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EFFECT OF RUTHKOFF MODEL USING MASTERY LEARNING STYLE IN LEARNING SOME BASIC FOOTBALL SKILLS AMONG STUDENTS

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Abstract

Learning basic football skills requires effective teaching models that can foster engagement and improve performance outcomes. Traditional approaches often fail to maximize students' potential, particularly in skill-based subjects that demand both repetition and mastery. This study aimed to investigate the effect of the Rothkopf model using the mastery learning style on the acquisition of basic football skills among students. The research employed an experimental method with two equivalent groups (experimental and control). The sample consisted of 124 fourth-grade secondary students from Al-Suwaira Preparatory School for Boys during the academic year 2024–2025, representing classes A, B, and C. Data were collected through pre- and post-tests of passing, ball control, and dribbling, and analyzed using the SPSS software package. The findings revealed that students in the experimental group, who received instruction based on the Rothkopf model with mastery learning, showed significantly greater improvements in all measured skills compared to the control group. These results indicate that the Rothkopf model with mastery learning not only enhances skill acquisition but also increases motivation and engagement in the learning process. The study concludes that this model provides an effective instructional framework for teaching football skills and recommends its broader application in physical education curricula. The main contribution of this research lies in demonstrating how structured instructional design, rooted in mastery learning principles, can optimize the teaching of sports skills and support student-centered learning outcomes.

Keywords: rothkopf mode; mastery learning style; football skills

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INTRODUCTION

Teaching methods are one of the fundamental pillars in delivering curricula effectively (Kusmiyati et al., 2024; Rahmadi et al., 2023). Their role goes beyond transmitting knowledge; they contribute to the professional development of teachers, facilitate faster and more efficient learning, and help achieve the broader goals of educational institutions (Hardinata et al., 2023). To achieve these aims, there must be diversity in teaching methods, styles, and strategies that broaden learners' thinking horizons, enhance their ability to acquire knowledge, develop decision-making skills, and ultimately improve the teaching–learning process (Suryadi et al., 2023).

In the context of physical education, particularly in teaching sports skills, traditional teaching methods often remain dominant (Juni Samodra et al., 2024; Suryadi et al., 2024). These approaches, however, are limited in addressing individual differences among learners, tend to emphasize rote practice, and frequently result in students' lack of engagement and motivation (Harianto et al., 2023). Consequently, many students demonstrate weaknesses in mastering basic football skills (Ebrahim & Hussein, 2025; Ivanov, 2025). Field observations and consultations with specialists indicate that students often fail to meet the expected performance standards because they struggle to connect cognitive understanding with practical execution. The lack of mastery in the cognitive aspect reduces their ability to apply knowledge effectively during practice, thereby hindering skill acquisition (Harianto et al., 2023). This problem is compounded by the limited use of modern, learner-centered instructional models that stimulate active participation, critical thinking, and problem-solving.

To overcome these challenges, scholars have long sought innovative teaching strategies that both respect individual differences and ensure skill mastery. One such promising approach is the mastery learning style, which allows learners to progress at their own pace until they achieve a high level of competence before moving on to more complex tasks (Hakim et al., 2022; Nurhaliza & Sari, 2023; V. R et al., 2023). When combined with structured instructional models, mastery learning can significantly improve outcomes in the cognitive, affective, and psychomotor domains. In this regard, the Rothkopf model offers a systematic and scientifically grounded instructional framework that incorporates images, texts, and guided activities, positioning the learner as the central figure in the educational process (Kirby & Anwar, 2020).

The novelty of this study lies in integrating the Rothkopf model with the mastery learning style in the teaching of football skills. While previous studies have highlighted the benefits of mastery learning and structured models separately, limited research has examined their combined effect in the context of team sports such as football, particularly among secondary school students. By applying this integrated approach, the study not only addresses the persistent problem of students' weak acquisition of basic football skills but also introduces an innovative instructional strategy that could reshape how physical education is delivered (Hutajulu et al., 2025).

Accordingly, this study aims to investigate the effect of the Rothkopf model using the mastery learning style on learning some basic football skills among fourth-grade secondary

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students, with the expectation that it will provide both theoretical insights and practical contributions to the field of physical education. The objectives of this research are to determine the effect of the Rothkopf model using the mastery learning style on learning some basic football skills, and to identify the differences between pre-test and post-test results of the experimental group applying this model.

