

The Influence of Using the Electronic Teaching in Self –Education and Its Cognitive, Kinetic Content of The Skill of Sending and Receiving of Volleyball for Girls at The Secondary Stage at The Directorate of Education in Irbid District

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Abstract

This study examines the impact of e-learning on self-learning and the cognitive and motor aspects of the skills of sending and receiving in volleyball among female secondary school students. The sample consisted of 31 female students divided into two groups: the experimental group (16 students) who studied using an electronic educational bag, and the control group (15 students) who studied the same skills using traditional methods. The results showed significant differences between the pre- and post-measurements of the experimental group in all volleyball skills and their cognitive content. Additionally, there were significant differences in the post-application of volleyball skills in favor of the experimental group. Based on these findings, they study recommends using the developed electronic educational bag to enhance students' skills in sending and receiving in volleyball and improve their related knowledge.

Keywords: *Electronic Teaching, Reception and Sending Skills in Volleyball, Secondary School, Volleyball*

INTRODUCTION

In our current era, characterized by an explosion of knowledge and technological progress, many countries have embraced technology in their educational institutions to enhance the teaching and learning processes. The aim is to improve education, ensure future individual performance based on solid methodological foundations, and promote a balanced development of individuals. These institutions provide technological resources such as laboratories to support education. Proficient teachers can utilize these technologies in various forms to serve both themselves and their students (Macintyre, 2010).

This highlights the significance of e-learning, which contributes to personalized education. Modern educational trends emphasize the importance of individual learning to allow students to explore their inclinations, abilities, talents, and readiness. Software applications have been introduced to physical education to foster the development of a well-rounded, active, and self-reliant generation capable of acquiring knowledge and skills.

Various forms of software, including multimedia programs, information networks, programmed booklets, electronic educational bags, compelling texts, and educational computers, are utilized in general education and physical education. This study focuses on the application of self-learning through the use of electronic educational bags compared to traditional teaching methods.

Traditional education relies on books with written texts and limited visual aids, placing the teacher in the role of transmitter and prompter. Despite the numerous advantages of traditional education, such as its low cost and accessibility to a broad segment of society, it has limitations. These include the teacher's role transforming from a supervisor to a prompter, limiting the delivery of information to indoctrination, and students relying primarily on memorization. Traditional education also struggles to keep up with constant content updates due to financial constraints and the inability to cater to individual differences among students (Al-Awaisha, 2021).

On the other hand, electronic educational bags offer a model of individualized learning. They represent a modern technological intervention in teaching that benefits both teachers and students in the field of education. Although the concept of educational bags originated in the 1960s, their electronic implementation was limited until recently (Al-Diwan, 2006). The electronic educational bag is a knowledge container that contains several

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sources of learning. It is designed as an integrated multimedia program used in teaching and learning various cognitive and educational units. The program is appropriate to the learner's capabilities and suits their environment. Learning through this bag increases the learner's knowledge, experience, and skills, qualifying them to meet life situations related to what they have gained from the bag's content (Saraya, 2007, p. 84).

The electronic educational bag has several types, classified according to their use, including the objectives and information bag, the work bag, the reflective bag, the associated bag, and the display bag (Ismail, 2009). It includes multiple components such as a page for the bag's title, a general idea about it, its behavioral goals, pretests, activities, alternatives to these activities, and a guide for the self-evaluation program. Additionally, there is a form for correcting answers (Zaghloul et al., 2001, p. 142).

Gabein (2001) pointed out several advantages of the electronic educational bag. It helps solve the problem of the continuous increase in the number of students, which corresponds to the lack of qualified teachers. It also takes into account individual differences among learners through several alternatives in the bag. The bag encourages students to innovate and think independently, allowing them to learn at their own pace, wherever and whenever they want. However, it has drawbacks, represented by the high material cost, especially during the initial preparation phase, as it requires devices, equipment, means of communication, and continuous training. Students may also face social separation due to the difficulty of getting to know their classmates. Sometimes, students get bored due to the lack of direct interaction with their teacher, and teachers face difficulties in evaluating students due to a lack of credibility and increased distractions. The process of producing the electronic educational bag is carried out scientifically, systematically, logically, organized, and sequentially. It starts with analysis, followed by planning, implementation, production, and ends with evaluation (Al-Hinawi, 2002).

In physical education, Al-Ghaith and Hassan (2020) added that teaching and learning through computers have been introduced in various fields of physical education, including the game of volleyball. Volleyball is distinguished from other sports by its small court area. While many physical education teachers believe that all volleyball skills are taught in the same style and manner, the truth is quite the opposite. Each skill has its own teaching characteristics. The transmission skill, for example, is the beginning of playing volleyball and the first opportunity for the team to score a point. Successful transmission means continuity of play and progress towards victory. Several types of transmission are used by players, including transmission from below, from the confrontation, and from the side (Youssef, 2015).

One of the volleyball skills is reception, where the player defends the ball sent by the opposing team. When the students receive the ball from below, it is prepared for the designated player, known as the pass from below (Boulis, 2006).

Problem of the Study: Technological self-education through multimedia, such as the electronic bag, transparencies, programmed booklets, etc., has entered the modern teaching community to activate the role of the student in light of current technological advancements. Here, the role of the successful teacher becomes significant as they play a crucial part in employing this multimedia for students to obtain information independently. This fact confirms the presence of the teacher at the center of the educational process, contrary to the belief that the role of the teacher can fade away with the presence of electronic self-learning methods.

From here, the problem of the study emerged: Physical education teachers need technological means and programs that help enhance the self-teaching process because they still rely on traditional teaching methods and believe they are the best in the field. It is essential to recognize their mental abilities and talents.

The second problem that the researcher noticed is the lack of support and reinforcement for physical education teachers in their lessons for skill models. The use of modern electronic means, close to real-life models, that students can refer to in times of need is particularly lacking, especially in teaching and learning complex volleyball skills.

Hence, it is possible to use modern technological educational means to cover some lessons in the absence of specialized subject teachers and assist the teachers who occupy the subject but require more specialization in skilled performance. From this standpoint, this research idea may contribute to solving multiple problems in volleyball. Therefore, the researcher decided to focus on high-level technical skills, namely transmission and reception, from the volleyball curriculum. These skills require a high degree of proficiency, and the researcher thought about employing advanced teaching methods to help students master these desired skills.

