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The IMPACT of the Reciprocal Teaching Style on Developing Volleyball Skills Among 10 th-Grade Students with Hearing Impairments in Palestine

[1]Mohammed Omar Nabhan, [2]Rachid Sakly

[1]Graduate Student, Higher Institute of Physical Education and Sports, Manouba University, Tunisia. abuezz1985@gmail.com
[2]Professor, Higher Institute of Physical Education and Sports, Manouba University, Tunisia. rchidesstsm@gmail.com

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Abstract
Objectives: The study aims to identify the impact of the reciprocal teaching style on developing volleyball skills among 10th-grade students with hearing impairments in Palestine.
Methodology: The researchers used the experimental method with a design of two equal groups, one experimental and one control. The sample consisted of 24 students from Mustafa Sadiq Al-Rafii Secondary School for the Deaf.
Results: There were statistically significant differences ($\alpha \leq 0.05$) between the average scores of the two groups in the cognitive test and the observation sheet, favoring the experimental group. The value of Eta squared (η^2), which exceeded 0.14, indicated a high effect size.
Conclusion: The reciprocal teaching style significantly contributed to the development of volleyball skills and is suitable for teaching students with hearing impairments. Students with hearing impairments can respond to their teacher when teaching methods are adjusted.
Keywords: Reciprocal teaching style, volleyball skills, hearing impairment.

Introduction

The physical education teacher seeks to explore more effective learning methods and develop his teaching skills. He recognizes that the learning process is not merely a repetitive activity; rather, it is a continuous process that involves acquiring new skills and understanding, which can enhance his sensitivity to the challenges posed by students. The diversity of teaching methods facilitates physical education teachers in conveying information to students while considering individual differences. Each method has its own unique features that distinguish it from others. The reciprocal method is considered the third method in the sequence of teaching methods regarding decision-making in the educational process. In the implementation phase, the teacher assigns significant roles to the students by dividing tasks among them, where one student performs the task while the other observes. The performing student executes the skill under the supervision and observation of his peer, who takes on the role of the teacher (Author Al- Zuhairi, 2011). The researchers believe that the reciprocal method is very suitable for teaching volleyball skills because volleyball holds a prestigious position in competitive sports activities across various fields. In addition to its role in recreation and utilizing free time, it is a sport that can be practiced without the need for direct contact between teams. It is widely accepted among different age groups and nationalities, and it is characterized by its ease of practice (Mohammed, 2018). Since volleyball is a team sport that requires teamwork during practice, the researchers found the reciprocal method suitable for students with hearing impairments. Hearing impairment is a condition faced by an individual due to genetic, congenital, or environmental factors that lead to a deficiency in hearing, affecting their ability to learn and perform certain sports and social activities that healthy individuals typically engage in in their daily lives (Al-Lala et al., 2011).After the

researchers reviewed numerous educational studies and research that linked the reciprocal method to other variables, the researchers confirmed its importance in the teaching process. For instance, Ali (2020) emphasized the effectiveness of reciprocal learning in teaching slow and static motor skills in gymnastics. Bernimpong and others (2021) highlighted the impact of the reciprocal teaching method on the ability to hit a shuttlecock among students. Furthermore, Faleh's study (2020) recommended that the reciprocal method had a greater impact on the research sample compared to the American method and the inclusion method in learning skills such as dribbling, passing, receiving, and shooting from a standstill. Additionally, Adham (2016) found that the reciprocal method significantly influenced the learning and development of high dribbling skills in basketball and that it effectively increased the retention of high dribbling skills among female students compared to the control group, which used the traditional method. This was consistent with the findings of Salman and Saeed (2010), who reported the impact of the reciprocal method in learning the serving and receiving skills in volleyball, favoring the second experimental group among the three experimental groups that employed the reciprocal method in teaching volleyball skills. As well as the presence of studies linking hearing impairment to other variables, such as: Weiss (2021), Martinez (2020), Shehata and Al-Qahtani (2020), Al-Hadithat (2018), Salman and Ali (2017), and Al-Mufti (2013).