Based on these objectives, the study is guided by two hypotheses: first, that there are statistically significant differences between the pre-test and post-test results of both the experimental and control groups in learning basic football skills, and second, that there are statistically significant differences between the post-test results of the two groups. The scope of this research is defined in three domains: the human domain includes fourth-grade secondary students at Al-Suwaira Preparatory School for Boys in Wasit Governorate, Iraq; the time domain spans from November 25, 2024, to January 23, 2025; and the place domain is limited to Al-Suwaira Preparatory School for Boys in Wasit Governorate, Iraq.

METHOD

Research Methodology

This study employed the experimental method with a two-group equivalent design, consisting of an experimental group and a control group. The choice of this design was based on its suitability for addressing the research problem, achieving the stated objectives, and testing the proposed hypotheses. By using this approach, the researcher was able to examine the effectiveness of the Rothkopf model with the mastery learning style in comparison to traditional teaching methods in learning basic football skills.

Research Population and Sample

The research population consisted of fourth-grade secondary students at Al-Suwaira Preparatory School for Boys in Wasit Governorate during the academic year 2024–2025, totaling 124 students distributed across three classes (A, B, and C). From this population, the researcher selected a sample of 40 students randomly drawn from two of the three classes, with 20 students representing each class. Several students were excluded from the original population to ensure sample homogeneity and validity of results. Specifically, 7 students were retained due to failing the previous academic year, 6 students were absent, 2 students presented medical reports, 20 students had already participated in pilot and reliability tests, and 7 students were active volleyball players. After applying these criteria, the actual sample size was reduced to 40 students, representing 32.26% of the total population. These students were then equally divided into two groups of 20 students each, with the teaching methods randomly assigned to the groups to avoid bias and ensure the accuracy of the experimental procedures.

Table 1. To ensure that the research sample is homogeneous and equivalent, the following criteria were adopted

Variable	Unit of Measurement	Mean	Median	Standard Deviation	Skewness Coefficient
Age	Year	15.601	16	0.423	-1.129

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Weight	Kilogram (kg)	68.640	68.442	5.313	0.423
Height	Centimeter (cm)	167.611	166.640	5.151	-0.124

Table 2. Represents The Homogeneity Of The Research Sample

No.	Variable	Unit of Measurement	Control Group		Experimental Group		Calculated t-value	Confidence Level	Significance
			M	SD	M	SD			
1	Passing	Count	2.42	0.41	2.59	0.53	0.403	0.212	Random
2	Trapping	Score	1.66	0.89	1.86	1.11	0.704	0.143	Random
3	Dribbling	Seconds	13.42	1.68	13.06	3.66	0.775	0.211	Random

Experimental Group

The experimental group was taught using instructional units designed according to the Rothkopf Model integrated with the Mastery Learning Style. A total of twelve instructional units were implemented, each following the principle of small-group instruction to accommodate individual differences in performance levels. Based on pre-test results, the students were divided into three subgroups: low-performing, medium-performing, and high-performing. The low-performing subgroup received a greater number of repetitions, an emphasis on correct execution, and frequent, targeted feedback to ensure skill mastery. The medium-performing subgroup performed better than the first group and was provided with an appropriate number of repetitions. The high-performing subgroup demonstrated advanced skills compared to the other two groups and, therefore, was given extended instructional time to minimize performance gaps and individual differences.

During each instructional unit, the main section, lasting 30 minutes, was structured according to the four steps of the Rothkopf Model. The first step involved setting educational objectives by identifying learners' needs and prior knowledge, where the teacher motivated students and linked new material to their existing experiences. The second step focused on providing a suitable learning environment, where information was presented systematically with the aid of posters containing questions that stimulated purposeful thinking. The third step centered on enrichment and reinforcement, as students practiced the learned content using posters, diagrams, and images applied directly on the field, while being grouped according to their performance levels. The final step involved evaluation, which assessed the extent of learning achieved and reinforced accurate understanding.

Control Group

The control group followed the conventional teaching method employed by the course instructor for twelve instructional units. Students were randomly divided into small groups without consideration of pre-test results. The instructor maintained full control over the learning environment, making all decisions regarding instruction, application, and evaluation. Students were required to respond immediately to the directions provided, with minimal opportunity for discussion or exploration. This approach reflected a teacher-centered

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instructional model in contrast to the learner-centered design implemented in the experimental group.

Research Tests

To assess students' performance in basic football skills, several standardized research tests were employed. The first test measured passing accuracy by having students pass the ball toward a target drawn on a wall. The required tools included a size 5 football, an electronic stopwatch, and chalk for marking the target. The target measured 1 × 1 meter and was drawn on the wall at a distance of three meters from the examinee. Upon the referee's whistle, the student continuously passed the ball toward the target for 30 seconds. Each participant was allowed two consecutive attempts, with the best score recorded. A successful attempt was counted each time the ball entered the target area, and passes touching the boundary lines were also considered valid. This test provided a quantitative measure of accuracy and control in football passing.