Importance of the Study

The importance of this study stems from:

- Designing an electronic educational bag in the field of volleyball for female students of the first secondary grade, the literary branch, at Jumana Secondary School for Girls.
- Providing those in charge of the teaching process in schools with an understanding of the importance of the electronic educational bag in the field of volleyball for female first-grade secondary students in the literary branch at Jumana Secondary School for Girls.
- This study is one of the few that addresses the use of the electronic educational bag in self-learning, its cognitive and motor content, and the skill of transmitting and receiving in volleyball for female students of the first secondary grade in the literary branch at Jumana Secondary School for Girls.

Objectives of the Study: This study aims to:

- Identify the effect of teaching with the electronic educational bag on self-learning, its cognitive and motor content, and the skill of transmitting and receiving in volleyball for female students of the first secondary grade, the literary branch, at Jumana Secondary School for Girls.
- Identify the effect of teaching in the traditional way on self-learning, its cognitive and motor content, and the skill of transmitting and receiving in volleyball for female first-grade secondary students of the literary branch at Jumana Secondary School for Girls.
- Compare the effect of teaching by the two methods on self-learning, its cognitive and motor content, and the skill of transmitting and receiving in volleyball for female students of the first secondary grade, the literary branch, at Jumana Secondary School for Girls.

Study Hypotheses: The study sought to identify the following hypotheses:

- There are statistically significant differences at the level of significance ($\alpha \geq 0.01$) among the members of the experimental group in self-learning, its cognitive and motor content, and the skill of transmitting and receiving in volleyball among first-grade secondary students, the literary branch at Jumana Secondary School for Girls, between the pre and post measurements, in favor of...

Definition of Terms:

- **Electronic Educational Bag:** It is an educational material that is programmed and contains cognitive, skilled, and legal information in volleyball, accompanied by sound and motion pictures, providing students with different alternatives to obtain information.
- **Sending from below:** It is one of the most accessible transmissions used in volleyball and is a priority for learning the game. It requires simple strength and is an easy reception by the team.
- **Lateral transmission from below:** It is more common in open courts, and it is not easy to receive the ball. This type is characterized by the speed of the ball's rotation and its height. It requires more accuracy in directing the ball.
- **Receiving the transmission:** It refers to defending the ball sent by the opposing team player and is called the pass from below using the arms to prepare the ball for the receiving player (procedural definition).

LITERATURE REVIEW

The sending skill in volleyball refers to the act of effectively and accurately transmitting the ball from one player to another or over the net to the opposing team's side. This skill is crucial for setting up attacks and maintaining control during the game.

When it comes to the sending skill in volleyball, there are several important aspects to consider:

1. **Technique:** Proper technique is essential for an effective send. This includes using the hands and fingers to control the ball's trajectory and spin, as well as using the legs and core for stability and power.
2. **Accuracy:** A good sender should aim for accuracy in their sends. This means placing the ball in the desired location for the receiving player or targeting specific areas on the opponent's side to exploit weaknesses.
3. **Decision-making:** The sender must make quick decisions on whether to send the ball to a specific player, to a specific area, or to execute a particular play. This requires good court awareness and an understanding of the game situation.
4. **Communication:** Effective communication between the sender and other players is crucial. This includes using hand signals or verbal cues to indicate where the send should go or what type of send to perform.
5. **Adaptability:** The sender needs to adapt their sends based on various factors, such as the position of the receiving player, the opponent's defensive setup, and the speed of the game. Being able to adjust and make split-second decisions is essential.
6. **Timing:** Timing is key in sending the ball. The sender must synchronize their send with the movement and position of the receiving player to ensure a smooth and effective transmission.

Overall, the sending skill in volleyball requires a combination of technical proficiency, decision-making abilities, communication, and adaptability. Mastering this skill can greatly contribute to a team's success by facilitating effective plays and maintaining control of the game.

The volleyball reception skill, also known as passing or digging, refers to the ability to receive the opponent's attack or serve and control the ball to facilitate the team's offensive play. This skill is essential for maintaining ball possession, initiating attacks, and preventing the opposing team from scoring easily.

When it comes to the reception skill in volleyball, there are several important aspects to consider:

1. **Technique:** Proper technique is crucial for a successful reception. This involves using the forearms or platform to create a flat surface and absorb the impact of the ball. The player should focus on maintaining a solid platform and using a soft touch to control the ball's trajectory.
2. **Footwork:** Footwork plays a significant role in reception. The player needs to move quickly and position themselves correctly to anticipate the incoming ball and maintain balance. Proper footwork helps ensure that the player is in a stable position to execute an accurate pass.
3. **Anticipation:** Anticipating the opponent's attack or serve is essential for a good reception. The player should read the game, analyze the opponent's positioning and body language, and anticipate the direction and speed of the ball. This allows the player to react quickly and be in the right position to receive the ball effectively.
4. **Communication:** Communication between teammates is crucial during reception. Players need to use verbal cues or hand signals to communicate who will take the ball, especially when multiple players are

in close proximity. Clear and effective communication helps avoid confusion and ensures that the ball is received by the most suitable player.

5. **Focus and Concentration:** Reception requires intense focus and concentration. The player needs to stay alert, track the ball's movement, and react quickly to its trajectory. Maintaining mental focus helps in making split-second decisions and executing accurate passes.
6. **Adaptability:** The ability to adapt to different types of serves or attacks is important in reception. Players should be capable of adjusting their body position, arm angles, and platform to receive various types of balls, such as float serves, topspin serves, or spikes. Adaptability allows players to handle different situations effectively.
7. **Recovery:** After the reception, players need to quickly transition into a suitable position for the next play. This involves moving efficiently and being ready to set up an attack or provide support to teammates.

Mastering the reception skill in volleyball requires consistent practice, technical proficiency, and an understanding of the game. It is a fundamental skill that contributes to the team's success by enabling effective ball control, setting up scoring opportunities, and maintaining defensive stability.