Research Problem

Due to the scarcity of studies in the field of physical education for students with hearing impairments and the lack of specialized physical education curricula for them which are often derived from general curricula without consideration for their specific needs. The idea of this study emerged to develop a curriculum based on movement games, including volleyball, with the aim of enhancing the fundamental motor skills of children with hearing impairments. For this purpose, the researchers visited schools dedicated to students with hearing impairments and gathered their feedback to prepare an appropriate program. They chose to use the reciprocal method to develop volleyball skills for these students. Based on the above, the research problem was defined, represented in the.

following main question:

What is the effect of the reciprocal method on developing volleyball skills among students with hearing impairments in Palestine?

From this main question, the following sub-questions emerged:

1.What is the statistically significant difference between the mean scores of tenth-grade students with hearing impairments in the two groups (experimental and control) in the post-test of the cognitive aspect of volleyball skills?

2.What is the statistically significant difference between the mean scores of tenth-grade students with hearing impairments in the two groups (experimental and control) in the post-test of the observation checklist for volleyball skills?

Research Hypotheses:

1.There are statistically significant differences at the significance level ($\alpha \leq 0.05$) between the average scores of tenth-grade students with hearing impairments in the two groups (experimental and control) in the post-test of the cognitive aspect of volleyball skills, favoring the students in the experimental group.

2.There are statistically significant differences at the significance level ($\alpha \leq 0.05$) between the average scores of tenth-grade students with hearing impairments in the two groups (experimental and control) in the post-test of the observation checklist for volleyball skills, favoring the students in the experimental group.

Research Objectives:

The current study aims to achieve the following objectives:

1.To identify the statistically significant difference between the average scores of tenth-grade students with hearing impairments in the two groups (experimental and control) in the post-test of the cognitive aspect of volleyball skills.

2.To identify the statistically significant difference between the average scores of tenth-grade students with hearing impairments in the two groups (experimental and control) in the post-test of the observation checklist for volleyball skills, favoring the students in the experimental group.

Importance of the Research:

The significance of the research lies in:

1.Guiding supervisors and teachers to pay attention to students with hearing impairments.

2.Providing a teaching guide for physical education teachers to assist them in using the reciprocal teaching

approach when instructing students with hearing impairments.

Limitations of the Research:

The research was limited to selecting two equivalent groups of tenth-grade students with hearing impairments at Mustafa Sadek Al-Rafii Secondary School for the Deaf in the West Gaza Directorate during the first semester of the 2022/2023 academic year.

Research Terminology:

A. Reciprocal Teaching: This is a direct approach that involves active learner participation in the learning process, allowing them to engage in educational decision-making. It includes providing immediate feedback to a peer performing an activity, monitoring performance, giving corrections, and discussing. Afterward, roles are exchanged, where the observer becomes the performer, and the performer receives feedback and corrections (Belbass & Mauloud, 2009).

B. Volleyball Skills: These are a set of offensive and defensive movements that follow a specific sequence based on legal principles applied by players in various situations to prevent the ball from hitting the ground. These skills include (serving, reception, setting, attacking, blocking, and court defense) (Hussein et al., 2006).

C. Hearing Impairment: This refers to the loss of an individual's ability to hear, which hinders their acquisition and understanding of language and may result in the inability to speak (Al-Azza, 2002: 110).

Research Methodology and Procedures includes the following aspects:

A.Research Method and Experimental Design: The researchers followed an experimental research approach using an experimental design with two equivalent groups. (control and experimental), including pre-test and post-test applications for volleyball skills.

B.Research Population and Sample: The research population consisted of all tenth-grade students at Mustafa Sadiq Al-Rafii Secondary School for the Deaf, totaling 24 students. They were divided into two groups: a control group of 12 students and an experimental group of 12 students for the second semester of the academic year 2022/2023.

Research Tools

The researchers used a cognitive test and an observation card for volleyball skills.

First Tool: Cognitive Test for Volleyball Skills

The cognitive test for volleyball skills consists of a final version with (25) questions distributed across volleyball skills as follows:

- Purpose of the Test: It aims to measure the extent of possession of volleyball skills among tenth-grade students at Mustafa Sadiq Al-Rafii Secondary School for the Deaf.