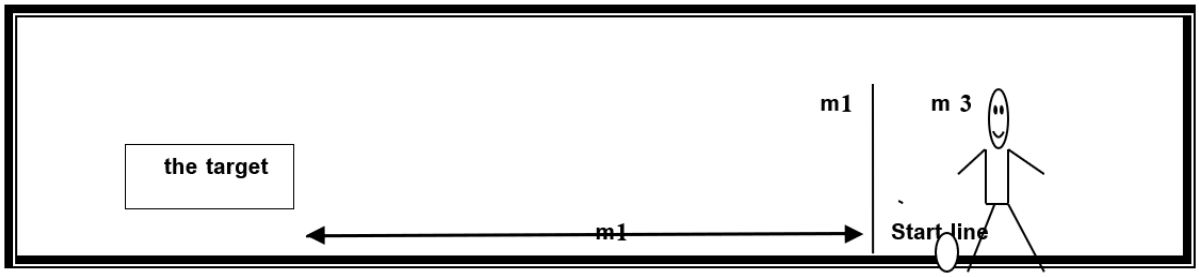

Figure 1. Illustrates the passing test in football.

Second Test: Dribbling Accuracy

The second test was designed to measure the accuracy of the dribbling skill by requiring students to roll the ball between five markers placed in a straight line. The tools required for this test included an official football, an electronic stopwatch, and five markers. The testing area was marked clearly to ensure standardization. During the test, the student positioned himself behind the starting line with the ball and, upon receiving the start signal, dribbled the ball with his foot between the five markers back and forth as illustrated in Figure (2). Each participant was allowed two consecutive attempts, with the best attempt recorded as the final score. The performance time was measured using an electronic stopwatch to the nearest one-tenth of a second, providing an accurate evaluation of the student's dribbling skill.

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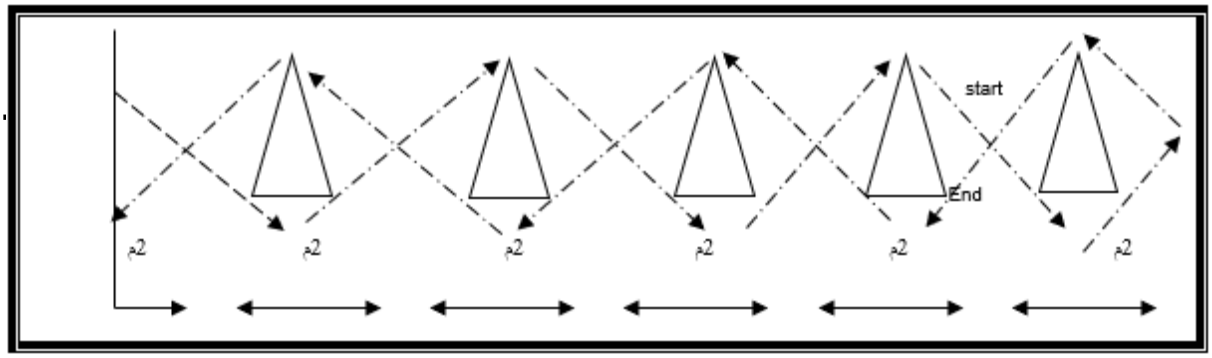

Figure 2. Illustrates The Accuracy Test Of The Dribbling Skill In Football

Third Test: Ball Control Accuracy

The third test aimed to measure the accuracy of controlling the ball by assessing the player's ability to stop and regain control using different body parts such as the inside of the foot, the instep, the thigh, or the chest. The tools required for this test included five official footballs, chalk for marking the testing area, and a whistle. The testing area was marked as a square measuring 2 × 2 meters, as illustrated in Figure (3). At the beginning of the test, the player stood behind line (A). Upon receiving the start signal, a high ball was thrown underhand by the assisting team, and the player advanced into the testing square, attempting to stop the ball within the designated area without using the arms. After each attempt, the player returned to the starting line and repeated the process five consecutive times.

The validity of the attempt required the ball to be controlled inside the designated area, with at least one foot remaining within the boundary lines. If the assisting team made an error in throwing the ball, the attempt was repeated without being counted. An attempt was considered unsuccessful if the player failed to stop the ball, crossed the boundaries of the testing area, or used an illegal method of control. Scoring was based on performance, with two points awarded for each successful attempt and zero points for unsuccessful ones. The maximum score achievable in this test was ten points, reflecting complete success across the five attempts.

