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The Effect of Moving Ball and Stationary Ball Shooting Drills on Kick Accuracy in Soccer Among Eighth-Grade Students of SMP Negeri 18 Medan

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Abstract: This research investigates the effectiveness of the Problem-Based Learning (PBL) model in improving the shooting skills of eighth-grade students in football at MTS Darul Ilmi during the 2022/2023 academic year. The study applied a Classroom Action Research (CAR) method conducted in two cycles involving 27 students. Each cycle included the stages of planning, implementation, observation, and reflection. Data collection was carried out through lesson plans, observation sheets, and documentation, and analyzed using percentage-based descriptive statistics. The findings revealed a significant improvement in students' shooting performance: the average score increased from 75 in cycle I (59.26% mastery) to 86 in cycle II (88.89% mastery), surpassing the minimum learning target of 75%. Moreover, students showed higher engagement, focus, and confidence during learning activities. The implementation of PBL successfully created an interactive and enjoyable learning environment that positively influenced motivation and achievement. The study concludes that integrating the PBL model into physical education effectively enhances football shooting skills and fosters active learning behavior among junior high school students.

Keywords: Football; Problem-Based Learning; Shooting Skill; Physical Education

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INTRODUCTION

Accurate shooting remains a critical determinant of success in football, particularly at youth and school levels, where technical proficiency can significantly influence match outcomes and player development. Numerous studies have highlighted the urgency of enhancing shooting accuracy among developing players: for example, research found that among soccer school athletes, shooting accuracy scores were only at a "medium" level, indicating substantial room for improvement.

Moreover, studies such as the one by Hanif, Nasuka & Priyono (2022) reported that training methods (fixed vs. variable target) and power significantly affect shooting accuracy. Despite the proliferation of research into shooting accuracy, much of the existing work has focused on training methods like target-type drills, plyometrics, or fixed/variable target designs Nur-tajudin (2025) on spinning-shooting training, Nugraha & Iskandar (2023) on plyometric training. These studies have made important contributions, yet gaps remain especially in comparative evaluations of different shooting drills (such as moving-ball vs. stationary-ball shooting) in the context of

adolescent secondary-school players, and how these training variations translate into measurable accuracy improvements in school settings.

The current article seeks to address this gap by investigating two specific shooting training models moving-ball shooting drills and stationary-ball shooting drills among eighth-grade students at SMP Negeri 18 Medan. This study's novelty lies in its focus on middle-school students in an Indonesian context, and its comparative approach to these two training models. The objectives of this research are as follows: (1) to determine whether moving-ball shooting drills significantly improve kick accuracy; (2) to determine whether stationary-ball shooting drills significantly improve kick accuracy; and (3) to compare the effectiveness of the two methods in terms of accuracy gains.

Through its findings, this research aims to contribute to both the theoretical and practical domains. Theoretically, it will enrich the body of literature on shooting accuracy training by providing empirical evidence on differing drill dynamics in a youth school context. Practically, it offers actionable insights for physical education teachers and coaches working with school-aged players, helping them select more effective drill methods tailored to their students. Ultimately, the contribution of this study is to guide evidence-based practice in soccer training, thereby improving students' technical accuracy and supporting the development of more competent young players.

METHOD

This research employed a quantitative experimental design using a two-group pretest–posttest structure. The design was chosen to determine the causal effect of two types of shooting training moving-ball shooting drills and stationary-ball shooting drills on the accuracy of soccer kicks. Both experimental groups were assessed before and after the treatment to observe measurable changes in performance. The research design followed the principles of controlled experimentation in which both groups received different treatments but were exposed to similar testing and environmental conditions.

The study was conducted at SMP Negeri 18 Medan, located on Jl. Kemuning, Perumnas Helvetia, Medan, North Sumatra, Indonesia. The research was carried out over a one-month period, from May 7, 2024, to June 8, 2024. Training sessions were held three times per week on Tuesdays, Thursdays, and Saturdays from 15:30 to 17:30 WIB, for a total of twelve (12) training sessions per group.