- Determining the List of Volleyball Skills: A review of previous studies on volleyball skills, such as Sgro and Barca & Schembri (2020), Aliwi (2018), Hamid and Khudair (2018), Aliwi (2017), and Radi, Hussein, and Jaafar (2010), identified the volleyball skills included in the study unit, which are: underhand serve, overhand serve, underhand pass, overhand pass, and the official rules of volleyball.

-Test Items: The researchers prepared a number of questions at the level of tenth-grade students to measure volleyball skills based on the content of Unit Four from the Physical Education Teacher's Guide. The test items were designed to represent the desired objectives, align with the students' levels, clearly state the requirements, and the questions express volleyball skills, resulting in a preliminary formulation of 25 questions.

-Establishing test instructions: After identifying and formulating the test questions. The researchers established test instructions aimed at clarifying the concept of responding to the test. They described the test, recorded specific student information, specified the test duration, and identified the designated area for answers. Additionally, with the help of a teacher, they read the test instructions in Palestinian sign language before students began answering, ensuring that each student understood the response process clearly and without any confusion.

-Exploratory Application of the Knowledge Test for Volleyball: The volleyball knowledge test was administered in its preliminary form to a sample of 20 students from the 11th grade at Mustafa Sadiq Al-Rafii Secondary School for the Deaf. This was done to ensure the validity of the test, calculate the difficulty and discrimination coefficients of the items, as well as to determine the time required for the test and to verify its reliability and consistency.

-Test Duration: The response time was calculated for the first five students who submitted their papers and the last five students who submitted their papers, totaling 39 minutes.

-Validity of the Test:

A. **Judges' Validity:** The test in its preliminary form was presented to a group of specialists in the field of curriculum and physical education teaching methods, as well as a group of experienced teachers.

B. **Internal Consistency Validity:** By calculating the correlation coefficients between the scores of each question in the test and the total score, it was found that all test questions were statistically correlated with the total score at a significance level of (0.01). Thus, the test questions possess appropriate internal validity, and all 25 questions are capable of measuring what they were designed to measure.

-Verification of Test Reliability: The researchers calculated the reliability coefficient through:

A. **Cronbach's Alpha:** The value of Cronbach's alpha was (0.81), indicating that the test has a high degree of reliability.

B. **Split-Half Method:** It was found that the Spearman-Brown coefficient was high, equal to (0.91), which demonstrates the reliability of the measure.

-Calculating Discrimination Coefficients:

The role of the discrimination coefficient is to determine the effectiveness of a question in distinguishing between high-ability students and low-ability students. The discrimination coefficient is calculated to eliminate items with very low or very high discrimination coefficients in the test. The difficulty coefficients ranged from (0.37 to 0.98), and the results are shown in Table (1).

Table (1): Shows the Discrimination Index for Each Question of the Volleyball Cognitive Test

Question	Discrimination coefficients	Difficulty coefficients	Question	Discrimination coefficients	Difficulty coefficients
Q1	35%	59%	**Q14**	25%	65%
Q2	30%	60%	**Q15**	30%	67%
Q3	33%	67%	**Q16**	30%	65%
Q4	27%	65%	**Q17**	29%	60%
Q5	30%	61%	**Q18**	31%	65%
Q6	35%	60%	**Q19**	35%	60%
Q7	33%	65%	**Q20**	29%	70%
Q8	28%	60%	**Q21**	33%	58%
Q9	25%	70%	**Q22**	25%	65%
Q10	33%	55%	**Q23**	26%	60%
Q11	32%	60%	**Q24**	28%	65%
Q12	30%	60%	**Q25**	25%	60%
Q13	35%	65%			

Second Tool: Observation Checklist:

After reviewing the educational literature and previous studies related to the research problem, the researchers developed an observation checklist containing 44 questions distributed across four domains: (underhand serve, overhand serve (tennis), underhand pass, and overhand pass). The researchers utilized a quantitative rating scale to assess the performance level of students in each skill according to a five-point Likert scale, with ratings as follows: (very high, high, medium, low, very low), corresponding to scores of (1, 2, 3, 4, 5).

