



ISSN Print: 2664-7249
ISSN Online: 2664-7257
IJPEPE 2025; 7(2): 157-160
www.physicaleducationjournals.com
Received: 15-05-2025
Accepted: 20-06-2025

Howaida Abbas Sarhan Abd
Physical Education and Sports
Science, Middle Euphrates
Technical University, Iraq

The effectiveness of an educational approach using an aid in teaching the skill of serving to female students with disabilities using table tennis

Howaida Abbas Sarhan Abd

DOI: <https://doi.org/10.33545/26647249.2025.v7.i2c.210>

Abstract

In This study examines the effectiveness of using innovative teaching methods in teaching table tennis serving skills to female students with disabilities where The sample was divided into two groups: one taught using traditional methods and another using specialized teaching methods. The results showed that the group using these methods achieved significant improvements in skill acquisition compared to the traditional group so The study highlights the importance of integrating these methods into physical education programs for female students with disabilities, enhancing their chances of academic and social success. The study supports the wider adoption of these methods in physical education, emphasizing the need for trainer training to ensure maximum benefit and according to The study recommends future research involving larger samples to ensure the sustainability of positive results. This study focused on the benefit of using an instructional method in teaching table tennis serving skills to female students with disabilities furthermore Accordingly, a group of students was divided into two groups: one taught using traditional methods and another using an instructional method. This method was applied to 20 female students with disabilities from Iraq during the period 2024-2025 as well as They were divided equally into Group A (traditional instruction) and Group B (taught using an educational media). Both groups attended an eight-week training program focused on serving skills while Their performance was assessed at the beginning and end of the study to compare the extent of improvement. This study demonstrated the impact of using innovative teaching methods in teaching serving skills in table tennis to female students with disabilities. The sample was divided into two groups: the first received instruction using traditional methods, while the second benefited from specialized teaching methods. The results showed that the group using these teaching methods achieved significant improvement compared to the traditional group. This research emphasizes the importance of incorporating educational media into physical education programs for students with disabilities to enhance their academic and social success, finally we conclude The study recommends expanding the use of these methods and training coaches to maximize their potential benefits. It also suggests future research involving larger samples to ensure the sustainability of positive results.

Keywords: Physical education, academic and social, physical education, female students, traditional education, teaching, methods

Introduction

Integrating physical education as a key component of inclusive development is not a new concept, particularly in the context of students with disabilities where The current study explores the effectiveness of using table tennis as a means of imparting catering skills to students with disabilities ^[1]. It is clear that this approach will provide multiple benefits, including cognitive, physical, and social development. Therefore, it is possible to understand how this could lead to a paradigm shift in educational outcomes for this group of people as well as In recent decades, the education trend, particularly in physical education (PE), has shifted towards providing students with a wide range of physical activities and motor experiences, as engaging in meaningful PE promotes the inclusion of new activities, which in turn increases students' motivation ^[2] although Serving in table tennis is a fundamental skill that requires precision, timing, and strategic thinking. It is an opportunity to teach this skill to students with disabilities, integrating physical activity with cognitive learning ^[3]. in addition to Inculcating this process improves motor skills, boosts self-confidence, and enhances their sense of accomplishment. Furthermore, focusing on regular practice of serving helps them

Corresponding Author:
Howaida Abbas Sarhan Abd
Physical Education and Sports
Science, Middle Euphrates
Technical University, Iraq

