

# The Effect of Learning Program Using a Smartphone on Improving Performance of some Handball Basic Skills

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**Abstract:** In this study we looked for an effect of learning program using Smartphone on improving pass and shoot handball skills performance for students of Sports Science faculty at Mutah University using experimental method by applying a random sample consist of (60) students were divided into two groups :control(n=30) and experimental(n=30), a pre and post tests on pass and shoot tests were applied to both groups before and after applying the experimental group content of a Smartphone learning program (8 weeks, 2 learning units/week, 50 minutes /unit) On the other hand control group applied traditional learning content provided by handball teacher (8 weeks, 2 learning units/week, 50 minutes /unit). To verify the study hypotheses, a comparison between the pre and post measurements was made using T statistical analysis. the results showed statistically significant superiority of the experimental group compared to the control, the study recommended the necessity of using the learning program using a Smartphone on improving pass and shoot handball skills performance for students of Sports Science faculty at Mutah University.

**Keywords:** educational technology, Smartphone, learning; handball skills.

## 1 Introduction

Modern trends in the field of education depend on the subjectivity of learners to obtain the experience that the educational situation provides for them, and to transfer the focus of attention from the teacher to the learner; Therefore, teachers must follow different teaching methods to achieve the goal of the educational process; Because the success of the educational method depends on several factors, including: the content of the educational material to be taught, the capabilities of the learners, and it is necessary for the learners to have several options in the methods used in the educational process so as not to stop at only one method.

Teaching is a series of relationships that arise between the teacher and the student, and the aim is to develop their levels, as the teaching methods have evolved and varied and made teachers use more than one teaching method to transfer knowledge (theory and skill) to learners and allow teachers to move from one method to another according to the educational situation and the capabilities of the learners [1].

It has become mandatory for various academic institutions that seek academic excellence to keep pace with the revolution brought by smart devices in the teaching methods used in learning to raise their scientific and educational status.

Smart devices facilitated the teaching and learning processes in relation to the methods of the educational process, as it facilitated interaction and communication outside the classroom, due to the presence of study courses on smart devices through a specific application that connects them to each other in various situations, which achieved pleasure and benefit for them and created an educational learning environment within a new framework [2].

The use of smart devices in the educational process increases the number of students participating in the educational process and lowers the costs of education compared to traditional methods of education [3]. [4]. also indicated that learning with smart devices; It works to provide an educational environment that helps the learner build their learning experiences by helping them how to use all sources of knowledge. Learning using smart devices is characterized by a set of features and characteristics that [5]. indicated that learning takes place from every time and place, and allows the learner to communicate permanently quickly, and at a low financial cost compared to other methods of communication, and one of the most important. characteristics of smart devices is their small size, which makes it easy to carry and transfer it with the learner permanently. [6]. indicates that the use of smart devices in teaching positively affects the

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teaching and learning of students for all academic courses in general, and physical education in particular, and makes them more interesting and attractive. [7]. defined learning with smart devices as learning at anytime and anywhere easily and quickly through the use of mobile devices that are easy to use, carry and connect to wireless networks. [8]. indicates that learning using smart devices is a new form of distance learning, in which the learner is separated from the teacher in location and time. This was confirmed by [9]. that smart devices represent educational tools that connect the teacher with the learners at any time and place without cost and effort.

Teaching motor activities and basic skills for any game in physical education and reaching educational goals requires sufficient scientific knowledge of modern educational methods, which help the learner to learn the correct and new skills, make him an essential focus in the educational process [10].

The game of handball is one of the aspects of competitive sports activities and it requires the application of modern and advanced scientific methods to achieve its goals in order to reach the learners to a degree that they can then perform properly, according to [11]. Teaching basic principles is the most difficult stage, but it is necessary to raise the level and rise towards proficiency.

The researchers believe that it is necessary to pay attention to educational technologies and their applications in the educational process until it reaches a level that is sufficient for compatibility and harmony with the course of the times.

Handball is one of the important and main courses in the undergraduate plan, which has been affected by the change and rapid development witnessed by the educational and educational process in the faculties of physical education, so it became mandatory for us to develop the teaching of the content of this course from a technological point of view using various educational techniques. Despite the importance of this course for students at the College of Sports Sciences, its skills face difficulty in teaching them, due to the fact that most students do not practice this sport before entering the college. Therefore, it is necessary to use modern educational techniques commensurate with the nature of this course, which requires a lot of effort and care when starting to teach its skills.

