



EFFECT OF MODIFIED FIVE-STAGE LEARNING CYCLE STRATEGY USING RECIPROCAL METHOD ON LEARNING SOME BASIC HANDBALL SKILLS FOR STUDENTS

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ABSTRACT

Learning strategies play a vital role in enhancing students' acquisition of fundamental sports skills. Traditional teaching approaches often fail to maintain student motivation and engagement, particularly in skill-based subjects such as handball. Therefore, this study aimed to examine the effect of the Modified Five-Stage Learning Cycle Strategy integrated with the Reciprocal Method on learning selected basic handball skills among preparatory school students. The research employed an experimental design with two equivalent groups (experimental and control). The sample consisted of fourth preparatory grade students at Al-Suwaira Boys' Preparatory School during the academic year 2023–2024, with a total of 165 students across four sections. Statistical analysis was conducted using SPSS. The findings revealed that students in the experimental group who were taught using the Modified Five-Stage Learning Cycle Strategy with the Reciprocal Method showed significant improvement in passing and dribbling skills compared to their pre-test results and to the control group, as indicated by calculated *t* values exceeding the tabulated values at the 0.05 significance level. In conclusion, the study demonstrated that the application of the Modified Five-Stage Learning Cycle Strategy combined with the Reciprocal Method positively impacts students' acquisition of basic handball skills. This approach fosters engagement, reduces boredom, and provides structured learning opportunities that enhance skill development. The contribution of this research lies in offering practical evidence for integrating innovative instructional strategies into physical education curricula. It recommends that educators adopt this combined method to achieve better learning outcomes in handball and potentially extend its application to other skill-based sports education contexts.

Keyword: Modified Five-Stage Learning Cycle Strategy, Reciprocal Method, handball skills, physical education

Introduction

Our contemporary world witnesses significant scientific development in all fields of life. Facing and benefiting from this progress requires a solid and strong scientific foundation upon which creative, innovative individuals and researchers can rely across all levels and domains, including education (Ciptadi et al., 2025; Ebrahim & Hussein, 2025). Therefore, researchers and educators have turned their attention to searching for new strategies to help students learn how to use and benefit from them to improve their achievement and develop their thinking across various types of knowledge and sports skills. Modern strategies and methods are among the main pillars on which the educational process is based (Abdullah & Abdullah, 2025; Haniyyah et al., 2025; Zulfadila et al., 2025). Many ideas call for their use to elevate the educational process in line with the rapid global development today. They represent a fundamental cornerstone for achieving the best results and reaching desired goals, including the Modified Five-Stage Learning Cycle Strategy.

The Modified Five-Stage Learning Cycle Strategy considers students' mental abilities and encourages them to think critically while acquiring scientific knowledge. It consists of five teaching stages—Engagement or Preparation, Exploration, Explanation and Clarification, Expansion and Enrichment, and Evaluation—through which the teacher guides students both inside and outside the classroom. This strategy allows students to construct knowledge independently, develop essential concepts and skills, and foster reflective thinking at each step (Hussein, 2025). By engaging in experimentation, exploration, and peer comparison, learners are able to process information effectively, strengthen their role in the learning process, and achieve multiple levels of thinking.

To increase teaching effectiveness, attention should also be paid to methods that enhance self-learning, decision-making, and peer collaboration. The reciprocal method is one such approach, as it relies on paired student work where one acts as the performer and the other as the observer. This method promotes feedback exchange, individual consideration, and social interaction, while fostering responsibility and cooperation among students.

Handball, as a dynamic team sport that demands both speed and technical precision, requires modern teaching methods to effectively develop basic offensive and defensive skills (Haniyyah et al., 2025). Traditional instructional approaches often fail to maintain student engagement or provide sufficient opportunities for active learning, which can lead to slower progress and reduced skill mastery. This creates a pressing problem: how can educators design instructional strategies that not only improve technical skill acquisition in handball but also sustain motivation and active participation? In this context, integrating the Modified Five-Stage Learning Cycle Strategy with the reciprocal method offers a potentially effective solution. The significance of this study lies in its effort to address the gap between traditional teaching approaches and the demands of modern physical education, ensuring that students acquire both technical proficiency and critical learning skills.

