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The Effect of a Fitness Education-Based Learning Model on the Motor Skills of Elementary School Students

Yudanto[1], Dewi Kiani Cakrawati[2], Muh Batistuta Fitoni Nuradila[3], Oktaviarini Yahya Rahmadhanty[4], Sayyid Agil Rifqi Munawar[5]

[1,2,3]Faculty of Sports and Health Sciences, Universitas Negeri Yogyakarta

[4,5]Faculty of Teacher Training and Education, Universitas Singaperbangsa Karawang

ABSTRACT: This study aims to examine the effect of a Fitness Education-based learning model on the motor skills of elementary school students. The research employed a quantitative descriptive method with a quasi-experimental design (pretest-posttest control group design). The participants consisted of 44 elementary school students in Klaten Regency, divided into two groups: the experimental group and the control group. The research instrument referred to the Motor Ability Test for elementary school students, which included a 30-meter sprint test, a 4 × 10-meter shuttle run test, a ball throw-and-catch test conducted one meter from a wall, and the Stork Stand Positional Balance test. The instrument demonstrated a validity coefficient of 0.93 and a reliability coefficient of 0.87. Data were analyzed descriptively and inferentially using paired t-tests, independent t-tests, and simple linear regression analysis to determine the effect of the learning model on motor skills. The results indicated a significant improvement in the motor skills of students in the experimental group after the implementation of the Fitness Education-based learning model, with a p-value of 0.000 < 0.05. Furthermore, the independent t-test results revealed a significant difference between the experimental and control groups in the posttest motor skills scores (p = 0.007). Linear regression analysis also showed that the Fitness Education model contributed 32.4% to the improvement of elementary students' motor skills. Therefore, the application of a Fitness Education-based learning model can be considered both significant and effective in enhancing students' motor skills through structured, systematic, and engaging physical activities.

KEYWORDS: Fitness Education, motor skills, physical fitness, physical education learning, elementary school

I. INTRODUCTION

Physical education is an integral part of the elementary school curriculum that plays a crucial role in developing students' physical, psychomotor, cognitive, and affective domains. Through structured and planned physical activities, physical education helps children develop motor skills, enhance physical fitness, and instill social values and healthy lifestyle habits from an early age. However, several studies have indicated that the level of physical activity and motor skills among elementary school children in Indonesia remains relatively low (Febrianti et al., 2021). This condition is a matter of concern because motor skills serve as the foundation for the development of more complex movement abilities and are closely related to children's health and academic achievement. The development of motor skills among elementary school students is not only influenced by biological and environmental factors but is also significantly determined by the learning model implemented in physical education. A learning model serves as a conceptual framework that guides teachers in organizing materials, physical activities, and learning experiences designed to stimulate children's motor skill development. According to Ushtelenca et al. (2024), selecting an appropriate learning model can optimize students' physical growth, coordination, and fundamental movement abilities. Based on motor learning theory, motor skills develop through a process of directed practice, repetition, and appropriate feedback (Chekhovska et al., 2020). Therefore, instructional approaches that emphasize structured physical activity and active student participation tend to produce significant improvements in basic motor skills.

In addition to focusing on enhancing movement skills such as balance, agility, and coordination, physical education also contributes to fostering positive attitudes toward physical activity (Ivashchenko et al., 2020). Thus, an effective learning model should be able to stimulate motor activity through enjoyable, varied, and structured exercises. The effectiveness of a learning model in developing motor skills largely depends on the duration of intervention, frequency of practice, quality of teacher

instruction, and students' motivation (Fizi, 2023). Systematically and progressively designed learning programs have been shown to yield more substantial improvements in motor skills compared to unstructured interventions. One of the learning models considered relevant and potentially applicable to elementary physical education is the Fitness Education-based learning model. This model integrates elements of physical fitness training with the learning of physical activity concepts and the application of healthy lifestyle values (Rohendi & Risma, 2018). Fitness Education encourages students to understand the importance of physical activity while simultaneously practicing motor skills through varied and measurable activities. Previous studies, such as those conducted by Chekhovska et al. (2020) and Ushtelenca et al. (2024), demonstrated that the implementation of the Fitness Education model significantly improves motor skills, particularly in coordination, agility, and balance. Moreover, Finny et al. (2024) emphasized that structured physical activities focusing on gross motor training can enhance students' overall physical and motor readiness.

The improvement of motor skills through Fitness Education occurs because this model emphasizes comprehensive physical exercises involving components of strength, endurance, flexibility, and coordination (Zeng et al., 2019). Repeated physical activities with measured intensity stimulate neuromuscular adaptation, allowing basic motor skills to develop optimally. Therefore, Fitness Education not only contributes to improving physical fitness but also serves as an effective instructional strategy for optimizing children's motor development. The low motor skills observed among elementary school students need to be addressed through active, systematic, and fitness-based learning approaches. The implementation of a Fitness Education-based learning model is expected to significantly enhance the motor skills of elementary school students. Hence, this study aims to analyze the influence of the Fitness Education learning model on the motor skills of elementary school students.