-Validity of the Observation Checklist:

A. **Validity**: After presenting the observation checklist in its preliminary form to a number of judges and specialists, the researchers reformulated some items that did not reach consensus on their appropriateness for the study, ensuring that the checklist maintained its dimensions and the number of items in each dimension.

B. **Internal Consistency Validity:** The researchers calculated the Pearson correlation coefficients between the score of each item in the dimension and the total score of that dimension. It was found that all correlation coefficients for the scores of the items in the dimensions (underhand serve, overhand serve (tennis), underhand pass, and overhand pass) with the total score of the respective dimension were statistically significant at the (0.01) level. Thus, it is evident that the items in the dimension possess a high degree of internal consistency validity, meaning the dimension measures what it was designed to measure.

C. **Construct Validity:** To calculate construct validity, the researchers calculated the correlation coefficient between the score of each dimension of the observation checklist and the total score. It was found that all correlation coefficients for the dimensions of the observation checklist and their total score were statistically significant at the (0.01) level, demonstrating a high degree of construct validity, meaning the tool measures what it was designed to measure.

-Reliability of the Observation Checklist:

A. **Split-Half Method:** The reliability of the observation checklist was calculated using the split-half method by finding the Pearson correlation coefficient between the total scores of the odd-numbered items and the total scores of the even-numbered items. The values of all reliability coefficients were good, with the split-half reliability coefficient for the total score of the observation checklist being (0.93), indicating a good level of trust in this checklist.

B. **Cronbach's Alpha: Using Cronbach's Alpha:** It was found that all alpha values were acceptable, with the Cronbach's Alpha value for the total score of the observation checklist being (0.97). This indicates that the tool possesses a high degree of validity and reliability, making it suitable for application to the entire study sample.

-Controlling Variables Before Starting the Experiment:

The researchers controlled for several variables that might affect the development of volleyball skills:

A. **Controlling for Weight, Height, and Age:** The researchers recorded the ages of the students in both groups from the teachers' files at the beginning of the academic year (2022-2023). The students' ages ranged from 15 to 17 years, with an average of approximately 16 years. The researchers used the independent samples t-test, which revealed no differences between the control and experimental groups in terms of weight, height, and age. This was indicated by the calculated t-value being less than the critical t-value, demonstrating equivalence between the two groups regarding weight, height, and age.

B. **Equivalence of the Groups in the Knowledge Test and the Observation Checklist for Volleyball:** A pre-test for volleyball skills was administered to both groups, followed by the calculation of the independent samples t-test. The significance level for the total score of the study tools exceeded (0.05), indicating no statistically significant differences between the mean scores of 10^{th}-grade students in the experimental and control groups in the preliminary application of the knowledge test and the observation checklist for volleyball skills. This result indicates the equivalence of the two groups (experimental and control).

The ADDIE Educational Model:

The researchers adopted the ADDIE model to create an instructional design using an iterative approach to develop volleyball skills for 10^{th}-grade students at Mustafa Sadiq Al-Rafii Secondary School for the Deaf. This model consists of five essential stages, outlined as follows:

-Stage One: Analysis:

The researchers identified the characteristics of the learners, established the educational objectives for each topic according to Bloom's Taxonomy, determined the main subjects, analyzed the educational content, and assessed the learners' readiness to learn volleyball skills.

1.Identifying Learner Characteristics:

The process of selecting an appropriate program to achieve the desired objectives for individuals with hearing impairments involves a precise description of their characteristics. This includes identifying important information about their academic, physical, social, and cognitive development. These individuals often face numerous challenges and obstacles that affect their ability to communicate with others and participate in education. Therefore, these aspects must be considered when choosing the appropriate educational program.

The research sample consisted of 24 students with hearing impairments enrolled in the 10^{th} grade at Mustafa Sadiq Al-Rafii Secondary School for the Deaf for the academic year 2022-2023.