The novelty of this research is reflected in the combination of two powerful instructional strategies—the Modified Five-Stage Learning Cycle and the Reciprocal Method—applied specifically to the teaching of basic handball skills. While previous studies have examined these strategies separately, little evidence exists regarding their combined effect in physical education, particularly in handball skill acquisition at the preparatory school level. This study, therefore, contributes new insights into how integrated teaching strategies can enhance learning outcomes and improve the quality of sports education. The research question guiding this study is: Does the Modified Five-Stage Learning Cycle Strategy combined with the Reciprocal Method significantly improve the

learning of basic handball skills among preparatory school students?

Method

Research Design

This study employed the experimental method using 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 study objectives, and testing the proposed hypotheses.

Participant

The research population included all fourth preparatory grade students at *Al-Suwaira Boys' Preparatory School* in Wasit Governorate during the academic year 2023–2024, with a total of 165 students distributed across four sections (A, B, C, and D). From this population, a sample of 64 students was selected to represent two sections. The sample was divided equally into two groups, with 32 students assigned to the experimental group and 32 students assigned to the control group. The selection was carried out randomly after excluding 18 students due to absence or irregular attendance, making the final sample represent 38.78% of the total population. Instructional strategies were also randomly assigned, where the experimental group was taught using the Modified Five-Stage Learning Cycle Strategy integrated with the Reciprocal Method, while the control group received instruction through the traditional teaching method commonly used in physical education. This design ensured group equivalence and provided a sound basis for comparing the outcomes of the two instructional approaches.

Table 1. Shows the number of sample members according to the research groups (experimental and control).

Section	Research Group	Method Used	Total Number	Excluded Students					Remaining Sample Size
				Failures	Absentees	Medical Reports	Exploratory Tests & Stability	Practicing the Game	
A	Experimental	Modified Five-Stage Learning Cycle Strategy with Reciprocal Method	41	1	2	0	5	1	32
B	Control	Command Method	41	2	1	1	5	0	32
	Total		82	3	3	1	10	1	64

Table 2. Represents the homogeneity of the research sample.

Variables	Unit of Measurement	Mean	Median	Standard Deviation	Skewness Coefficient
Age	Years	15.016	16	0.411	-1.118
Weight	Kg	69.406	69.424	5.123	0.412
Height	cm	168.161	168.406	5.012	-0.112

Table 3. Shows the means and standard deviations in the equivalence tests between the control and experimental groups, along with the calculated and tabulated (T) values and their statistical significance.

Tests	Measurement	Control Group		Experimental Group		Calculated value	t-	Statistical Significance
		Mean	± SD	Mean	± SD			
Passing	Number of times	19.83	1.03	20.33	1.46	1.21		Not significant
Dribbling	Seconds	14.55	2.13	14.38	0.47	0.28		Not significant

The tabulated t-value was (2) at a significance level of (0.05) with (62) degrees of freedom.

Field Research Procedures

Following a comprehensive review of scientific literature on handball and an examination of the handball curriculum for fourth-grade preparatory students, in addition to conducting interviews with the physical education teacher regarding the instructional method he typically employed, an instructional program was developed focusing on two fundamental handball skills: passing and dribbling. The program was designed based on the Modified Five-Stage Learning Cycle Strategy combined with the Reciprocal Method. It consisted of eight instructional units for each teaching approach, with four units dedicated to each skill. Each instructional unit lasted 45 minutes. Prior to the implementation of the program, the assisting team participated in a workshop to ensure they were fully prepared for their roles. Moreover, two introductory sessions were delivered to the research sample to familiarize the students with the selected skills and testing procedures before the administration of the pre-tests. These sessions were not part of the proposed instructional program but were intended to minimize potential errors during the main experimental phase.