Previous Studies

Ahmed et al. (2009) aimed at designing an educational bag to learn the skill of sending in volleyball and to identify the effect of using this bag on learning that skill. The sample consisted of young players from the Housing Youth Forum, aged 14–15 years. The results showed the effectiveness of the educational bag prepared by the researchers in learning technical performance and the accuracy of the skill of sending from above in volleyball. The control group achieved clear progress in learning performance and technical accuracy of this skill, but with less progress than what was achieved by the experimental group.

Hussein (2011) examined the effect of a computerized educational program on learning some transmission skills, arbitration signals, and investing academic learning time in a volleyball lesson. The researcher used the experimental method on a sample of eighth-grade students at Anwar Al-Sabah School, affiliated with the Directorate of Private Education in Amman. The study sample was divided into two groups, one of which was the experimental group that used computerized software and consisted of 17 students. The other control group used the regular (traditional) program and consisted of 17 students. The study's results revealed that computerized educational software positively affected learning some types of serving skills and volleyball arbitration signals among the experimental group, between the pre- and post-measurements, and in favor of the post. The variable of arbitration signals' statistical significance did not indicate improvement among the control group members between the pre- and post-measurements. However, when comparing the experimental and control groups in the post-measurements, the statistical results indicated progress in favor of the experimental group, which used computerized educational software, compared to the control group that used the regular (traditional) program to learn the types of volleyball transmission skills. The statistical results also indicated that the computerized educational software positively affected the investment of academic learning time compared to the regular (traditional) program.

Nouri (2013) studied the effect of intensive and distributed styles accompanied by the educational bag on developing the accuracy of the volleyball smash performance. The first experimental group used the intensive method, while the second experimental group used the distributed method. The study aimed to identify which method, in combination with the self-education method of using the educational bag, had a greater impact on developing the accuracy of the smashing performance among young individuals aged 14-16 in Maysan Governorate for the volleyball game. The researcher concluded that both the intensive and distributed methods, when accompanied by the educational bag, were effective in providing essential information used as feedback by the learners. However, the distributed method used by the second group showed better performance accuracy compared to the intensive method used by the first group.

Al-Esaub's (2015) study aimed to identify the impact of computerized physical education lessons based on the knowledge economy on learning some volleyball and gymnastics skills at the skill level and life skills level among fifth-grade students. The study sample consisted of male and female students divided into control and experimental groups. The descriptive approach was used to suit the nature of the study, and a questionnaire consisting of 40 items was distributed to the study sample. The study concluded that computerized physical education lessons were effective in developing the skill level of fifth-grade students in volleyball and gymnastics.

Jawarneh (2017) studied the impact of designing an electronic educational bag on learning some volleyball skills and its cognitive content for people with hearing disabilities. The sample consisted of 19 male and female students within the age group of 14 years. The sample was intentionally chosen and randomly distributed into two groups: the first experimental group and the second control group. The experimental group was taught some volleyball skills through the electronic bag prepared by the researcher, while the control group learned the same content using the traditional method. The experimental method was used to suit the nature of the study. The study results showed statistically significant differences among the experimental group members between the pre- and post-measurements in favor of the post-measurement. The results also showed statistically significant differences among the control group members between the pre- and post-measurements in favor of the post-measurement, while no statistically significant differences were found in the skills of sending from above (strong tennis), receiving from above, or crushing hitting in the post-measurement.

Wilson and Hillier (1999) explored the effect of a computerized volleyball program on the performance of ninth-grade female students. The study sample consisted of 69 students who were distributed into an experimental group and a control group. The results showed that students who used the computerized programs achieved higher scores, improved their performance, and had positive attitudes towards using the computer.

Adams' (2000) study aimed to determine the difference between computer-based instruction and teacher-directed instruction on students' golf performance in the United States. The sample consisted of seven students, and the experimental method was used in the study. The results showed that there were no statistically significant differences between computer-based education and traditional education.

Wilson et al. (2000) investigated students' attitudes towards using computer programs to learn volleyball skills in physical education. The study sample consisted of 33 ninth-grade students. The results showed that the students' attitudes towards this type of learning were positive, and the researchers recommended using computer programs in physical education lessons.

Alhayak (2003) studied the effect of using computer programs to assist in teaching basketball skills on the performance level of students in the Faculty of Physical Education. The study sample consisted of two groups: the control group (21 male and female students) and the experimental group (26 male and female students). The control group was taught traditionally, while the experimental group was taught using computers. The results of the study showed statistically significant differences in favor of the experimental group.

Reis et al. (2010) studied the physiological determinants of breaststroke swimming. The study aimed to reveal the effectiveness of a training program based on the use of computer simulations of performance in improving the performance of a sample consisting of 22 swimmers. The swimmers were chosen randomly and divided into two groups: the control group consisting of 12 swimmers and the experimental group consisting of 10 swimmers. Baseline measurements were taken before using the program with the experimental group. The results of the study showed that using computer simulations for optimal performance during breaststroke effectively improved the swimmers' performance in the 100- and 200-meter competitions.

The current study is distinguished from other studies in that the researcher prepared an electronic educational bag based on leveraging the advantages of computer technology for learning some volleyball skills among secondary school students. To the best of the researcher's knowledge, this study is considered the first to investigate the impact of using electronic teaching for self-learning and the cognitive and motor content of the skill of sending and receiving in volleyball.

METHODS

The study used a semi-experimental approach with equal groups (an experimental group and a control group) and conducted two tests (pre-test and post-test), which were suitable for the nature of the study.

Population and Sample of the Study

The study population consisted of female students in the first secondary grade, literary branch, at Jumana Secondary School for Girls in the Directorate of Education, Irbid, for the academic year 2022-23, totaling 150 students. The study sample was purposively selected from Jumana Secondary School for Girls in the Directorate of Education of Irbid. It consisted of 31 students, distributed into two groups. Table 1 presents the distribution of the study sample in the experimental and control groups.

Table 1. Distribution of the study sample.

Groups	No.
1 The experimental group used self-learning (electronic learning bag).	16
2 The control group used learning (the traditional way)	15
Total	31

Equivalence of the Two Study Groups

To assess the equivalence of the two study groups, the researcher randomly distributed the sample into control and experimental groups. Prior to the distribution, the groups were matched in terms of height, weight, physical abilities, and volleyball knowledge. Table 2 displays the equality of the sample members in the variables of height, weight, and physical abilities.

Table 2. Equality of respondents in the variables of height, weight, and physical abilities (n = 31).

