditional methods that tend to be monotonous. Furthermore, focusing on specific movement skills also showed positive results. (Pratiwi et al., 2024) successfully developed a model of manipulative motion games of throwing and catching with an N-gain effectiveness rate of 75.73% in early childhood. In line with this, (Syaputra et al., 2023) applying the Problem-Based Learning (PBL) model in Classroom Action Research which has been proven to be effective in increasing the completeness of the manipulative abilities of elementary school students to reach a score above 86% in the second cycle.

This research offers novelty through two main contributions that distinguish it from previous studies. First, the study integrated the domains of physical fitness and manipulative skills simultaneously into a single instructional framework called the Kokeman Game Model. This integrated approach departs from the practical finding that synergy between physical capacity and object coordination can be an effective stimulant to increase interest in learning, a variable that is still limited to being explored in depth. Second, in contrast to the majority of studies that focus solely on physical outcomes, this study specifically examined the influence of the model on the affective aspects of students. By offering a comprehensive perspective, this study aims to make a new contribution on how the integration of physical activity and basic movement skills can be transformed to increase students' motivation and involvement in PJOK learning.

Based on the identification of these problems, this study is focused on examining the significant influence of the implementation of a game model that integrates aspects of physical fitness and manipulative skills on students' learning interests. Specifically, this study aims to analyze the extent of the contribution of each of these aspects, either independently or through integrated collaboration in the Kokeman Game Model, in increasing the interest in learning PJOK in grade V students at SDN Rancakalong. The hypothesis in this study is that there is a significant influence of the implementation of physical fitness aspects and manipulative skills, either partially or simultaneously through the Kokeman Game Model, on the PJOK learning interest of grade V students of SDN Rancakalong.

METHODS

This study uses a quantitative approach with a quasi-experimental method. This approach was chosen to test the cause-effect relationship between intervention variables and bound variables in groups that have been naturally formed in the school environment. The research design applied is Non-equivalent Control Group Design. The research instrument is in the form of a learning interest questionnaire adapted from (Chu et al., 2022), consists of 20 statements with a five-point Likert Scale. This instrument has been declared "Very Valid" through the expert judgment test (94%) and is reliable based on the Cronbach's Alpha test with a coefficient value above 0.60 (Sugiyono, 2020) The subject of the study is a grade V student of SDN Rancakalong, Sumedang Regency. The sample consisted of 20 students divided into two groups: 10 students as an experimental group and 10 students as a control group. The sampling technique used purposive sampling to ensure the equivalence of the participants' motor characteristics in the age range of 8–12 years.

The type of data used is primary quantitative data. This data includes student learning interest scores obtained directly through questionnaire instruments, both before treatment (pre-test) and after treatment (post-test). The data collection process was carried out for 14 meetings. The stages began with the administration of pre-tests to both groups, followed by the administration of treatment in the form of the KOKEMAN Game Model to the experimental group during the intervention period, and ended with the administration of post-tests to measure the final results. Data analysis was carried out using descriptive and inferential statistics. Prerequisite tests include the Shapiro-Wilk normality test and the homogeneity test. Hypothesis testing was carried out through Paired Samples T-Test and Independent Sample T-Test using the help of SPSS software to determine the significance of the influence of the model partially or simultaneously.

$$N\ Gain = \frac{Skor\ Posttest - Skor\ Pretest}{Skor\ Ideal - Skor\ Pretest}$$

Figure 1. Normalized Gain Score Formula (Sundayana & Pd, 2019)

RESULTS AND DISCUSSION

Data from the measurement of learning interest in the experimental group and the control group were collected through questionnaire instruments given before (pre-test) and after (post-test) intervention. Descriptive statistical analysis was carried out to provide an overview of the characteristics of data distribution which included mean values, standard deviations (SD), and minimum and maximum scores. A summary of the comparison of measurement results from the two research groups is presented in **Table 1** below:

Table 1. Descriptive Statistical Results

Groups	Tests	N	Min	Max	Red	Std. D
Experiments	Pretest	10	50	66	58,4	5,72
	Postest	10	70	85	78,3	4,08
Controls	Pretest	10	52	65	58,1	3,81
	Postest	10	55	68	62,2	4,10

The initial stage in inferential analysis is to conduct a prerequisite test to ensure that the collected data has a normal distribution. This normality test is crucial because it determines whether further hypothesis testing can use parametric or non-parametric statistics. Given the relatively small sample size in this study, namely 10 students per group ($n < 50$), the most accurate testing technique to use is the Shapiro-Wilk test. The testing criteria are set at a significance level of $\alpha = 0.05$, where the data is declared normally distributed if the significance value (p-value) obtained is greater than 0.05 ($p > 0.05$). A summary of the results of the normality test for the variable interest in learning physical education is presented in **Table 2** below:

Table 2. Results of the Normality Test of Interest in PJOK

Groups	Tests	Statistics	df	Sig.	Conclusion
Experiments	Pretest	0,875	10	0,115	Normal
	Postest	0,878	10	0,124	Normal
Controls	Pretest	0,854	10	0,146	Normal
	Postest	0,909	10	0,273	Normal

Based on **Table 3**, the results of the Independent Sample T-Test showed a significance value (2-tailed) of 0.497. Statistically, the score was greater than the 0.05 level (0.497 > 0.05), indicating that there was no significant difference in average learning interest between the experimental group and the control group at post-test. This is thought to be due to the fact that the control group also experienced a slight increase in interest naturally during the conventional learning process.