The experimental group received instruction through the proposed eight-unit program using the Modified Five-Stage Learning Cycle Strategy integrated with the Reciprocal Method. During each session, students were paired as performer and observer, with the performer executing the skill and the observer providing immediate feedback. The teacher supervised the pairs and communicated primarily with the observers, intervening only when serious execution errors occurred. Each instructional unit followed the five stages of the Modified Five-Stage Learning Cycle Strategy: (1) the Engagement stage, designed to capture attention through posters, diagrams, ideal performance images, and guiding questions; (2) the Exploration stage, where skills were explained and demonstrated by both the teacher and a student model, followed by guided discussion; (3) the Explanation (Clarification) stage, conducted in the practical part of the lesson through peer feedback in performer–observer pairs; (4) the Expansion stage, which gradually increased the complexity of the skill and encouraged creativity through both teacher and peer assessments; and (5) the Evaluation stage, where students reflected on their performance, identified errors, and improved execution with constructive teacher feedback.

The control group, on the other hand, was taught through the traditional instructional method used by the subject teacher. Instruction was delivered over eight sessions, with students divided randomly into small groups regardless of their pre-test results. The teacher maintained full control of the instructional process, made all instructional and evaluative decisions, and expected immediate student compliance with directions, with little room for discussion or peer interaction.

Research Tests were employed to measure students' performance before and after the intervention. The first test, the Wall Passing Coordination and Speed Test (Risan Khuraibet, 1989), aimed to assess students' coordination and wall passing speed. In this test, each student stood three meters away from a flat wall and, upon the start signal, passed the ball against the wall as many times as possible within 30 seconds. The number of successful passes—defined as completed passes where the ball was received and controlled—was recorded as the score. The test required one handball, two digital stopwatches, and a flat

wall as equipment.

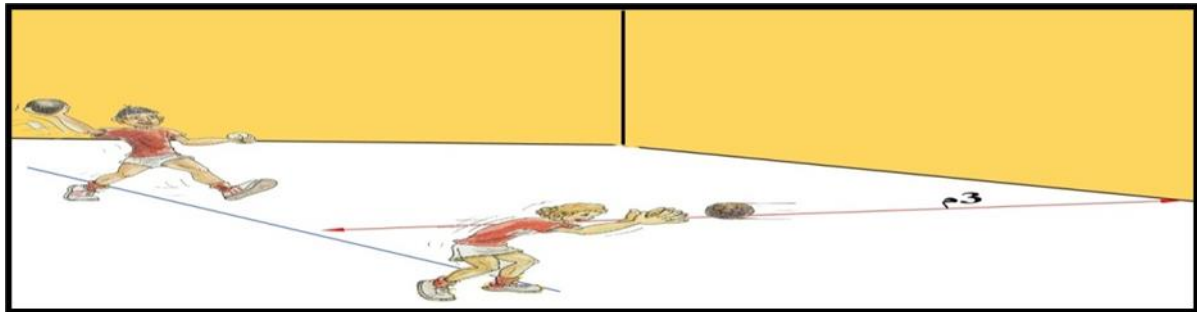


Figure 1. Illustrates the handball passing skill.

The second test was the Dribbling Skill Test (Mounir Girgis Ibrahim, 2004), which aimed to measure the students' level of proficiency in dribbling while maintaining control of the ball under dynamic conditions. The test required five vertical markers (flags), two digital stopwatches, and one handball. The markers were arranged in a straight line, with the first placed three meters from the starting line and each subsequent marker positioned three meters apart. At the start signal, the student began dribbling the ball while running in a zigzag pattern around the markers, continuing back and forth until crossing the finish line. The time taken to complete the entire course, measured from the initial movement at the start line until the student crossed the finish line, was recorded as the performance score.

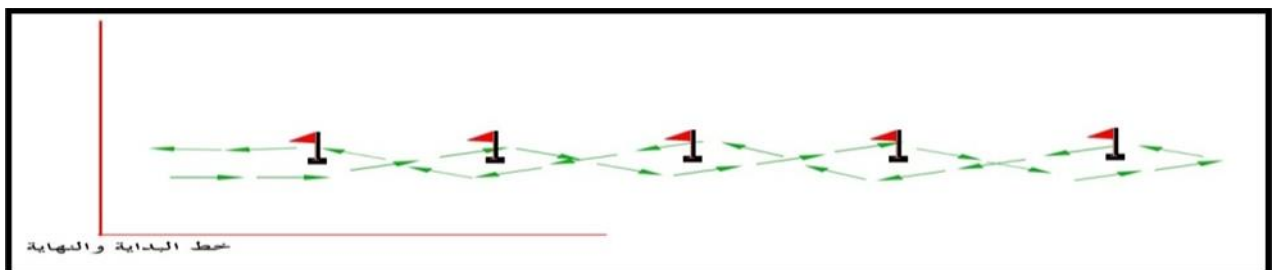


Figure 2. Illustrates the handball dribbling skill.