All students were equivalent in terms of weight, height, and age, with an average weight of 63 kilograms, an average height of 154 cm, and an average age of 16 years.

2.Defining Educational Objectives:

- It is expected that after implementing the program, the student will be able to:
- Master the skill of serving from above and below correctly.
- Perform both overhead and underhand passing, considering the technical aspects.
- Execute quick attacks within the context of team play.

- Actively participate in team play.
- Adhere to the rules of the game during individual and team times in matches.
- Acquire the technical skills for volleyball, such as underhand and overhead serves and underhand and overhead passing, and understand the official rules of the game.
- Comprehend and grasp the physical abilities and body specifications required for volleyball players.

3. Defining Key Topics:

- Topic One: Implementation of Overhead Serving.
- Topic Two: Implementation of Underhand Serving.
- Topic Three: Implementation of Underhand Passing.
- Topic Four: Implementation of Overhead Passing.
- Topic Five: Team Play and Implementation of the Official Volleyball Rules 2021-2024.

4. Identifying the Educational Resources and Materials Accompanying the Proposed Interactive Program:

-Methods:

-The researchers used the interactive method (peer coaching) due to its suitability for the nature of the educational skills.

-Sources and Material for Field Application:

-The researchers prepared and organized the tools (volleyballs, plastic cones, net posts, volleyball net) and the playing fields.

-All safety measures were taken, and the playing field was planned, along with the preparation of study tools for the pre-application.

5. Content Analysis:

The researchers were keen to follow recognized scientific standards in analyzing and organizing the content to ensure it is aligned with the objectives, significant, valid, comprehensive, and considerate of the individual differences among students. Based on this, the researchers analyzed the content of Unit Four (Volleyball) from the Physical Education curriculum for the tenth grade.

Source: Physical Education Teacher's Guide for the Tenth Grade. The fourth unit consists of:

-Topic One: Quick Attack, including (technical steps, performance methods, and common errors).

-Topic Two: Court Defense Method: "This is one of the defensive formations on the court, which is achieved by covering different areas of the court to save balls hit by the opposing team, passing them using the arms or one arm, whether from below or above, to the setter to execute the attack."

-Topic Three: Team Play, which includes applying volleyball skills (underhand serve, overhand serve, underhand passing, overhand passing, and the official rules of volleyball).

-Stage Two: Design

The design stage includes a series of steps that the researchers followed based on the information derived from the analysis stage of the ADDIE model.

1.Defining Behavioral Objectives:

- researchers set (23) objectives based on Bloom's taxonomy of objectives, as illustrated in the following table, which were achieved during the sessions with the students.

2.Identifying the Dimensions of Volleyball Skills:

-The researchers relied on the following tools and resources to gather information and data related to the study:

-Scientific references and sources that addressed the topic of volleyball.

-Previous studies and research in this field, including Nazzal (2021), Sgro & others (2020), Al-Abayji and Al-Zubaidi (2019), Ibrahim (2019), Carrascal & others (2019), Mortada (2019), Al-Aliwi (2018), Hamid and Khudair (2018), Al-Aliwi (2017), Ahmad and Kazem (2015), Khalaf and Majid (2015), Hassan, Mushtat, and Abdul Qadir (2015), and Radi, Hussein, and Jaafar (2010), along with the findings of the researchers.

-Expert opinion surveys.

Based on the previous steps, the researchers identified the dimensions of the cognitive test and the observation card for volleyball skills. They presented these to university professors, specialists, supervisors, and teachers. After receiving their approval, the items for the cognitive test and the observation card were prepared. These were then submitted to experienced supervisors and evaluators to express their opinions regarding the appropriateness of the dimension for the tool and the suitability of the items for the dimension.