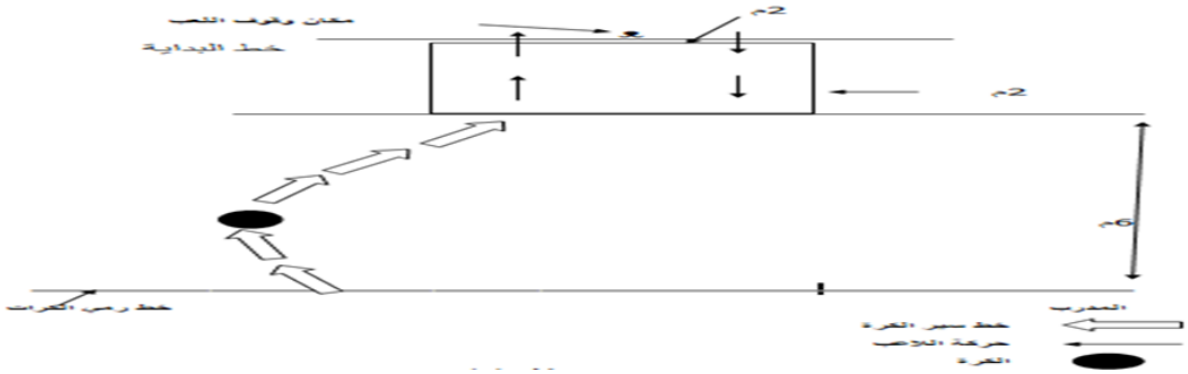

Figure 3. Illustrates the ball control (stopping) skill

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Data Analysis

The collected data were processed and analyzed using appropriate statistical methods to test the research hypotheses. Descriptive statistics, including the mean, standard deviation, and percentage, were calculated to summarize the results of the pre-test and post-test. To determine the significance of differences between the experimental and control groups, inferential statistics were applied, specifically the paired sample t-test for within-group comparisons (pre-test vs. post-test) and the independent sample t-test for between-group comparisons (experimental vs. control). The level of significance was set at ($\alpha \leq 0.05$) to decide whether the differences observed were statistically significant.

RESULTS AND DISCUSSION

Results

The test results in the experimental group showed a significant improvement in skills after applying the Ruthkoff model with the mastery learning style. The average passing ability increased from 2.59 to 7.01, ball control from 1.86 to 7.51, and dribbling time improved from 13.06 seconds to 10.16 seconds. High t-values (passing = 8.402; controlling = 8.661; dribbling = 7.855) with significance ($p < 0.05$) indicate significant differences in all skill variables. The results can be seen in Table 3.

Table 3. Pre-test and Post-test Results of the Experimental Group

Variables	Unit of Measurement	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD	Calculated t	Sig.	Significance Type
Passing	Count	2.59	0.53	7.01	0.89	8.402	0.000	Significant
Controlling	Score	1.86	1.11	7.51	1.01	8.661	0.000	Significant
dribbling	Seconds	13.06	3.66	10.16	1.58	7.855	0.001	Significant

The control group that did not use the Ruthkoff model also experienced an increase in skills, although not as much as the experimental group. Passing improved from 2.42 to 5.19, ball control from 1.66 to 5.18, and rolling time improved from 13.42 seconds to 11.28 seconds. The t-test also showed significant results for all three skills ($p < 0.05$). This indicates that the conventional method still had a positive effect, but the improvement was relatively lower than that of the experimental group. The results can be seen in Table 4.

Table 4. Pre-test and Post-test Results of the Control Group

Variables	Unit of Measurement	Pre-Test		Post-Test		Calculated t	Sig.	Significance Type
		Mean	SD	Mean	SD			
Passing	Count	2.42	0.41	5.19	0.72	4.043	0.023	Significant
Controlling	Score	1.66	0.89	5.18	1.62	4.201	0.021	Significant
Rolling	Seconds	13.42	1.68	11.28	1.48	5.001	0.019	Significant

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Table 5. Post-test Comparison of Experimental and Control Groups

Variables	Experimental Group		Control Group		Calculated t	Sig.	Significance Type
	Mean	SD	Mean	SD			
Passing	7.01	0.89	5.19	0.72	5.192	0.014	Significant
Controlling	7.51	1.01	5.18	1.62	5.345	0.013	Significant
Rolling	10.16	1.51	11.28	1.48	9.269	0.000	Significant

The results in Table 5 compare the post-test scores of the experimental and control groups. The results of the experimental group show greater superiority compared to the control group. The passing score in the experimental group had an average of 7.01, higher than the control group's 5.19. Ball control was also better in the experimental group (7.51) than in the control group (5.18). Meanwhile, rolling time was faster in the experimental group (10.16 seconds) than in the control group (11.28 seconds). All differences were significant ($p < 0.05$), so it can be concluded that the application of the Ruthkoff model with a mastery learning style is more effective in improving basic soccer skills than conventional methods.