The importance of this study is demonstrated by building and implementing a program using smartphone technology, the preparation of which was supervised by specialists in the field of physical education and e-learning in a manner that may contribute to spreading the game, and those interested in the game of handball can follow its news, programs, and everything related to it through Smartphone technology, and the segment of students at the College of Sports in universities is considered one of those searching for the information provided on these technologies, or quick and easy applications, and it will contribute to shedding light on how to benefit from the phones we carry in our hands in creating a qualitative shift in the field of learning, instead of limiting their use to Send and receive phone calls only.

### **1.1 The Problem**

Through the researcher's follow-up to the lectures of handball courses at the College of Sports Sciences at Mutah University, the researchers noticed the difficulty of students learning the basic skills in handball, and by referring to the teaching method followed by the course teachers, the researchers found that most teachers use only the traditional method in the educational process, which depends On the teacher explaining the educational aspects of skills, giving a model and then the students doing the application, and the learners depend on the teacher only, and this method does not take into account the individual differences between the learners and does not give the learners freedom to learn according to their abilities and efficiency, therefore the current study came to experiment a teaching method the student is the center of learning according his abilities, gives a clearer and closer perception of reality in the models presented for the skills to be learned, which leads to building a correct perception of the skill among learners.

As a result of a review of the previous literature in the field of teaching methods used in the field of teaching various sports skills such as Al-Kilani [12]. which used three methods in teaching the basic skills of handball and swimming and used the method (command, reciprocal, and subjective) and Sha'lan et al. [13]. which dealt with the use of multimedia software using the computer to teach some basic skills in Table tennis game, but these studies did not examine the effect of smart devices in teaching handball skills, which prompted the researchers to know the effect of using the smartphone on teaching basic skills in handball.

### **1.2 Objectives of the study:**

1. The effect of the traditional educational program on the level of performance of some basic skills in handball among the members of the control group
2. The effect of a proposed educational program using the smartphone on the level of performance of some basic skills in handball for the experimental group
3. A comparison between the proposed educational program using the smartphone and the traditional educational program on the level of performance of some basic skills in handball.

### 1.3 Study hypotheses:

1. There are statistically significant differences at the level ( $\alpha \leq 0.05$ ) between pre and post measurements in the level of performance on some basic skills in handball (passing on the wall, passing from running, shooting) among the members of the control group in favor of the post measurement.
2. There are statistically significant differences at the level ( $\alpha \leq 0.05$ ) between pre and post measurements in the level of performance on some basic skills in handball (passing on the wall, passing from running, shooting) among the members of the experimental group in favor of the post measurement.
3. There are statistically significant differences at the level ( $\alpha \leq 0.05$ ) in the post measurement between the members of the control and experimental groups in the level of performance of some basic skills (passing on the wall, passing from running, shooting) in handball in favor of the experimental group.

## 2 Methodologies

### 2.1 Study Approach

The researchers used the experimental method with a dual design using the experimental and control groups and by comparing between the pre and post measurement.

### 2.2 Study population:

The study population consisted of (140) students in the Faculty of Sports Sciences, the level of the first academic year, the academic year 2022.

**2.3 Study sample:** (60) students were randomly selected from the study population, the study sample was randomly selected from the study population, they were divided into two groups:

The experimental group: consisted of (30) students who learn through the use of a smartphone. The program was applied for a period of eight weeks, two sessions per week, 50 minutes per session.

The control group: consisted of (30) students who learned using the traditional method for a period of eight weeks two sessions per week, 50 minutes per session.