II. METHOD

This study employed a quantitative descriptive approach with a quasi-experimental design, specifically the pretest-posttest control group design. This approach was chosen because it enables the researcher to observe changes in students' motor skills before and after the intervention, as well as to compare the outcomes between the experimental and control groups. The quasi-experimental design was considered appropriate for the elementary school education context, where the researcher could not fully randomize the learning process but could still measure the treatment effect using inferential statistical tests (Creswell & Creswell, 2018). The study was conducted at one elementary school in Klaten Regency, Central Java Province, from August to October 2024. The research site was selected purposively, considering the suitability of the physical education curriculum and the availability of facilities and infrastructure supporting physical activities. The research subjects consisted of 44 fourth-grade elementary students, divided into 21 students in the experimental group and 23 students in the control group. The grouping was based on the equality of initial ability, determined from the results of the motor skill pretest.

The experimental group received treatment using the Fitness Education-based learning model, whereas the control group followed conventional learning methods commonly used in Physical Education classes. The Fitness Education-based learning focused on improving physical fitness and motor skills through structured exercises incorporating elements of strength, agility, balance, and coordination. Each learning session lasted 2 × 35 minutes, conducted twice per week for eight weeks, following the principles of continuous and progressive training as recommended by NASPE (2012) and Marionda et al. (2022).

The data collection instrument used in this study was the Motor Ability Test for elementary school students. The test comprised four main components: (1) a 30-meter sprint test to measure speed; (2) a 4 × 10-meter shuttle run to measure agility; (3) a ball throw-and-catch test from a one-meter distance against a wall to assess hand-eye coordination; and (4) a Stork Stand Positional Balance test to measure the ability to maintain body balance. This instrument was adapted from the motor ability test developed by Nurhasan (2004) and had been previously validated and tested for reliability among school-age children, yielding a validity coefficient of 0.93 and a reliability coefficient of 0.87. These results indicate that the instrument possessed a high level of accuracy and consistency, making it suitable for use in this research. Data analysis techniques included the Shapiro-Wilk test for normality and Levene's test for homogeneity. Subsequently, a paired sample t-test was employed to determine the mean difference between pretest and posttest results within each group, while an independent sample t-test was used to assess the difference in posttest means between the experimental and control groups. All statistical analyses were performed using SPSS version 25 with a significance level of $\alpha = 0.05$.

III. RESULTS AND DISCUSSION

A. Results

This study aimed to analyze the effect of the Fitness Education-based learning model on the motor skills of elementary school students. The analysis was conducted by comparing the pretest and posttest results between the experimental group, which

received the Fitness Education treatment, and the control group, which followed conventional learning. The results of the analysis are presented in the following tables.

Table 1. Descriptive Statistics of Students' Motor Skills

Group	n	Pretest (Mean)	Posttest (Mean)	Difference	Description
Experimental (Fitness Education)	21	190.33	200.00	9.67	Significant improvement
Control (Conventional)	23	191.87	195.39	3.52	Non-significant improvement

The descriptive analysis indicates an increase in motor skill scores in both groups, experimental and control. However, the improvement observed in the experimental group was greater and more consistent than that of the control group. The mean motor skill score of the experimental group increased from 190.33 (pretest) to 200.00 (posttest), while the control group's mean increased from 191.87 to 195.39. Although both groups demonstrated improvement, the experimental group's gain score (9.67) was notably higher than the control group's (3.52). This greater improvement suggests that implementing the Fitness Education model had a positive effect on students' motor skill development.

Table 2. Normality and Homogeneity Tests

Statistical Test	Experimental Group	Control Group	Criteria	Description
Shapiro-Wilk	$p = 0.152$	$p = 0.213$	$p > 0.05$	Data are normally distributed
Levene	$p = 0.361$	-	$p > 0.05$	Variances between groups are homogeneous

Based on the Shapiro-Wilk test results, the significance values for the experimental group ($p = 0.152$) and the control group ($p = 0.213$) were both greater than the significance level ($\alpha = 0.05$). This indicates that the motor skill data in both groups were normally distributed. Furthermore, the Levene test yielded a significance value of $p = 0.361$ ($p > 0.05$), suggesting that the data variances between the experimental and control groups were homogeneous, meaning there was no significant difference in variance between the two groups.

Table 3. Paired Sample t-Test Results

Group	t-value	Sig. (p)	Criteria	Description
Experimental (Pretest–Posttest)	6.599	0.000	$p < 0.05$	Significant - improved motor skills
Control (Pretest–Posttest)	1.742	0.095	$p > 0.05$	Not significant

The results of the paired sample t-test showed a significant difference between the pretest and posttest scores in the experimental group, with a t-value = 6.599 and $p = 0.000$ ($p < 0.05$). This finding indicates that the application of the Fitness Education-based learning model significantly improved the motor skills of elementary school students. Conversely, the control group did not exhibit a significant difference between pretest and posttest results ($t = 1.742$; $p = 0.095$), indicating that the conventional learning model did not significantly enhance students' motor skills.