Discussion

The findings presented in Tables (3 and 4) demonstrate that there were statistically significant differences between the pre-test and post-test results for both the experimental and control groups in learning basic football skills (passing, dribbling, and controlling), with improvements favoring the post-test. These results suggest that both the Rothkoff model with the mastery learning approach (applied to the experimental group) and the American method (applied to the control group) positively contributed to skill acquisition. Both instructional methods incorporated clear explanations, demonstrations, and structured guidance, which collectively enhanced the learning process.

Nevertheless, while improvements were recorded in both groups, the extent of skill acquisition varied. This difference can be attributed to the design of the instructional units, particularly the Rothkoff model with mastery learning, which systematically addressed individual differences by allowing learners to practice according to their performance level and receive targeted feedback. Such an approach reinforced motor learning principles, enabling students to acquire the necessary motor abilities to execute football skills more proficiently (Samodra et al., 2023). Table (5), which presents the post-test comparisons between the experimental and control groups, indicates that the experimental group significantly outperformed the control group across all measured football skills. The superiority of the experimental group can be attributed to the structured implementation of the Rothkoff model with mastery learning, as confirmed by the statistically significant (t) values. This model not only emphasized achieving mastery at each stage but also placed learners at the center of the learning process, thereby increasing engagement, autonomy, and active participation.

The Rothkoff model's four-step sequence was especially effective in fostering skill development. It encouraged students to connect prior knowledge with new learning experiences, engage in purposeful practice through structured tasks, and receive reinforcement

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in small, manageable stages (Ahimer et al., 2025). The use of visual aids such as educational posters further enriched the learning experience by linking theory to practice and making abstract skill concepts more concrete. Additionally, the model promoted excitement and reduced monotony in learning, creating a supportive environment that enhanced self-confidence and motivation. These findings are consistent with the views of Ebrahim & Hussein, (2025), who emphasized that placing the learner at the center of the educational process—while respecting their abilities and providing encouragement—facilitates deeper learning. Similarly, Abdullah & Abdullah, (2025) highlighted that modern teaching methods incorporating interactive tools enhance the effectiveness of instruction by fostering engagement, positive attitudes, and cumulative skill development.

The researcher also attributes the superior outcomes of the experimental group to the mastery learning approach, which requires learners to achieve a high level of proficiency in one unit before progressing to the next. This iterative process of practice, correction, and reinforcement not only develops stable motor skills but also strengthens cognitive and affective learning outcomes (Mariati et al., 2024; Yusroni, 2024). By ensuring mastery at each stage, students build a strong foundation for tackling more advanced and complex football skills in the future.

Despite the promising results, this study has certain limitations that should be acknowledged. First, the research sample was relatively small and drawn from a single school, which may limit the generalizability of the findings to broader populations. Second, the duration of the intervention was restricted to twelve instructional units, which may not have been sufficient to observe long-term effects or retention of the learned skills. Third, external variables such as students' physical fitness levels, prior exposure to football, and extracurricular practice were not fully controlled, which may have influenced the outcomes. Finally, the study relied primarily on performance-based tests without incorporating qualitative measures such as student perceptions, motivation, or attitudes toward the instructional methods.

These limitations highlight the need for further research with larger, more diverse samples, extended intervention periods, and mixed-methods approaches to capture both quantitative and qualitative dimensions of learning.

CONCLUSION

In light of the research findings and within the limitations of the study, it can be concluded that the experimental group, which was taught using the Rothkoff model combined with the mastery learning approach, achieved better results in learning basic football skills compared to the control group. The application of this model not only improved students' performance but also contributed to reducing wasted time and increasing the proportion of academic learning time that was effectively utilized. Moreover, the structured steps of the Rothkoff model with mastery learning lessened the burden on teachers by minimizing the effort required to correct errors and providing more efficient and targeted feedback, thereby enhancing the overall teaching and learning process. Based on these conclusions, several

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recommendations can be made. First, it is essential to encourage physical education teachers to adopt the Rothkoff model with mastery learning, as the present study demonstrated its positive impact on skill acquisition. Second, the model should be applied across different educational stages to give students the opportunity to develop their abilities collectively while addressing individual differences. Finally, educators are encouraged to utilize this model as a means to optimize both instructional time and teacher effort, thereby making the teaching process more effective and efficient.

AUTHOR'S STATEMENT

This manuscript is the author's original work and has not been published in any journal.

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