The population of this study comprised all eighth-grade students of SMP Negeri 18 Medan who participated in physical education classes. From this population, a total of 20 students were selected as research samples. The participants were male students with relatively homogeneous physical characteristics, particularly in terms of height (not exceeding 150 cm) and physical fitness level, to maintain the validity of comparisons between groups.

A purposive sampling technique was applied, which means that the selection of participants was based on specific predetermined criteria relevant to the objectives of the study. The main criteria included: (1) active participation in physical education classes, (2) no injury or medical condition affecting lower limb performance, and (3) willingness to participate throughout the entire training and testing period. The participants were then divided equally into two groups: Group A, which received moving-ball shooting drills, and Group B, which received stationary-ball shooting drills.

The data were collected through direct performance testing and measurement procedures designed to assess shooting accuracy. Each participant was instructed to perform three shooting attempts toward a designated goal target under both pretest and

posttest conditions. Scores were awarded based on the accuracy of the shots, with higher points assigned to strikes that reached the target zone. The total accuracy score for each participant was obtained by summing the three attempts. This scoring method was adapted from previous validated physical education performance measurement models (see Raharjo, 2018; Sulaiman, 2023).

All collected data were processed using Statistical Package for the Social Sciences (SPSS) version 26. The analysis began with descriptive statistics to summarize the mean, minimum, maximum, and standard deviation values for each group. Subsequently, the data underwent a normality test (Kolmogorov–Smirnov test) and a homogeneity test (Levene's test) to ensure that the assumptions of parametric testing were satisfied. To examine differences between pretest and posttest results within each group, a paired-sample t-test was employed. Furthermore, to evaluate comparative differences between the two groups, an independent-sample t-test was conducted. A significance level of $\alpha = 0.05$ was used for all statistical tests. The results of these analyses were used to determine the presence and magnitude of the effects of both shooting training methods on kick accuracy.

RESULT AND DISCUSSION

Result

The results of the study are presented based on the findings obtained from pretest and posttest measurements of shooting accuracy in both experimental groups: the moving-ball shooting group (Group A) and the stationary-ball shooting group (Group B).

Table 1. Descriptive Statistics of Shooting Accuracy Scores

Variable	N	Range	Minimum	Maximum	Mean	Std. Deviation
Pretest A	10	5	4	9	5.7	1.767
Posttest A	10	5	10	15	12	1.414
Pretest B	10	5	4	9	6.7	1.703
Posttest B	10	5	10	15	12.7	1.889

The data indicate an increase in mean scores from pretest to posttest in both groups. Group A's average score increased from 5.70 to 12.00, and Group B's mean increased from 6.70 to 12.70 after treatment.

Table 2. Kolmogorov–Smirnov Normality Test Results

Variable	Statistic	Df	Sig.
Pretest A	0.254	10	0.067
Posttest A	0.2	10	0.2
Pretest B	0.17	10	0.2
Posttest B	0.163	10	0.2

All significance values are greater than 0.05, indicating that the data for both groups are normally distributed.

Table 3. Levene's Test for Homogeneity of Variances

Data Type	Levene Statistic	Df1	Df2	Sig.
Pretest	0.038	1	18	0.847
Posttest	1.79	1	18	0.198

The significance values for both pretest (0.847) and posttest (0.198) are greater than 0.05, confirming that the variances between the two groups are homogeneous.

Table 4. Independent Sample t-Test Results

Test Type	Mean	Std. Deviation	*t*	Df	Sig. (2-tailed)
Pretest	5.7	1.767	1.289	18	0.214
Posttest	12	1.414	0.938	18	0.361

The results indicate no significant difference between the two groups' mean accuracy scores in both pretest and posttest measurements.