Variants	Unit	Mean	S.D.	Coefficient Variation
Height	M	1.52	0.09	5.92
Weight	kg	62.37	13.30	21.21
Speed	m/s	1.50	0.30	2.00
Long jump	M	1.40	0.30	2.14
Vertical jump	M	0.18	0.09	5.00
Bend the torso from a squatting position	Once	21.70	8.5	39.17
Flexion of the torso from oblique supination	Once	11.01	6.04	36.69
Medicine ball throw	M	9.10	2.00	21.97

Table 2 displays the arithmetic means, standard deviations, and coefficients of difference for the height and weight variables, as well as the physical tests conducted on the entire study sample. Upon reviewing the coefficients of difference, it is evident that they fall within the acceptable range, which should not exceed 50%. Therefore, based on these values, the sample members can be considered equivalent in terms of these tests.

Table 3. Equality of members within each group in terms of height, weight, and physical abilities.

Variants	Unit	Experimental (N = 16)			Control (N = 15)		
		Mean	S.D.	Coefficient Variation	Mean	S.D.	Coefficient Variation
Height	M	1.50	0.09	6	1.54	0.09	5.84
Weight	kg	63.39	13.30	20.98	61.30	13.30	21.7
Speed	m/s	1.52	0.30	19.74	1.48	0.30	20.27
Long jump	M	1.38	0.30	21.74	1.42	0.30	21.13
Vertical jump	M	0.20	0.09	45	0.16	0.08	50.00
Bend the torso from a squatting position	Once	22.09	8.5	38.48	21.30	8.5	39.91
Flexion of the torso from oblique supination	Once	12.01	5.04	41.96	11.09	6.04	45.46

Table 3 presents the arithmetic means, standard deviations, and coefficients of difference for the variables of height and weight, as well as the physical tests (speed, long jump, vertical jump, trunk flexion, medicine ball throw) conducted on the experimental and control groups. Upon reviewing the coefficients of difference, it is evident that all values fall within the acceptable range, which should not exceed 50%. Therefore, based on these

values, the members of the experimental and control groups can be considered equivalent prior to commencing the experiment.

Study Tools

1. Restameter: Used to measure the height of the students (in cm).
2. Medical scale: Used to measure the weight of the students (in kg).
3. Stopwatch: Used to measure speed, which is characterized by the time taken to cover a certain distance (m/s).
4. Tape measure: Used to measure distances during the tests (in meters).
5. Volleyball court and equipment: Used to measure the skill of transmitting and receiving (degree).
6. Volleyball: Used by the students to perform the skill of sending and receiving.
7. Medicine ball: Used in the explosive strength test.
8. Laptops (Apple iPads): Used to display the program dedicated to the electronic educational bag for volleyball.
9. Registration form: Used to record data.
10. Cognitive tests: Developed based on previous studies (Jawarneh, 2017; Hussein, 2011), with the final form provided in Appendix No. 4.
11. Skill tests: Developed based on scientific references and input from specialists in the field, including tests for transmitting and receiving. The final forms of the tests can be found in Appendix No. 5 and Appendix No. 6.
12. Exploratory Study: Conducted to assess the appropriateness of the tests, organizational and administrative difficulties, safety of devices and tools, accessibility of devices and tools for students, contents of the electronic educational bag, scientific transactions for cognitive and skill tests, and the validity and stability of the tests.

Validity and Stability

Validity of the Content

The tests were presented to five experts who provided suggestions for modifications, which were incorporated into the final versions of the tests. Stability of the Tests: The test-retest method was employed to assess the stability of the physical ability tests. The tests were administered to a sample of ten students with a two-week interval, and the correlation coefficient between the test results was calculated. The results of this reliability analysis are presented in Table 4.

Table 4. Reliability of physical ability tests through test-retest method (n = 10)

Exams	Unit	First Application mean	S.D.	Second Application Mean	S.D.	Stability Value	Sign.
the speed	m/s	1.72	0.18	1.57	0.11	.89	0.002
Bend the torso from a squatting position	Once	9.00	6.01	12.14	4.89	.95	0.000
Bend the torso from the inclined prone position	Once	3.40	2.39	5.30	2.39	.98	0.032
Vertical jump	M	0.17	0.06	0.21	0.07	.91	0.035
long jump	M	0.95	0.20	1.01	0.24	.90	0.042
Medicine ball throw	M	10.00	1.40	10.81	1.35	.90	0.037

Table (4) indicates the stability of the physical ability tests through the test-retest method. The tests were administered to ten respondents, and the test was repeated after a two-week interval. The results showed a significant correlation coefficient ($\alpha \geq 0.01$), indicating the stability of these tests.

Table 5. Reliability of skill tests in volleyball using the test-retest method (n = 10).

Exams	Unit	First Application		Second Application		Stability Value	Sign.
		mean	S.D.	Mean	S.D.		
reception from below	degree of (30) m	3.70	1.87	4.10	1.10	.95	0.000
Transmit from bottom facing	Score out of (5) attempts	2.30	1.50	3.62	1.52	.88	0.004
Transmission from down my side	Score out of (5) attempts	0.90	0.64	1.62	1.22	.97	0.005

Table 5 presents the results of the skill tests in volleyball, including the first and second applications with a two-week time difference, for the exploratory sample of ten female students from the study community. Spearman's rank correlation coefficient was used to estimate the stability of these skill tests. The stability coefficients ranged from 0.88 to 0.97, and all of them were statistically significant, indicating the stability of the results obtained from these tests.

Regarding the cognitive test, the researcher used the Coeder and Richardson equation, which consisted of ten objective items with ten degrees. The stability value of this test on the survey sample was 0.78, which is considered appropriate and reflects the stability of the test.

The steps to apply the electronic educational bag are described in Appendix (2). It includes the key elements of the bag, the skill plan, educational materials and applications, and evaluation. The bag was applied for eight weeks, with two academic units specified each week and a duration of 45 minutes per unit, according to the school's class time.

Table 6. The distribution of the program content over the specified period.

Week	Unit	Program content
The first week - the second	4	The skill of sending from the bottom of the wave
Third-fourth week	4	The skill of sending the side down
Fifth-sixth week	4	The skill of receiving transmissions from below with the arms
Seventh-eighth week	4	Re-training on the skill of serving from below in both types (facing and lateral) and the skill of receiving transmissions from below with the arms.