Results

Based on the application of the statistical methods, several findings were obtained regarding the research variables. The first stage of the analysis focused on examining the performance of the control group in the pre-test and post-test of the selected basic handball skills. To determine whether significant differences existed between the two measurements, a paired-samples *t*-test was employed. The results are presented in Table (4).

The analysis of the control group's performance showed that there were improvements in both passing and dribbling skills between the pre-test and post-test. However, the differences, while statistically significant, were relatively modest when compared to the experimental group. This indicates that the traditional instructional method contributed to some development in students' skill levels but did not achieve the same level of effectiveness as the Modified Five-Stage Learning Cycle Strategy with the Reciprocal Method.

These findings suggest that while conventional approaches to teaching handball can enhance performance to a certain degree, they may not fully engage learners or provide the structured opportunities for feedback and peer interaction that are crucial for maximizing skill acquisition. The results thus highlight the importance of innovative instructional

methods in physical education to ensure both skill mastery and sustained student engagement.

Table 4. Illustrates the means, standard deviations, and calculated *t* values for the pre- and post-tests of the control group in the basic skills tests.

Variables	Unit of Measurement	Pre-Test		Post-Test		T Calculated	T Tabulated	Significance of Differences
		Mean	SD	Mean	SD			
Passing	Number of times	19.83	1.03	21.76	1.65	2.9	2.04	Significant
Dribbling	Seconds	14.55	2.13	13.43	1.76	3.3		Significant

At a significance level of (0.05) and with (31) degrees of freedom.

Table 5. Shows the means, standard deviations, and calculated *t* values for the pre-test and post-test of the experimental group in the basic skills tests.

Variables	Unit of Measurement	Pre-Test		Post-Test		T Calculated	T Tabulated	Significance of Differences
		Mean	SD	Mean	SD			
Passing	Number of times	20.33	1.46	24.22	2.22	5.4	2.04	Significant
Dribbling	Seconds	14.38	0.47	11.13	2.08	3.9		Significant

At a significance level of (0.05) and with (31) degrees of freedom.

Table 6. Shows the means, standard deviations of the post-test results for the selected skills in both the control and experimental groups, along with the calculated and tabulated *t* values and their statistical significance.

Variables	Unit of Measurement	Pre-Test		Post-Test		T Calculated	Significance of Differences
		Mean	SD	Mean	SD		
Passing	Number of times	21.76	1.65	24.22	2.22	4.8	Significant
Dribbling	Seconds	13.43	1.76	11.13	2.08	4.6	Significant

The tabulated *t*-value reached (2) at a significance level of (0.05) and a degree of freedom (62).

To examine the effect of the instructional methods on the development of selected basic handball skills, paired and independent sample *t*-tests were employed. Analysis of the control group (Table 4) showed a statistically significant improvement between the pre-test and post-test scores in both passing and dribbling skills. The mean passing score increased from 19.83 to 21.76, with a calculated *t* value of 2.9, exceeding the tabulated value of 2.04 at the 0.05 significance level. Similarly, the mean dribbling time improved from 14.55 seconds to 13.43 seconds, with a calculated *t* value of 3.3, also indicating significant progress. These results suggest that the traditional teaching method contributed to some improvement in students' performance.

In the experimental group (Table 5), the results indicated a higher degree of progress. The mean score for passing increased from 20.33 to 24.22, with a calculated *t* value of 5.4, while the mean dribbling time decreased from 14.38 seconds to 11.13 seconds, with a calculated *t* value of 3.9. Both improvements were statistically significant at the 0.05 level, demonstrating that the Modified Five-Stage Learning Cycle Strategy combined with the Reciprocal Method had a stronger positive impact on skill acquisition compared to traditional instruction.