A. The dimensions of the cognitive test for volleyball skills are as follows
-Overhead serve.
-Underhand serve.
-Underhand passing.
-Overhand passing.
-Official rules of volleyball 2021-2024.
B.The dimensions of the observation checklist are as follows:
-Overhead serve.
-Underhand serve.
-Underhand passing.
-Overhand passing.
3. Teaching Method:
-The researchers adopted a reciprocal learning method (peer guidance) with sequential steps to develop volleyball skills among tenth-grade students at Mustafa Sadiq Al-Rafii Secondary School for the Deaf.
-The students were divided into six cooperative pairs, where each student had a specific role: the first student acted as the teacher, explaining the skill, helping their peer apply it, and assessing their performance, while the second student listened and asked questions to gain a clearer understanding. The teacher alternated the roles within each pair, and the same steps were repeated for the remaining skills.
4. Designing Assessment Tools:
-The researchers designed two tools to assess students, which were reviewed by expert evaluators:
-Cognitive Test for Volleyball Skills: This test consists of five sections, **the first section** focuses on the Underhand Directed Serve and includes five items, **the second section:** Overhand Serve (Tennis Serve), includes five items, **the third section**: Underhand Passing, includes five items, the fourth section: Overhand Passing, includes five items, and the fifth section: Official Volleyball Rules, also includes five items.
-Observation Checklist: It consists of four sections. The first section: Underhand Forearm Serve includes 11 questions; the second section: Overhand Serve (Tennis) includes ten items; the third section: Underhand Passing includes 13 questions; and the fourth section: Overhand Passing includes ten items.
5- Designing a Plan to Implement the Training Program Using the Reciprocal Style for Volleyball Skills:
The researchers designed a timeline for implementing the training program using the reciprocal style, aligning it with the Ministry of Education's plan for physical education in Palestine. Tasks were distributed to each student throughout the training period.
-Stage Three: Development:
-The researchers prepared and organized the tools and locations by setting up a volleyball court, a volleyball net, volleyballs, a whistle, and cones.
-The researchers employed the reciprocal style by dividing the students into six pairs, assigning each student in the group a specific role. The first student acted as the teacher, explaining the skill, while the second student asked questions for clarification and practiced the skill under the guidance of the first student.
-Stage Four: Implementation
The researchers implemented the study experiment using the reciprocal style to develop volleyball skills among tenth-grade students at Mustafa Sadiq Al-Rafii Secondary School for the Deaf through:
-Identifying the study sample from the students of Mustafa Sadiq Al-Rafii Secondary School for the Deaf.
-Preparing educational material for the students.
-Dividing the students into pairs for explanation and practice.
-Monitoring the students' performance during the application of the reciprocal style and role-switching among the six groups, providing necessary guidance and instructions.
The experiment was conducted over four weeks, during which the experimental group of students was taught using the reciprocal style. The researchers divided the students into six cooperative pairs, with each group consisting of two students. Each student in the group had a specific role, which was defined as follows:
A. The first student: explained a volleyball skill using Palestinian sign language, according to the table prepared by the researchers based on the physical education teacher's guide.
B. The second student: paid close attention and asked the first student questions to gain more details about the

skill, and then proceeded to execute (apply) the designated volleyball skill according to the table prepared by the researchers.

C. Researcher's Role: The researcher acted as an observer, monitoring the work of the groups and the conversation between the two students. They provided feedback whenever necessary and assisted with a sign language specialist.

The researcher rotated the roles among the students in each group at the end of each session, while the control group was taught using the conventional method.

Stage Five: Evaluation

In this stage, the researchers followed the ADDIE model to create the instructional design using the reciprocal style to develop volleyball skills for tenth-grade students at Mustafa Sadiq Al-Rifai Secondary School for the Deaf. The study tools, which included a cognitive test and an observation card for volleyball skills, were verified for their validity by specialists. These tools were applied to a pilot sample, and necessary adjustments were made to ensure their suitability for measurement.