Table 3. Independent Sample T-test Results

Variable	F	Sig.	t	df	Sig. (2-tailed)
Interest in Learning	7,946	0,011	-0,693	18	0,497

However, to see the extent of the effectiveness of Kokeman's game model specifically in the group given treatment, further analysis was carried out using the Paired Samples T-Test. Based on **Table 4**, the results of the Paired Samples T-Test showed a significance value of 0.000 ($p < 0.05$). This proves that there was a very significant increase in learning interest in the experimental group students after being treated with the Kokeman game model. Thus, this model has been shown to be effective in increasing student enthusiasm from the initial condition before the intervention is given.

Table 4. Paired Sample T-test Results

Variable	Mean Difference	t	df	Sig. (2-tailed)
Pretest-Postest	-12,700	-5,837	9	0,000

In order to measure the extent of the effectiveness of the Kokeman game model in stimulating a significant increase in students' interest in learning, a Normalized Gain (N-Gain) analysis was conducted. This test provides a more comprehensive picture of the deviation of score improvement between the pre-test and the final score (post-test) in both study groups. Based on the results of the data computation, it was found that the experimental group showed a much more progressive improvement trend compared to the control group. The effectiveness of Kokeman's model is reflected in the average N-gain value obtained in the "Medium" category, while conventional learning in the control group only shows an increase in the "Low" category. Methodologically, this difference in achievement confirms that the intervention through the Kokeman game model has a stronger carrying capacity for the growth of students' PJOK learning interest in elementary school. A summary of the results of the effectiveness analysis is presented in the following **Table 5**:

Table 5. N-Gain Learning Interest Score Results

Groups	N-Gain	Percentage	Categories
Experiments	0,48	48%	Medium
Controls	0,10	10%	Low

The findings of this study show that the application of the Kokeman game model has a significant impact on increasing students' PJOK learning interest. Although the results of the intergroup test did not show a drastic difference at the end of the session, the internal improvement in the experimental group with a significance value of 0.000 and an N-Gain score of 48% proved the effectiveness of this intervention. This success is inseparable from the duration of 14 meetings which allows the strengthening of cognitive mechanisms and gradual changes in learning habits, so that students have enough time to adapt to new movement patterns without feeling pressured. The peculiarity of the Kokeman model lies in the integration between the components of physical fitness and manipulative movement skills packaged in a competitive game format. This collaboration creates an "optimal challenge" that is able to trigger students' emotional engagement simultaneously. In line with theory (Rantala et al., 2016) The unification of various elements of movement in a pleasant atmosphere has been proven to be effective in minimizing cognitive saturation and increasing students' self-efficacy in mastering complex skills.

In addition, the dynamic game design is able to transform repetitive practice patterns into an enthusiastic learning experience. These results also support the urgency of developing interests from an early age to prevent long-term adverse impacts. As stated by (Bogdanic et al., 2026), perceptions and interests formed at a young age greatly determine the level of literacy and understanding of the individual in the future. If interest in learning is not triggered through innovative learning models from elementary school, these gaps in understanding can persist into adulthood and hinder an active lifestyle. Thus, the Kokeman model acts as a strategic bridge to ensure students continue to have a positive connection to physical activity on an ongoing basis.

CONCLUSION

Based on the results of data analysis and findings in the field, it can be concluded that the implementation of the Kokeman game model has proven to be effective in significantly increasing students' interest in learning PJOK in elementary schools. This effectiveness was shown by a very noticeable increase in scores in the experimental group with a significance value of 0.000, as well as an N-Gain Score of 0.48 which placed this model in the "Moderate" improvement category. The success of this intervention was supported by the use of research instruments that had met the feasibility standards through an expert validity test of 94% and a very strong reliability level of 0.801. Practically, the Kokeman model contributes as a learning innovation that is able to create a joyful learning atmosphere, so it is highly recommended for PJOK teachers to overcome the low enthusiasm of students in physical activities. However, the study has limitations on a limited number of samples, so it is recommended for future researchers to replicate in a wider population to test the consistency of the effectiveness of this model over a longer period of time.

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