Table 5. Paired Sample t-Test Results

Variable	Mean Difference	Std. Deviation	*t*	Df	Sig. (2-tailed)
Group A (Moving Ball)	-6.3	0.948	21	9	0
Group B (Stationary Ball)	-6	1.633	11.619	9	0

The paired sample t-test results show significant improvements in shooting accuracy for both groups, as indicated by $p < 0.05$ in all cases.

Discussion

The present study investigated the differential effects of two shooting drill methods moving ball shooting and stationary ball shooting on the accuracy of kicks among eighth-grade students at SMP Negeri 18 Medan. The findings demonstrate that both interventions produced significant improvements in kick accuracy, with the stationary ball shooting group showing a marginally greater gain (post-test mean = 12.70) than the moving ball shooting group (post-test mean = 12.00). These outcomes allow for a multifaceted discussion regarding how these results align with, extend, or challenge existing research, as well as the practical and theoretical implications and limitations of the study.

Firstly, the significant improvements in both groups confirm that structured shooting drills can enhance students' kicking accuracy in a school context. This aligns with prior studies showing that targeted interventions improve shooting performance in youth football settings. For example, a study by Reza Zul Hanif, Nasuka Nasuka and Bambang Priyono (2022) found that training methods with fixed and changing targets significantly influenced shooting accuracy of adolescent players.

Secondly, the fact that the stationary-ball shooting group slightly outperformed the moving-ball shooting group warrants deeper reflection. It suggests that for this particular sample eighth-grade students with relatively homogeneous physical and skill characteristics the more controlled, predictable condition (stationary ball) may have allowed more focus on technique and accuracy rather than managing additional variables associated with a moving ball.

The finding that stationary drills may yield superior accuracy gains resonates with literature emphasizing the role of movement variability and task complexity in motor skill acquisition. According to Schmidt's Schema Theory (1975), learners develop a generalized motor program through variation and practice; yet in early phases, simplified conditions help refine the movement schema before complexity is increased. In this

sense, the stationary ball condition may serve as an intermediate stage in skill acquisition before introducing full game like complexity (e.g., moving ball, defenders, dynamic context).

Interestingly, a study by Atabaş & Yapıcı (2023) found that jump based training improved shooting accuracy more than speed based training among adult club players, suggesting that method matters for accuracy rather than just repetitions or volume.

In our case, the difference between moving vs. stationary ball may reflect a difference in cognitive motor demands and attentional load: the moving ball introduces a dynamic constraint that may initially detract from accuracy when participants are still consolidating shooting fundamentals.

Other studies support the notion that level of motor constraint influences accuracy outcomes: for instance, target media training (drills with specific target zones) improved accuracy in youth football players (e.g., Kurnianto et al., 2023). Our study thus contributes by comparing two drill-types (moving vs. stationary) in a controlled school context, indicating that for younger, less experienced players, a more stable training environment may enhance initial accuracy gains.

The novel contribution of this research lies in comparing moving ball and stationary ball shooting drills specifically in a junior secondary-school setting in Indonesia an underrepresented population in the literature. Many previous studies focus on elite academies or older youth players. Moreover, by demonstrating that both methods are effective but that the stationary approach may be slightly more favourable at this developmental stage, the study provides a practical guideline for physical-education teachers and coaches in school settings to structure their training programmes.

Another important aspect is the quantification of mean improvements and statistical confirmations, providing empirical evidence of effect size and significance, which adds to the body of evidence beyond simply stating that “improvement occurred”.

From a pedagogical perspective, the findings indicate that when implementing shooting accuracy drills among school-aged players, starting with stationary-ball conditions may facilitate better initial accuracy improvement before progressing to moving-ball drills. Coaches might therefore adopt a phased approach: begin with stationary shots to consolidate technique and accuracy, then transition to more dynamic drills (moving balls, defenders, game contexts). This can optimize training efficiency and minimize frustration or technical breakdown among inexperienced players.

Furthermore, the results reinforce the value of systematic pretest–posttest evaluation in school physical education contexts, enabling quantifiable monitoring of student progress and informing decisions about training design.