Procedures for Implementing the Study:

1.Review the literature, educational research, and previous studies related to the reciprocal style and volleyball.
2.Identify the volleyball skills to be taught during the semester.
3.Prepare a cognitive test and an observation card for volleyball skills, presenting them to a group of specialists and experts for necessary modifications, determining their validity and reliability to reach their final form and ensure alignment with the specifications table.
4.Ensure the readiness of the tools at the selected school before starting the implementation of the program.
5.Formulate the research problem as a main question, from which subsidiary questions are derived, while also determining the hypotheses, significance, and objectives of the study.
6.Analyze the content of the selected material.
7.Establish a list of concepts, objectives, and skills to be developed.
8.The researchers applied the study tools to a pilot sample.
9.Apply the study tools beforehand to the actual sample of the study in order to ensure the equivalence of the experimental and control groups.
10.Analyze the results obtained statistically using appropriate statistical treatments with the SPSS program.
11.Identify the study's recommendations and suggestions.

Statistical treatments used in the study:

The researchers used the following statistical methods:
1.Difficulty and discrimination indices for each question in the test items.
2.Pearson correlation coefficient to verify internal consistency.
3.Cronbach's alpha to calculate the reliability of the scientific concepts test and the tendency scale.
4.Independent Sample T-Test.

Research Results:

First: Answering the first question, which states: What are the statistically significant differences between the average scores of tenth-grade students in the experimental and control groups in the post-application of the cognitive skills test for volleyball? To test the validity of the hypothesis related to this question, which states: "There are statistically significant differences at the significance level ($\alpha \leq 0.05$) between the average scores of the post-test for students in the control group and the experimental group in the cognitive skills test for volleyball in favor of the experimental group"; the independent samples t-test was calculated, as shown in Table (2):

Table (2): Results of the t-test for determining the significance of the differences between the average scores of students in the experimental and control groups in the post-application of the cognitive skills test for volleyball.

Dimensions	Group	Number	Arithmetic Average	Standard Deviation	Degrees of freedom	T-value	P-value	Statistical Significance
Facing Underhan	Control	12 12	1.69 3.74	.10 .42	22	- 13.3	.041	Statistical function

d Serve	Experimental					8		
Overhand Serve Skill	Control Experimental	12 12	1.96 3.47	.57 .34	22	-6.42	.019	Statistical function
Underhand Pass	Control Experimental	12 12	1.81 3.47	.41 .23	22	-9.92	.024	Statistical function
Overhand Pass	Control Experimental	12 12	1.68 3.78	.24 .56	22	-9.81	.036	Statistical function
Official Volleyball Rules	Control Experimental	12 12	1.72 3.61	.09 .30	22	-17.39	.002	Statistical function

The previous table shows statistically significant differences at the ($\alpha \leq 0.05$) level between the experimental and control groups across all dimensions of the test. The significance value (sig.) was less than 0.05. Thus, there are statistically significant differences between the average scores of tenth-grade students in the experimental group, who learned through the reciprocal style, and those in the control group, who learned through traditional methods. The experimental group outperformed the control group in the overall score and in all areas of the cognitive test for volleyball skills.

The researchers believe that the reciprocal teaching method significantly impacted students' acquisition of volleyball skills. It enhanced their ability to perform the role of a teacher when explaining skills to peers and facilitated easier explanations of required skills. The method fostered communication among students, reducing shyness and increasing their motivation to engage in discussions and work diligently. This effort may stem from students preparing lessons and gearing up to present as teachers to their classmates.

The current study aligns with the findings of Bernimpong et al. (2021), indicating that the reciprocal teaching method significantly enhances students' ability to hit a shuttlecock. Additionally, Ali (2020) highlighted the effectiveness of reciprocal learning in teaching slow and stable motor skills in gymnastics. Fleyh (2020) noted that the reciprocal method was more effective than the American and inclusion methods for skills like tapping, passing, receiving, and shooting from a stationary position. To determine the impact of the reciprocal method on volleyball skills, the eta squared statistic was calculated by determining the differences between the post-test means and the degrees of freedom, and the effect size was computed using eta squared.

Table (3): Results of Eta Squared (η^2) and Effect Size in the Cognitive Test

Dimensions	T-Value	Eta	Eta-Squared Value	Effect Size
Facing Underhand Serve	-13.38	0.96	0.93	Larg
Overhand Serve Skill	-6.42	0.86	0.75	Larg
Underhand Pass	-9.92	0.94	0.88	Larg
Overhand Pass	-9.81	0.93	0.87	Larg
Official Volleyball Rules	-17.39	0.98	0.96	Larg

It is clear from the previous table that the value of eta squared (η^2) is greater than 0.14, indicating a high level, which shows that the effect size was very large. This means that the use of the reciprocal teaching method had a significant impact on the development of volleyball skills in the overall scores across all areas of the cognitive test for volleyball skills.