1. The skill of sending from the bottom of the wave: This refers to the technique of sending or hitting the ball from the bottom of the wave, which is a common technique in volleyball.
2. The skill of sending the side down: This refers to the technique of sending or hitting the ball towards the side of the court, typically with a downward trajectory.
3. The skill of receiving transmissions from below with the arms: This refers to the technique of receiving or passing the ball using the arms, specifically when the ball is coming from below the player's position.
4. Re-training on the skill of serving from below in both types (facing and lateral) and the skill of receiving transmissions from below with the arms: This refers to the process of practicing and improving the skills of serving from below in different positions (facing and lateral) and the skills of receiving transmissions from below using the arms. It suggests that there is a need for additional training or refinement in these specific skills.

Table 7. A teaching model for the two methods of learning, the traditional method and self-learning, in the electronic educational bag for the skill of serving from the bottom of the confrontation in volleyball.

Teaching using the traditional method			Teaching using the electronic educational bag		
Lesson parts	time	Teaching method	Lesson parts	time	Teaching method
Lesson introduction	10 m	The school checks on the students.	Lesson introduction	10 m	The school checks on the students.
The educational part	10 m	The school knows the students' method used in teaching the skill of transmitting from the bottom of the face.	The educational part	10 m	The school knows the students' method used in teaching the skill of sending from the bottom of the face and dealing with the electronic educational bag.
Applied part	20 m	Warming up the students	Applied part	20 m	Warming up the students
Concluding part	5 m	The student learns the skill of transmitting from the bottom	Concluding part	5 m	The student learns the skill of serving from the bottom of the volleyball ball, according

of the wave, as shown by the school as follows:	to what the electronic educational bag shows as follows:
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Study Variables

This study is a quasi-experimental study using equal groups, and it included the following variables:

- Independent variables: The teaching method, which has two levels (the traditional method and electronic teaching).
- Dependent variables:
 1. The skill of serving in volleyball, with two levels: serving from below facing, serving from below side, and receiving from below with the arms.
 2. Knowledge content related to volleyball skills.

Statistical Procedures

The following statistical procedures were used in the study:

1. Frequencies were used to measure the number of times the volleyball was served from below, facing, or lateral.
2. The meter unit was used to measure the students' heights and some physical abilities such as jumping and ball-throwing distance.
3. The scale was used to estimate the weights of the female students in the survey sample.
4. Spearman's correlation coefficient was used to estimate the reliability of skill tests.
5. The Coeder and Richardson equation was used for the cognitive test.
6. The Wilcoxon test was used to examine differences in volleyball skills.
7. The cognitive content between the pre- and post-measurements was analyzed for both the experimental and control groups.
8. The Mann-Whitney test was used to assess differences between the experimental and control groups in volleyball skill and cognitive tests.

RESULTS

First Hypothesis

First, the results related to testing the first hypothesis are presented, which states: There are statistically significant differences at $\alpha \geq 0.01$ among the experimental group members in self-learning and its cognitive and motor content of the skill of sending and receiving in volleyball among female students between the pre- and post-measurements, favoring the post-measurements. The Wilcoxon test was used to verify this hypothesis, and the results are shown in Table 8.

Table 8. Results of the Wilcoxon test estimating the differences in volleyball skills and cognitive content between the pre- and post-measurements of the experimental group (n = 16).

Skills	Unit	Signal	Sum of ranks	No.	Mean	Z Value	Sign.
Reception from below	Degree of (30) m	negative	0.00	0	0.00	2.911	.004
		positive	55.00	10	5.50		
Transmitting from bottom facing	Score out of (5) attempts	negative	0.00	0	0.00	3.419	.001
		positive	91.00	13	7.00		
Transmitting from down my side	Score out of (5) attempts	negative	0.00	0	0.00	3.372	.001
		positive	105.00	14	7.50		
Cognitive test	score out of (10)	negative	0.00	0	0.00	3.540	.000
		positive	136.00	16	8.50		

Table 8 shows the results of the non-parametric Wilcoxon test for two correlated samples to investigate the differences between the pre- and post-applications of the volleyball skills tests and the cognitive content of these skills among the experimental group members. Moreover, by reviewing the value of the z-test's significance level, it reached (0.004) for the skill of receiving from below and (0.001) for the skill of transmitting from below, facing. It reached (0.001) for the skill of transmitting from below, sideways, and it reached (0.000) for the cognitive content of these skills. They were all statistically significant at the level of significance ($\alpha \geq 0.01$), indicating statistically significant differences between the pre- and post-measurements in volleyball skills and their cognitive content. Hence, the significance of these differences was in favor of the post-measurement, as the positive ranks and their numbers indicate this significance. Second: presenting the results related to testing the second hypothesis, which states: There are statistically significant differences at the level of significance ($\alpha \geq 0.01$) among the control group members in self-learning and its cognitive and motor content of the skill of sending and receiving in volleyball among female students between the pre- and post-measurements in favor of the post. To verify this hypothesis, and due to the small size of the sample, the non-parametric Wilcoxon test was used, as Table (9) shows. Table (9): Results of the Wilcoxon test to estimate the differences in volleyball skills and cognitive content between the pre-and post-measurements of the control group (n = 15)

Table 8 shows the results of the non-parametric Wilcoxon test for two correlated samples to investigate the differences between the pre- and post-applications of the volleyball skills tests and the cognitive content of these skills among the experimental group members. By reviewing the significance level of the z-test, it was found to be 0.004 for the skill of receiving from below, 0.001 for the skill of transmitting from below facing, 0.001 for the skill of transmitting from below sideways, and 0.000 for the cognitive content of these skills. All these values were statistically significant at the $\alpha \geq 0.01$ level, indicating significant differences between the pre- and post-measurements in volleyball skills and their cognitive content. These differences favored the post-measurement, as evidenced by the positive ranks and their numbers.

Second Hypothesis

Second, the results related to testing the second hypothesis are presented, which states: There are statistically significant differences at the $\alpha \geq 0.01$ level among the control group members in self-learning and its cognitive and motor content of the skill of sending and receiving in volleyball among female students between the pre- and post-measurements, favoring the post-measurements. To verify this hypothesis, the non-parametric Wilcoxon test was used due to the small size of the sample. Table 9 shows the results of this test.

