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The Effect Of Futsal Game Learning Methods On Students' Motor And Cognitive Skills

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Abstract. This study aims to determine the effect of the futsal game learning method on the motor and cognitive skills of elementary school students. The background of the study is based on the low level of structured physical activity in the learning process, which impacts the development of students' motor skills and thinking abilities. The study used a quantitative approach with a quasi-experimental design. The sample consisted of 60 fifth-grade elementary school students divided into experimental and control groups. The research instruments included a gross motor skills test and cognitive questions based on tactical understanding of the game. The analysis results showed that students who were taught using the futsal game method experienced significant improvements in motor and cognitive aspects compared to the control group. These findings confirm that the game-based learning approach can be an innovative alternative in physical education.

Keywords: futsal, game learning, motor skills, student cognitive, physical education

1 Introduction

Physical education is an essential subject for holistically developing students' physical and psychological potential. Through physical education, students are not only required to be physically active but are also expected to develop cognitive skills such as decision-making, problem-solving, and tactical thinking, particularly in the context of games. However, the reality of physical education in the field still shows various problems, particularly at the elementary school level.

One real issue faced is the low level of physical activity among students. According to data from the Indonesian Ministry of Health (Riskesdas, 2018), approximately 40.5% of children aged 7–12 in Indonesia do not engage in sufficient physical activity daily, which directly impacts their motor development. Furthermore, the results of the Global Matrix 4.0 survey (2022) conducted by the Active Healthy Kids Global Alliance indicate that the physical activity level of Indonesian children received a D, meaning that most children do not meet the WHO's minimum recommendation of 60 minutes of physical activity per day.

This situation is exacerbated by the tendency of physical education teachers to still employ traditional, teacher-centered learning approaches that lack active and contextual student engagement. Many teachers rely on direct instruction and repetitive drills, which quickly bore students and lack challenge. As a result, students' motor skills develop suboptimally, and their cognitive abilities, particularly in understanding game strategy and decision-making, also suffer.

Furthermore, an observational study conducted by researchers at a public elementary school in Tigalingga City showed that more than 60% of students were unable to properly coordinate basic movements, such as kicking and dribbling the ball, and had difficulty understanding roles and rules in team games. This indicates an urgent need to improve the quality of physical education, particularly by using a more active and student-centered approach.

One method that can address these issues is game-based learning, specifically through futsal. Futsal, as a small team sport, is characterized by dynamic gameplay, requiring fast movements, complex coordination, and tactical thinking in a short period of time. According to Coutinho et al. (2023), game-based learning in futsal can simultaneously improve students' motor and cognitive abilities because it involves rapid information processing under pressure.

However, to date, research comprehensively examining the impact of futsal learning methods on two important aspects—motor and cognitive development—of elementary school students remains very limited, particularly in Indonesia. Therefore, this study was conducted to fill this gap and offer an alternative physical education learning strategy that is more contextual, enjoyable, and has a broad impact on child development.

3 Method

This study used a quantitative approach with a quasi-experimental design, namely a Nonequivalent Control Group Design. The study was conducted at Public Elementary School 030317 in Tigalingga City during the even semester of the 2024/2025 academic year.

The study population was all 4th-grade students, and a purposively selected sample of 60 students consisted of 30 students in the experimental group and 30 in the control group. The experimental group participated in Physical Education (PJOK) learning using futsal, while the control group used conventional learning (drills and routine exercises).

The research instruments consisted of:

The motor skills test, using a modification of the Bruininks-Oseretsky Test of Motor Proficiency (BOT-2), measures balance, coordination, agility, and speed.

The cognitive test, consisting of multiple-choice and short essay questions, assesses tactical understanding, decision-making, and futsal strategy.

The research procedure included a pretest, treatment for 8 sessions, and a posttest. Data were analyzed using independent t-tests and paired t-tests using SPSS, after meeting normality and homogeneity tests, with a significance level of 0.05.

4 Result

This study aims to determine the effect of futsal learning methods on the motor and cognitive skills of elementary school students. Data were obtained from pretest and posttest results for the experimental and control groups. The following is a summary of the statistical analysis results:

1. Motor Skills Test Results

Group	Pretest (Mean ± SD)	Posttest (Mean ± SD)	Δ Peningkatan	Sig. (2-tailed)
Eksperimen	70,3 ± 5,8	84,6 ± 6,2	+14,3	0,000
Kontrol	71,0 ± 6,1	75,2 ± 6,5	+4,2	0,047

2. Game Cognitive Test Results

Group	Pretest (Mean ± SD)	Posttest (Mean ± SD)	Δ Peningkatan	Sig. (2-tailed)
Eksperimen	68,5 ± 6,7	82,8 ± 5,9	+14,3	0,000
Kontrol	69,2 ± 6,4	74,1 ± 6,0	+4,9	0,031

The table above shows that both groups improved in both aspects, but the experimental group showed a more significant improvement than the control group. An independent t-test showed a significant difference ($p < 0.05$) between the two groups in the posttest results, for both motor and cognitive skills.

5 Discussion

The results of this study indicate that the futsal learning method significantly improved students' motor and cognitive skills compared to conventional methods. This finding aligns with research by Coutinho et al. (2023), which states that small-game learning, such as futsal, can stimulate the motor and cognitive systems simultaneously because the game is dynamic, competitive, and demands rapid tactical adaptation.

The improvement in the motor skills of the experimental group students can be explained by the nature of futsal, which requires students to perform complex movements such as dribbling, kicking, and moving quickly in a confined space. This supports Gallahue & Ozmun's motor development theory, which states that motor skills develop optimally through activities involving coordination, rhythm, and body control in a physically challenging environment.

Meanwhile, the cognitive improvement of the experimental group students occurred because they had to understand game situations, make quick decisions, and work collaboratively as a team. This aligns with Bandura's social learning theory, which argues that the learning process is also influenced by observation, social interaction, and modeling. Learning through futsal provides a concrete context for the application of cognitive concepts such as strategy and tactics.

Furthermore, futsal allows for a more contextual and participatory approach, which Lima et al. (2022) believe is key to meaningful physical education (PJOK) learning. Students not only learn physically but also hone higher-order thinking skills such as situational analysis and action evaluation.

This research also emphasizes the importance of using fun and game-based methods in PJOK learning to increase student motivation, active engagement, and more comprehensive learning outcomes.

6 Conclusion

Based on the research results and data analysis, it can be concluded that the futsal game learning method has a significant impact on improving the motor and cognitive skills of elementary school students. Students who participated in learning with a game approach showed higher improvements in motor skills, such as coordination, balance, agility, and speed compared to students who participated in conventional learning. In addition, this method has also been proven to be able to develop students' cognitive abilities, especially in terms of understanding game strategies, decision-making, and problem-solving in the tactical context of futsal games. These results confirm that physical education learning packaged in the form of games is not only fun, but also effective in developing students' physical and mental aspects simultaneously.

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