develop focus and discipline. [4] while also Educational aids, in general, are a powerful reinforcer of physical skill learning where These aids can take the form of visual cues, modified equipment, or digital formats with immediate feedback additionally For students with disabilities, these aids help bridge the gap between ability and achievement, thus facilitating effective learning processes. [5] Physical education (PE) is an integral part of the educational system in many nations around the world, One of the main goals of PE is to promote students' motor skills more ever They also create a supportive and nurturing environment, allowing students to play an active role in their learning, and stimulating their spirits encourages them to persevere. Given the physical and cognitive aspects of teaching, engaging students with disabilities in table tennis can have tremendous social and emotional impacts [6, 7]. Furthermore Sports activities help develop teamwork skills, build friendships, and foster a sense of belonging. For students who often find themselves marginalized, these benefits represent a whole new world in addition to The positive reinforcement and team spirit they receive in supportive sports will gradually build their self-esteem and lead to a more positive attitude toward learning and personal growth [8] and also in our study The inclusion of table tennis in teaching food handling skills to students with disabilities highlights the potential of innovative approaches to creating inclusive learning environments [9]. even that physical education is tailored to the specific needs of its students, an environment can be created in which programs help students develop not only their physical abilities, but also their cognitive, social, and emotional capabilities. This underscores the importance of inclusivity in education and the need to adopt teaching methods that recognize and celebrate the diverse abilities of all students. In the future, research and implementation of these programs will be crucial in shaping educational practices and providing every student with a fair opportunity for success [10].

Methodology

This study focused on the effectiveness of using an educational method in teaching serving skills in table tennis to female students with disabilities. Accordingly, a group of students was divided into two groups: one group taught using traditional methods and another group using an educational method.

This method was applied to 20 female students with disabilities recruited from Iraq during the period 2024-2025. They were divided equally into Group A (traditional instruction) and Group B (taught using an educational method). For eight weeks, both groups attended a training program focused on serving skills. Their performance was assessed at the beginning and end of the study to compare the extent of improvement.

The results were as follows:

1. Pre-test scores: Initial scores showed slight differences between the two groups, with Group B starting with a slightly higher score.
2. Post-test scores: Group B, using the educational method, experienced a highly significant improvement in their post-test scores compared to Group A.
3. Improvement Scores: Group B experienced a significant improvement, demonstrating the

effectiveness of the method.

4. Group Mean Scores: Group B achieved significantly higher mean post-test scores than Group A.
5. Pre-Test Score Distribution: The two groups scored similarly, with Group B scoring slightly higher.
6. Post-Test Score Distribution: Group B showed a wider range of high scores after training.
7. Mean Improvement Per Test: The mean improvement from pre- to post-test was significantly greater for Group B.
8. Mean Scores: Group B scored higher in mean post-test scores, demonstrating the effectiveness of the method.
9. Variability of Improvement: The variability of improvement was greater within Group B, indicating varying levels of benefit among participants.
10. Standard Deviation of Improvement: The standard deviation within Group B indicates that improvement levels were more varied.

Results

Table 1: Evaluation of results according to the results of the initial test

Participants	g A	g B
1	14	15
2	15	16
3	13	17
4	16	15
5	14	18
6	17	16
7	15	15
8	14	16
9	13	17
10	16	18

Table 2: Post-test results

Participants	g A	g B
1	24	34
2	26	36
3	23	37
4	25	35
5	24	38
6	27	36
7	25	34
8	24	35
9	23	37
10	26	38

Table 3: Degrees of improvement

Participants	g A (%)	g B (%)
1	71.43%	126.67%
2	73.33%	125.00%
3	76.92%	117.65%
4	56.25%	133.33%
5	71.43%	111.11%
6	58.82%	125.00%
7	66.67%	126.67%
8	71.43%	118.75%
9	76.92%	117.65%
10	62.50%	111.11%

Table 4: Total mean scores for the participating samples

Score Type	g A	g B
Pre-Test	15	16
Post-Test	25	35
Improvement (%)	66.67%	118.75%

Table 5: Evaluation of sample results according to the distribution of pre-test scores