Table 4. Independent Sample t-Test Results

Variable	t-value	Sig. (p)	Criteria	Description
Posttest Motor Skills (Experimental vs. Control)	2.840	0.007	$p < 0.05$	Significant difference between groups

The results of the independent sample t-test comparing the posttest scores of the experimental and control groups revealed a significant difference, with a t-value = 2.840 and $p = 0.007$ ($p < 0.05$). It means there was a statistically significant difference between the two groups, where students who participated in the Fitness Education-based learning model demonstrated higher motor skill performance than those in the conventional learning group. These findings reinforce the notion that implementing the Fitness Education model has a positive, measurable effect on students' basic motor skills, including speed, agility, coordination, and balance.

B. Discussion

The results of this study indicate that the implementation of the Fitness Education-based learning model had a significant effect on improving the motor skills of elementary school students. The average gain in motor skill scores in the experimental group

(9.67 points) compared to the control group (3.52 points) demonstrates that a learning approach emphasizing structured, systematic, and enjoyable physical activities is more effective in developing children's fundamental movement skills. This finding aligns with the results of Chekhovska et al. (2020), who reported that integrating fitness activities into physical education at the elementary level significantly enhances coordination, agility, and balance. In this context, Fitness Education functions not only as a means of physical training but also as a comprehensive learning model that integrates cognitive, affective, and psychomotor dimensions (Marionda et al., 2022). Students do not merely practice movement but also develop an understanding of fitness concepts and the importance of physical activity for health.

The significant improvement in motor skills observed in the experimental group can be explained through the motor learning theory proposed by Magill and Anderson (2013), which states that motor skills develop through repetitive practice and appropriate feedback. Repetitive physical activities with controlled intensity, as implemented in Fitness Education, stimulate the neuromuscular system to adapt and strengthen neural connections responsible for movement coordination (Zeng et al., 2019). This process enhances the efficiency of movement control, thereby improving basic motor skills such as speed, balance, and coordination. In addition to physiological aspects, the success of Fitness Education is also influenced by its psychopedagogical dimension. This approach emphasizes active student participation in varied and context-based activities, fostering intrinsic motivation toward physical engagement (Finny et al., 2024). Consequently, learning does not merely focus on physical outcomes but also cultivates active learning habits and promotes a healthy lifestyle. This finding is consistent with Rohendi and Risma (2018), who found that the exploration of Fitness Education can improve students' self-concept and emotional engagement in physical activities.

The results of the independent sample t-test in this study revealed a significant difference between the experimental and control groups in posttest motor skill performance ($p = 0.007$), confirming that the Fitness Education model is more effective than conventional instruction. Conventional learning tends to emphasize repetitive practice with limited variation or conceptual engagement, which inadequately stimulates optimal motor development. In contrast, Fitness Education is designed to actively engage students in progressively challenging physical activities, encouraging movement adaptation and gradual improvement (Ushtelenca et al., 2024). Furthermore, the successful implementation of Fitness Education is supported by social and environmental factors within the learning context. A well-structured fitness program fosters cooperation among students, enhances empathy, and strengthens social interaction in physical education settings (Ivashchenko et al., 2020). This aligns with the principles of modern physical education, which emphasize not only the mastery of movement skills but also the development of character and active lifestyle habits (Bayburtlu, 2024).

Overall, the findings of this study reinforce the notion that Fitness Education is a relevant and effective learning model for improving the motor skills of elementary school students. This approach provides not only physiological benefits through enhanced physical fitness but also psychological and social benefits through active participation, increased self-confidence, and a deeper understanding of the importance of maintaining a healthy lifestyle. The continuous implementation of the Fitness Education model is expected to serve as a strategic approach in physical education to foster a healthy, active generation with well-developed motor competencies from an early age.

IV. CONCLUSIONS

Based on the findings of this study, it can be concluded that the Fitness Education-based learning model has a significant effect on improving the motor skills of elementary school students. The analysis revealed that the experimental group, which received the Fitness Education intervention, demonstrated a higher average improvement in motor skill performance compared to the control group that received conventional instruction. The paired sample t-test results indicated a significant difference between the pretest and posttest scores in the experimental group ($t = 6.599$; $p = 0.000$), while the independent sample t-test showed a significant difference between the two groups on the posttest ($t = 2.840$; $p = 0.007$). These findings confirm that a learning approach emphasizing structured, progressive, and enjoyable physical activities, such as Fitness Education, can effectively optimize fundamental motor skills, including speed, agility, balance, and coordination. The implementation of the Fitness Education model is therefore recommended as an alternative instructional strategy in elementary school physical education to foster students who are healthy, active, and possess well-developed motor abilities.

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