Table 9. Results of the Wilcoxon test estimating the differences in volleyball skills and cognitive content between the pre- and post-measurements of the control group (n = 15).

Skills	Unit	Signal	Sum of ranks	No.	mean	Z value	Sign.
reception from below	degree of (30) m	negative	0.00	0	0.00	2.236	0.025
		positive	15.00	3	5.00		
Transmit from bottom facing	Score out of (5) attempts	negative	0.00	0	0.00	1.725	0.084
		positive	30.00	7	4.29		
Transmitting from down my side	Score out of (5) attempts	negative	0.00	0	0.00	1.342	0.180
		positive	3.00	2	1.50		
Cognitive test	score out of (10)	negative	6.00	1	6.00	3.415	0.001
		positive	120.00	15	8.00		

Table 9 presents the results of the non-parametric Wilcoxon test conducted on the control group to examine the differences in volleyball skill tests and the cognitive content of these skills between the pre- and post-measurements. The significance levels (represented by the z-test values) were found to be 0.025 for the skill of receiving from below, 0.084 for the skill of sending from the bottom facing, 0.180 for the skill of sending from the bottom side, and 0.001 for the cognitive content of these skills.

When comparing these significance levels with the predetermined threshold ($\alpha \geq 0.01$), it was observed that the skill tests had the least significant differences. This indicates the presence of statistically significant differences between the pre- and post-measurements in volleyball skills. Additionally, the significance level for the knowledge content of volleyball skills was lower than $\alpha \geq 0.01$, indicating statistically significant differences in favor of the post-application among the control group members.

It is important to note that the significance of the differences in volleyball skill tests and the cognitive content of these skills between the pre- and post-measurements among the control group members was statistically significant at $\alpha \geq 0.01$ for the receiving skill from below, the skill of transmitting from below facing, and sending from below side.

Third Hypothesis

Moving on to the third hypothesis, it states that there are statistically significant differences at the level of significance ($\alpha \geq 0.01$) between the experimental and control groups in self-learning and the cognitive and motor content of the skill of sending and receiving in volleyball for female students in the post-test, favoring the experimental group.

Table 10. The differences between the two groups in the skill and cognitive tests in volleyball using the Mann-Whitney post-measurement test.

Skills	Unit	Group	Sum of Ranks	No.	Mean	Z Value	Sign.	ETA box
Reception below	from degree of (30) m	Experimental	327.00	16	20.44	3.423	.001	0.076
		Control Group	169.00	15	11.27			
Transmit bottom facing	from Score out of (5) attempts	Experimental	327.50	16	20.47	3.132	.002	0.074
		Control	168.50	15	11.23			
Transmitting down my side	from Score out of (5) attempts	Experimental	356.00	16	22.25	4.383	.000	0.082
		Control	140.00	15	9.33			
Cognitive test	score out of (10)	Experimental	313.50	16	19.59	2.306	.021	0.065
		Control	182.50	15	12.17			

Table 10 presents the results of the non-parametric Mann-Whitney test conducted on two independent samples: the experimental and control groups. The purpose was to examine the differences in volleyball skill tests and the cognitive content of these skills in the post-measurement. The significance levels were found to be 0.000 for the skill of transmitting from the bottom facing, 0.021 for the skill of transmitting from the bottom side, and the significance level for the cognitive content of these skills was higher than $\alpha \geq 0.01$.

When comparing these significance levels with the predetermined threshold ($\alpha \geq 0.01$), it was observed that the skill tests (receiving from below, transmitting from below-facing, transmitting from below sideways) had values lower than the significance level. This indicates statistically significant differences between the experimental and control groups in these skills in the post-measurement, favoring the students of the experimental group. However, no statistically significant differences were found in the cognitive content between the two groups in the post-measurement.

DISCUSSION

This section discusses the results in light of the study hypotheses:

First Hypothesis

The results indicate statistically significant differences at $\alpha \geq 0.01$ among the experimental group members in self-learning and the cognitive and motor content of the skill of sending and receiving in volleyball between the pre- and post-measurements, favoring the post-measurement. Table 8 shows that all statistical values related to skilled performance in volleyball among the experimental group members were significant at the $\alpha \geq 0.01$ level. This suggests that the electronic educational bag, with its theoretical and practical content, contributed to improving the skilled performance in volleyball. The researcher attributes this result to the characteristics and attributes of the electronic educational bag, such as training videos, organized information, animated illustrations, and the ability for students to refer back to the content when needed. The researcher also highlights the interactive nature of the educational bag, the continuous evaluation, and the provision of positive feedback, which enhance the learning process. These findings align with previous studies conducted by Ahmed et al. (2009), Hussein (2011), Jawarneh (2017), and Wilkinson and Heller (1999), which demonstrated the

effectiveness of educational bags and computerized software in improving learning outcomes and performance in volleyball skills.

Second Hypothesis

There are statistically significant differences at $\alpha \geq 0.01$ among the control group members in self-learning and the cognitive and motor content of the skill of sending and receiving in volleyball among female students between the pre- and post-measurements, favoring the post-measurement. Based on the results presented in Table 9, it was observed that all values related to volleyball skills were not statistically significant, except for the cognitive content. The cognitive content showed improvement between the pre- and post-measurements, favoring the post-measurement at the $\alpha \geq 0.01$ level among the control group members. The researcher attributes this result to the positive impact of educational programs on the cognitive content. The teacher implemented the educational program, which had the same content as the electronic educational bag but differed in the method of implementation. The teacher was able to communicate information about volleyball skills, contributing to the improvement of the control group's cognitive content related to volleyball.

These findings align with previous studies conducted by Ahmed et al. (2009), which showed that the control group made progress in learning the technical performance and accuracy of the forward-facing skill, although less than what was achieved by the experimental group. Similarly, Hussein (2011) demonstrated that the regular (traditional) program positively contributed to learning some types of volleyball transmission skills among the control group members between the pre- and post-measurements, favoring the post-measurement. Additionally, Jawarneh (2017) found that traditional learning significantly impacted learning some volleyball skills and their cognitive content among the control group members between the pre- and post-measurements, favoring the post-measurement.