This can be attributed to the reciprocal style, which positions the student as a teacher in explaining skills. This approach enhances student motivation for research, discovery, and integration of various volleyball skills in line with their physical and mental capabilities. Consequently, the impact size was significant, whereas the traditional method relied more on the teacher's role than on the student's involvement in explanation and discussion.

Secondly: To answer the second question, which states: What are the statistically significant differences between the average scores of tenth-grade students in the experimental and control groups in the post-application of the observation card for volleyball skills? The hypothesis related to this question states that there are statistically

significant differences at the significance level ($\alpha \leq 0.05$) between the average scores of the post-measurement for the control group and the experimental group in the observation card for volleyball skills in favor of the experimental group students. The "t" test for independent samples was calculated, as shown in Table (4).

Table (4): Results of the T-test to Determine Statistical Significance of Differences Between the Average Scores of Students in the Experimental and Control Groups in the Post-Application of the Observation Checklist

Dimensions	Group	Number	Arithmetic Average	Standard Deviation	Degrees of freedom	T-value	P-value	Statistical Significance
Facing Underhand Serve	Control Experimental	12 12	3.74 1.60	.422 .363	22	2.14	.041	Statistical function
Overhand Serve Skill	Control Experimental	12 12	3.47 1.55	.339 .141	22	1.92	.019	Statistical function
Underhand Pass	Control Experimental	12 12	3.47 1.53	.229 .205	22	1.94	.024	Statistical function
Overhand Pass	Control Experimental	12 12	3.78 1.67	.558 .362	22	2.11	.036	Statistical function

The previous table indicates statistically significant differences at the ($0.05 \alpha \leq$) level between the average scores of students in the control and experimental groups in the post-application of the observation checklist. The p-value (sig.) was less than the significance level (0.05).Consequently, there are statistically significant differences in the post-test measurements between the control and experimental groups in favor of the experimental group, both in the overall score and in all areas of the observation checklist for volleyball skills.

The hypothesis aligns with Ali's study (2020), which found differences between the first experimental group using the direct instruction methodand the second experimental group that used the reciprocal teaching method, favoring the group that utilized the reciprocal teaching method. It also corresponds with Flih's study (2020), indicating a positive effect among the first group using the direct instruction method, the second group using the reciprocal teaching method, and the third group using the inclusion method, and it was the most effective for the second group that used the reciprocal teaching method.

The study by Adham (2016) confirms that the reciprocal teaching method significantly influences the learning and development of high dribbling skills in basketball. The reciprocal teaching method significantly impacts improving female students' retention of high dribbling skills in basketball compared to the control group that employed the traditional approach. It aligns with the study by Salman and Saeed (2010), which highlights the impact of the reciprocal teaching method on learning the skills of serving and receiving in volleyball. This effect was in favor of the second experimental group among the three experimental groups that used the reciprocal teaching method in learning volleyball skills.

Table (5): Results of Eta Squared (η^2) Coefficient

Dimensions	T-Value	Eta	Eta-Squared Value	Effect Size
Facing Underhand Serve	2.14	.96	0.85	Larg
Overhand Serve Skill	1.92	.84	0.99	Larg
Underhand Pass	1.94	.84	0.91	Larg
Overhand Pass	2.12	.93	0.81	Larg

Recommendations of the Research:

1.Utilize the reciprocal teaching method in learning various sports skills.

2.Train teachers to implement the reciprocal teaching method through workshops and experience sharing.

3.Familiarize physical education and sports teachers with the findings of studies and research that addressed the

reciprocal teaching method and its application in teaching various sports skills to students.

4.Encourage physical education teachers to use the reciprocal teaching method in instructing various volleyball skills to avoid the rigidity of traditional teaching methods.

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