Finally, the comparison between the control and experimental groups in the post-test (Table 6) revealed significant differences in favor of the experimental group. For passing,

the experimental group achieved a mean score of 24.22 compared to 21.76 in the control group, with a calculated t value of 4.8. For dribbling, the experimental group recorded a mean time of 11.13 seconds compared to 13.43 seconds for the control group, with a calculated t value of 4.6. Both differences were statistically significant at the 0.05 level, confirming the superiority of the instructional approach applied in the experimental group.

Overall, these findings demonstrate that while traditional methods can lead to improvements in basic handball skills, the integration of the Modified Five-Stage Learning Cycle Strategy with the Reciprocal Method provides a more effective and engaging framework for enhancing students' learning outcomes. The combination of structured stages with peer feedback mechanisms appears to accelerate skill mastery, deepen understanding, and sustain motivation throughout the learning process.

Discussion

The findings presented in Tables (4) and (5) indicate statistically significant differences between the pre-test and post-test results for both passing and dribbling skills, favoring the post-test. This improvement can be attributed to the educational curriculum that integrated the Modified Five-Phase Learning Cycle strategy with reciprocal teaching and the American method. The structure of the curriculum—comprising explanation, demonstration, and targeted guidance—proved effective in enhancing learning outcomes. These methods enabled learners to acquire essential skill-related abilities, which aligns with the notion that every teaching method, when systematically applied, contributes to achieving specific pedagogical goals (Motion, Sarah A., 1991). Although both groups showed progress, the rate of development varied, demonstrating the differential impact of the applied strategies.

Table (6) highlights significant differences in post-test results between the control and experimental groups, favoring the experimental group. Since all calculated t-values exceeded the tabulated t-value, it can be concluded that the Modified Five-Phase Learning Cycle strategy combined with the reciprocal method had a more substantial effect on skill development. The diverse instructional techniques, including lectures, group discussions, and visual aids such as pictures and charts, created a supportive learning environment that sustained students' attention and engagement. Furthermore, the reciprocal method allowed learners to play an active role in the educational process. Peer feedback, coupled with teacher monitoring, enhanced motivation and performance, confirming the critical role of feedback in guiding learners before, during, and after execution (Schmidt, A., 1982).

The effectiveness of this approach can also be explained through the structured phases of the Modified Five-Phase Learning Cycle. During the engagement phase, teaching aids stimulated motivation and accelerated cognitive responses (Ebtehaj Ahmed Abdel Aal, 1999). In the exploration phase, modeling by the teacher, supported by clear visuals, reinforced understanding (Fulkert, 2000; Dhafer Hashem Ismail, 2002). The explanation phase emphasized systematic practice through preparatory, main, and final stages, allowing for skill consolidation and stability (Haidar Al-Yaqubi, 2013). The expansion phase encouraged learners to integrate new knowledge with prior experiences, promoting mastery and adaptability. Finally, the evaluation phase provided both learners and teachers with essential feedback regarding progress and future needs, reinforcing evaluation as a critical component of the learning process.

Additionally, by shifting responsibility from the teacher to the student, the strategy fostered greater autonomy, enthusiasm, and active participation in learning. This multifaceted approach, which exposed students to varied modes of explanation, aligns with findings that individualized learning styles benefit from diverse instructional strategies,



ultimately leading to improved achievement (Zaid, Dalia Zakaria Abbas, 2014).

Conclusion

Based on the findings and within the limitations of this study, it can be concluded that the experimental group, which applied the Modified Five-Phase Learning Cycle strategy combined with the reciprocal method, achieved better outcomes in learning basic handball skills compared to the control group. The use of this strategy also proved effective in reducing wasted time and increasing the efficiency of academic learning time. Furthermore, it lessened the effort required from the teacher in correcting errors by allowing for peer monitoring and feedback, thereby ensuring more precise and appropriate instructional support. In line with these conclusions, the researcher recommends encouraging physical education teachers to adopt the Modified Five-Phase Learning Cycle strategy with the reciprocal method due to its positive impact on students' learning outcomes. This strategy should also be applied at various educational levels in physical education classes to provide students with opportunities to express their abilities collectively while still considering individual differences. Additionally, educators and practitioners are advised to benefit from this strategy to optimize both time and effort in the teaching and learning process.

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