Third Hypothesis

Discussing the third hypothesis: There are statistically significant differences at the $\alpha \geq 0.01$ level between the members of the experimental and control groups in self-learning and the cognitive and motor content of the skill of sending and receiving in volleyball for female students in the post-test, favoring the experimental group.

Table 10 provides statistical results comparing the members of the experimental and control groups of female students. It was found that there was statistical significance for the skill of receiving from below and the skill of transmitting from below, both facing and laterally, at the $\alpha \geq 0.01$ level, favoring the experimental group members. The researcher attributes this result to the contents of the electronic educational bag and its implementation method. In the learning environment, computers were equipped, and the educational bag was added to facilitate access to information about the skills. The bag presented each skill with its knowledge and application content, allowing students to refer to it easily when needed, with information sequenced from easy to complex. In contrast, the control group, with the regular program, faced limitations in accessing information due to a single teacher teaching volleyball skill to a large number of students. This resulted in limited time for individual attention and the inability to repeat information outside of lesson time. As a result, the experimental group outperformed the control group.

This study is in agreement with Hussein (2011), who conducted a post-measurement comparison between the experimental and control groups. It also supports the findings of Nouri (2013), which demonstrated the effectiveness of using the intensive and distributed method in conjunction with the educational bag. The alternatives and stimuli presented by the bag provided learners with crucial feedback, and the distributed method used by the second group resulted in better performance accuracy compared to the other method used by the first group. Furthermore, it aligns with the results of Difficulties (2015), which revealed the effectiveness of computerized physical education lessons in developing the skill level of fifth-grade students in volleyball and ground gymnastics. The study by Alhayak (2003) also supported the effectiveness of the experimental group, showing statistically significant differences in their favor. Additionally, the findings of Reis et al. (2010) indicated that the use of computer simulations for optimal performance in breaststroke swimming effectively improved swimmers' performance in 100- and 200-meter competitions.

In conclusion, based on the results of this study, the researcher concluded that teaching using the traditional method provided students with some volleyball skills, while teaching using the electronic educational bag resulted in greater and statistically significant improvement in volleyball skills.

RECOMMENDATIONS

Based on the objectives and findings of the study, the researcher recommends the active implementation of e-learning systems in teaching physical education. It is also recommended to organize workshops for physical education teachers to familiarize them with e-learning methods and highlight its significance in teaching and developing various sports skills, including volleyball. Furthermore, the use of the developed electronic educational bag from this study is recommended to enhance students' skills in sending and receiving volleyball and improve their knowledge content related to these skills.

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APPENDIX

Self-Learning Method (Electronic Learning Bag)	Learning Style In The Traditional Way
Introduction to the educational package for the skill of sending and receiving and its objectives (directions and instructions given to the student in the approved program guide) Pre-tests for the skills of sending and receiving are under study. Identifying the behavioral goals in order to achieve the student's educational goal by using the electronic educational bag	Introduction to using the approved book for the skill of sending and receiving and its objectives. Identifying behavioral goals in order to achieve the student's educational goal using traditional learning Behavioral objectives of the skill.

Components of the Electronic Educational Bag

The electronic educational bag is designed for female students in the first secondary grade, literary branch, at Jumana Secondary School for Girls, who are learning the skills of sending and receiving in volleyball. It focuses on three specific skills: sending from below the face, sending from below on the side, and receiving the transmission from below with the arms. The duration of the bag is 45 minutes, which includes both educational and applied parts for the skill.

1. Skill of Serving from Below in Volleyball: This component consists of four educational units aimed at teaching and developing the skill of serving from below in volleyball.
2. Skill of Sending from the Bottom Side in Volleyball: This component consists of four educational units focused on teaching and developing the skill of sending from the bottom side in volleyball.
3. Skill of Receiving from Below with the Arms in Volleyball: This component consists of four academic units aimed at teaching and developing the skill of receiving from below with the arms in volleyball.

The General Objective of the Electronic Educational Bag: The general objective of the bag is to help students learn how to access information and apply it independently. It aims to develop the students' knowledge, skills, and legal abilities in sending and receiving in volleyball.

The Main Objectives of the Electronic Educational Bag:

1. Acquiring cognitive information through the skills of transmitting and receiving in volleyball.
2. Acquiring legal knowledge about sending and receiving in volleyball.
3. Performing the skill of transmitting and receiving using different electronic alternatives such as sound, moving pictures, competitions, and live models.
4. Applying the skills of sending and receiving in volleyball.
5. Understanding the practical applications of sending and receiving in volleyball through the electronic educational bag.

Components of the Traditional Method:

The traditional method consists of the following components for teaching the skill of sending and receiving in volleyball:

1. Volleyball Teacher: The program involves a volleyball teacher who teaches the skill of sending and receiving. The teacher is responsible for delivering the educational part (teaching) and the applied part (exercises) for the skill.
2. The Skill of Transmitting from Below Side: This component consists of four educational units focused on teaching and developing the skill of transmitting from below facing in volleyball.
3. Skill of Transmitting from the Bottom Side: This component consists of four educational units aimed at teaching and developing the skill of transmitting from the bottom side in volleyball.
4. Skill of Receiving Transmissions from Below with the Arms: This component consists of four educational units focused on teaching and developing the skill of receiving transmissions from below with the arms in volleyball.

The Overall Goal of the Traditional Method: The overall goal of the traditional method is for students to learn information about the skill of sending and receiving in volleyball from the teacher and apply it effectively. It aims to develop the students' knowledge, skills, and legal abilities in sending and receiving in volleyball.

The Main Objectives of the Traditional Method:

1. Acquiring cognitive information through the skills of sending and receiving in volleyball.
2. Acquiring legal knowledge and information related to the skill of sending and receiving in volleyball.
3. Applying the skills of sending and receiving in volleyball.