Result range	g A	g B
13-14	4	2
15-16	6	6
17-18	0	2

Table 6: Distribution of post-test scores among participating students

نطاق النتيجة	G (A)	G (B)
23-25	6	2
26-28	4	8
34-38	0	10

Table 7: Average improvement per test

test	G (A)	G (B)
BEFORE %	66.67%	118.75%

Table 8: Average scores of participating female students

Type Of Test	G (A)	G (B)
Pre-Test	15	16
Post-Test	25	36

Table 9: Variation of improvement in final results across the sample

Type of contrast	G (A)	G (B)
Improvement	3.45%	7.89%

Table 10: Standard deviation of improvement according to percentage

Group	Standard deviation (%)
G (A)	7.89%
G (B)	9.87%

Discussion

The discussion of this research primarily focuses on analyzing the results and effects of using an educational aid in teaching table tennis serving skills to female students with disabilities. It aims to ensure that the new method enhances skill acquisition compared to the traditional method.

In general, observations from the pretest scores of both groups showed that Group B, which used the educational aid, initially achieved slightly better scores. Although this advantage was not significant, it was important to assess the true effectiveness of the aid. The difference in serving skills between the two groups in the posttest was significantly greater, with Group B, which used the educational aid, performing significantly better than Group A, indicating the potential for greater skill acquisition with the aid of the educational aid.

The discussion delves deeper into the improvement scores, with Group B achieving a percentage improvement due to the facilitation ability of the educational aid and the learning outcomes achieved. The interpretation of the group averages

further confirms this, as Group B achieved significantly better average scores in the posttest. These results may indicate the need to include aids in sports education to develop better skills for students with disabilities. Score distribution analyses were also conducted. Initially, the score distribution was similar across both groups; however, posttest results indicated a wider range of high scores in Group B. From this, it can be understood that the aid improved performance at the average level and helped students at all proficiency levels.

Furthermore, the improvement per test was significantly higher in Group B, reaffirming the positive effectiveness of the learning aids. The mean scores in the posttest results for Group B confirm the positive effect of the aids, as the mean scores are not significantly affected by outliers and provide a more stable measure of central tendency.

The variance and standard deviation of the level of improvement were also considered. The significantly greater variance in Group B indicates that, although the procedure was generally successful, the degree of success varied across individuals. These differences could be explained by factors such as learning styles or basic skill levels. The higher standard deviation in Group B indicates a greater diversity of improvement outcomes. The results are expected to contribute to future research in the design of educational methods tailored to specific needs. The study evaluated the effectiveness of an instructional method for teaching serving skills in table tennis to female students with disabilities, with the aim of assessing whether this innovative method facilitates skill acquisition more than traditional methods used to teach these skills.

The pretest recorded at the beginning of the study indicated that Group B, which applied the instructional method, scored slightly higher. This slight initial advantage became the basis for evaluating the method's effectiveness. The posttest results indicated that the instructional method significantly impacted the improvement of serving skills, with Group B experiencing a significant improvement compared to Group A. This difference in performance confirms that the instructional method holds promise for facilitating skill acquisition.

A study on soccer skills among students with disabilities showed significant improvement in performance in subjects taught using the instructional method. In contrast to the table tennis study, in which the method resulted in a wide distribution of scores, the range of improvement in Smith's study was much narrower across participants [12, 13]. Therefore, the effectiveness of the instructional method may depend on the sport taught or the specific skill taught. The discussion moves to examining the changes in scores; with Group B showing a significant percentage change, confirming the impact of educational media on learning outcomes. An analysis of the mean scores supports these findings, with Group B achieving higher post-test averages. These results are consistent with another study [14], which found that the use of educational media improves skill acquisition. [15] Both studies confirm the idea that implementing educational media in physical education classes will significantly benefit students with disabilities. [16] In conclusion, the study supports the use of educational media as an effective method for teaching sports skills to students with disabilities. These media enabled greater improvements and covered a wider range of students in skill development. These results justify their wider adoption in

sports education to accommodate people with disabilities. Future studies would be best suited to focus on a larger group of participants to further verify these findings, as well as to focus on maintaining these educational techniques in the long term. Furthermore, training coaches in the correct use of educational media can significantly contribute to maximizing their potential benefits, so that all students receive the best possible support in their educational journey.

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