Theoretically, the study adds to the emerging body of literature on motor skill acquisition in soccer by demonstrating that drill type (static vs. dynamic) matters for accuracy outcomes among younger players. It extends existing research that focuses primarily on target media or strength/power interventions by including relational factors of ball movement. It also provides an empirical base for the claim that less complex, more predictable training tasks can benefit accuracy in early learning phases, thus aligning with motor learning theories.

Several limitations should be acknowledged. First, the sample size was small (n = 20), and limited to one school; thus, generalizability is constrained. Second, the duration of the intervention (12 sessions over one month) may not capture long-term retention or transfer to actual game situations. Third, the study did not track other performance factors such as shooting speed, decision making under pressure, or movement off the ball,

which may influence real-match accuracy. Fourth, the participants were homogeneous in gender (male) and grade (eighth), so findings may not apply to female players or different age groups.

Future research should examine how these training methods transfer into competitive match contexts, how mixed-drills (moving + stationary) perform over longer periods, and whether the effect holds in girls' soccer and different cultural contexts. Investigating interaction effects with physical fitness, leg power, and cognitive load (e.g., decision time) would also enrich understanding.

CONCLUSION

In conclusion, this study demonstrated that both moving-ball and stationary ball shooting drills significantly improved the shooting accuracy of eighth-grade students at SMP Negeri 18 Medan, with the stationary-ball method showing slightly greater effectiveness. These findings confirm that structured and repetitive shooting exercises can enhance motor coordination, focus, and technical precision in young players. The results also support motor learning theories suggesting that controlled practice conditions facilitate accuracy at the early stages of skill acquisition. Practically, the study provides valuable guidance for physical education teachers and soccer coaches to design progressive training programs beginning with stationary-ball drills before introducing dynamic, game-like conditions. Despite its limited sample size and short intervention period, this research contributes empirical evidence to youth soccer training literature and underscores the importance of targeted practice models in developing fundamental technical skills.

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CONFLICT OF INTEREST

Clearly explain whether there are any conflicts of interest related to the reported research.

REFERENCES

Atabaş, A., & Yapıcı, A. (2023). The effects of jump-based and speed-based training programs on shooting accuracy in soccer players. European Journal of Physical Education and Sport Science, 9(1), 45–56.

Fajar, M. (2020). Pengaruh latihan shooting dengan posisi bola diam dan bola berjalan terhadap akurasi tendangan ke gawang. Wahana Didaktika: Jurnal Ilmu Kependidikan, 18(1), 23–29.

Hanif, R. Z., Nasuka, N., & Priyono, B. (2022). The influence of fixed and changing target training on shooting accuracy in soccer. Journal of Physical Education and Sports, 11(3), 112–119.

Kurnianto, A., Fitriani, D., & Rahmadani, A. (2023). The effect of target-media training on shooting accuracy among youth football players. Jurnal Pendidikan Olahraga dan Kesehatan, 11(2), 87–95.

Nugraha, T., & Iskandar, D. (2023). Pengaruh latihan pliometrik terhadap peningkatan akurasi tendangan pada pemain sepak bola remaja. Champions Journal of Physical Education, 4(2), 56–63.

NurtaJudin. (2025). Model latihan spinning-shooting terhadap peningkatan akurasi tendangan pemain sepak bola usia muda. Jurnal Sport Science and Behavior, 5(1), 101–110.

Raharjo, S. (2018). Pengembangan alat target tendangan untuk melatih akurasi shooting permainan sepak bola. Jurnal Olahraga Prestasi, 14(2), 164–172.

Schmidt, R. A. (1975). A schema theory of discrete motor skill learning. Psychological Review, 82(4), 225–260. https://doi.org/10.1037/h0076770

Sulaiman, S. (2023). Pengaruh latihan shooting bola diam dan bola berjalan terhadap ketepatan shooting pemain usia 15 tahun sekolah sepakbola New Tugumuda Semarang. Indonesian Journal for Physical Education and Sport, 4(2), 436–442.