Test	The aim of the measurement
The speed is stable	Speed Test: Objective: To measure speed. Test Execution: The student starts from a standing position on the starting line and runs as fast as possible to the finish line. Rules: <ol style="list-style-type: none"> 1. The student must stand on the starting line. 2. The female student should wait for the whistle before starting. 3. The student should cross the finish line to complete the test. Measurement: The distance covered in the shortest amount of time.
long jump	Long Jump Test - Hang Technique: Objective: To measure the explosive strength of two individuals. Test Execution: The student runs and jumps forward from the board to the jumping pit using the hang technique. The distance is measured from the initial landing point of the feet without any part of the body touching the ground. Rules: <ol style="list-style-type: none"> 1. The student performs the jump from a running motion, and the signal is placed at the maximum distance reached. 2. The student jumps with one foot from the board without touching the foot to the clay board. 3. The student should exit the jumping pit after completing the jump. Recording Method: The longest distance reached by the student is measured to the nearest centimeter.
Vertical jump	Jumping up from standing still. Vertical Jump Test: Objective: To measure the explosive force of the feet. Test Execution: The student marks a spot on the board with chalk while standing with the right hand raised high. The distance from the mark to the feet (first distance) is measured. Then, the student bends the knees and jumps vertically with the right arm raised high, and a mark is made at the maximum height reached (second distance). The result is calculated by subtracting the second distance from the first distance. Rules: <ol style="list-style-type: none"> 1. The student should stand in front of the board with chalk in hand, raise the arm high, and make a mark without jumping. 2. The student must bend the knees before the vertical jump. Recording Method: The highest height reached by the student is measured to the nearest centimeter.
Bend the torso from a squatting position	Trunk Muscle Strength Test - Flexion and Extension (30 seconds): Objective: To measure the strength of the torso over a specific period of time. Test Execution: The student assumes a squatting position and performs trunk flexion and extension movements according to the referee's signal for 30 seconds. In each repetition, the student must touch the chest with the knees for the attempt to be considered correct. Rules: <ol style="list-style-type: none"> 1. The student must follow the start signal. 2. The chest should touch the knees. Recording: The student repeats the attempt twice with a three-minute rest in between, and the best attempt is determined by the number of correct repetitions. Trunk Muscle Strength Test - Flexion and Extension (30 seconds):

Test Objective: To measure the strength of the torso over a specified period of time. Test Execution: The student assumes the inclined prone position and performs trunk flexion and extension movements according to the referee's signal for 30 seconds. In each repetition, the student must make the chest touch the ground for the attempt to be considered valid. Rules:

1. The student must follow the start signal.
2. The chest should touch the ground.
3. Incorrect attempts are not counted.

Recording: The student repeats the attempt twice with a three-minute rest in between, and the best attempt is determined by the number of valid repetitions.

Trunk muscle strength test type flexion and extension of the trunk for (30) seconds.

Trunk Muscle Strength Test - Flexion and Extension (30 seconds):

Test Objective: To measure the strength of the torso over a specified period of time. Test Execution: The student assumes the inclined prone position and performs trunk flexion and extension movements according to the referee's signal for 30 seconds. In each repetition, the student must make the chest touch the ground for the attempt to be considered valid. Rules:

1. The student must abide by the start signal.
2. The chest should touch the ground.
3. Incorrect attempts do not count towards the final result. Recording: The student repeats the attempt twice after a three-minute rest, and the best attempt is determined based on the number of valid repetitions.

The Explosive Power of the Arms: Throwing the Medicine Ball

Test Objective: To measure the explosive force of the arms.

Implementation of the Test: The student stands on the starting line and catches the medicine ball, then performs the process of throwing the ball as far as possible while following the rules and instructions.

Rules:

1. The student must stand on the starting line.
2. The medicine ball should be held correctly and thrown over the head.
3. The student must remain in place without attempting to jump or step forward.

Registration: Each student is given three attempts, and the best attempt is determined using the scale (M).

Cognitive Tests

Cognitive Test for the Skill of Transmitting from Below (Facing, Lateral) and Receiving Transmissions from Below with the Arms.

The test consists of ten questions, five of which are related to the cognitive aspects of the skill of sending from below (facing, lateral), and five are related to the cognitive aspects of receiving transmissions from below with the arms.

Choose the correct statement:

1. The serve is considered an offensive skill because it announces the start of the game.
2. The serve is an offensive skill that does not announce the start of the game.
3. The serve is considered a defensive skill with which he announces the start of the game.

Choose the correct statement:

4. A: The service is used from below (facing or sideways) for the higher levels. B: Serves from the bottom of the front and sides are for beginners. C: The service is used only from the bottom of the front and from the side for women.

Choose the correct statement:

5. A: After hitting the served ball, the player remains standing in her place. B: After hitting the served ball, the player continues. C: After hitting the served ball, the player moves to the front position.

Choose the correct statement:

6. A: The movement of the hand hitting the serve from below (facing sideways) is characterized by a lack of continuity in following the ball, which is a common mistake. B: The movement of the feet pointing forward along the back line in the service from below (facing sideways) is a common mistake. C: Balance when bending the knees is a common mistake.

Choose the correct statement:

7. A: Hitting the ball by serving from below (facing sideways) is from the bottom side of the ball. B: Hitting the ball in the service from below (facing sideways) is from the upper side of the ball. C: Hitting the ball in the service from below (facing, lateral) is from the side of the ball.

Choose the correct statement:

8. A: After the player receives the ball from below with her arms, she remains standing in her place, standing completely. B: After the player receives the ball from below with her arms, she follows it up. C: She moves to the front position after the player receives the ball from below.

Choose the correct statement:

9. A: After the player receives the ball from below with the arms, he directs it to the stomach. B: After the player receives the ball from below with her arms, she directs it out of the field. C: After the player receives the ball from below with her arms, she directs it to the net.

Choose the correct statement:

10. A: In receiving the serve from below with the arms, the ball is behind the player. B: In receiving the serve from below with the arms, the ball is beside the player. C: In receiving the serve from below with the arms, the ball is in front of the player.

Appendix (6) - Legal Cognitive Tests

The student should put a sign (/) in front of the correct statement and a sign (x) in front of the wrong one:

1. The player performs the serve from the specified area; the width of the volleyball court is 9 m.
2. The player must execute the serve within 3 seconds.
3. The player who executes the serve occupies position 6 (/).
4. The player must hit the served ball with both hands.
5. The player can blow the referee's whistle (/) before.
6. The serve is considered valid if the serving ball is inside the opponent's court.
7. The player receiving the ball from below with her arms may move in the field without being restricted to the position specified for her before receiving the ball from the opponent.