In order to verify the equivalence of both the experimental and control groups, to verify that the improvement in the study variables is due to the method of learning using the smartphone (the independent variable), a set of tests were applied, represented by: passing on the wall, passing from running, shooting, in addition to verify the equivalence of two groups (experimental) and (control) in each of height, weight, age. To verify this, T test was used to detect the presence of statistically significant differences between the two groups in the premeasurement, which is shown in Table No. (1):

**Table 1:** T-test for independent samples to examine the differences between the members of the experimental groups (n = 30) and the control group (n = 30) in age, height, weight, passing on the wall, passing from running, shooting.

variable	group	Mean	Std. Deviation	T	DF	P
Age	experimental	20.400	0.498	1.891	58	.064
	control	20.100	0.712			
height	experimental	172.500	2.374	-.865	58	.390
	control	173.100	2.964			
weight	experimental	64.500	3.998	-.355	58	.724
	control	64.900	4.006			
passing on the wall	experimental	7.600	1.221	-.290	58	.773
	control	7.700	1.442			
passing from running	experimental	6.600	1.831	-.352	58	.726
	control	6.800	1.832			
shooting	experimental	7.300	1.512	.508	58	.614
	control	7.100	1.539			

- Statistically significant at the level ( $\alpha \leq 0.05$ )

Table (1) indicates that there are no statistically significant differences between the control and experimental groups according to height, weight, age and study variables, which is evidence of the equality of the two groups in these variables before starting the application of the program.

## 2.4 The pilot study:

The researchers conducted a pilot study on (10) students from the College of Sports Sciences and from outside the study sample. This experiment was applied for a week, with two sessions to identify problems and errors that could occur during the application process of the program. The pilot study is considered an opportunity for the researchers to practice applying the proposed educational program using Smartphone and study tests.

## 2.5 The proposed educational program using mobile phone:

To achieve the objectives of the study, the researchers used the smartphone to teach some basic skills in the game of handball. The researchers used the following programs to prepare the educational program:

(Microsoft word XP, Premiere pro (15), Word press, Pwa, PHA, Paint), The proposed educational program was implemented in two sessions of 50 minutes each for eight weeks. To prepare the proposed educational program using the smartphone, the researchers did the following:

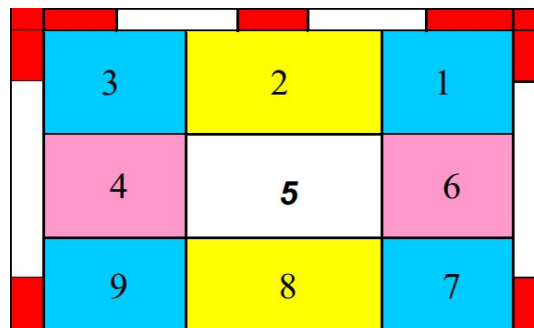
1. The researcher reviewed the previous literature related to the subject of the study [14, 15, 16].
2. Preparing the proposed educational content for the skills under study by dividing each skill into a set of steps so that a step contains information about the educational aspects of the skill and these steps are linked to each other.
3. Presenting the content of the proposed educational program to a group of arbitrators holding a doctorate degree in physical education to express their opinion on the educational program and its suitability and the objectives and sample of the study and to make any modification, addition or deletion before creating the program on the smartphone.
4. The tutorial is designed on the smartphone.
5. Presenting the educational program designed on the smartphone to a group of PhD holders in the field of educational technology and teaching methods in physical education.
6. Making adjustments according to the opinions of experts and arbitrators, then trying the educational program using the smartphone on a pilot sample for a week.
7. Amending the proposed educational program using the smartphone and removing it permanently to start implementing the study on the study sample.
8. As for the tests used in the study to measure the level of skill performance in the game of handball, the tests that correspond to the skills under study were limited by referring to the scientific references that specialize in measurement in handball [14, 17].

## 2.6 Testing the shooting skill accuracy

**Purpose of the test:** measurement of shooting skill accuracy

**Tools:** Handball -Throw Line - Divided Goal

**Performance method:** A Handball thrower divides the goal to measure the accuracy of shooting into nine rectangles and draws a line on the ground 9 m away from this figure, the player scores from behind the line with a pivot step, taking into account that the one who hits the ball (1,3,7 or 9) and its distance (1 M \* 60 cm), gets 3 degrees, which represents the four angles of the goal. Whoever hits the rectangular ball 6 or 4, gets 2 degrees, which its dimensions are (1 m \* 80 cm), and whoever hits the rectangular ball No. (2,5 or 8), gets 1 degree, whose dimensions are (1 m \* 80 cm). Whoever hits the ball and does not score at any goal inside the corners of the goal gets zero, each player has 10 attempts.



**Fig. 1:** Testing the shooting skill accuracy.

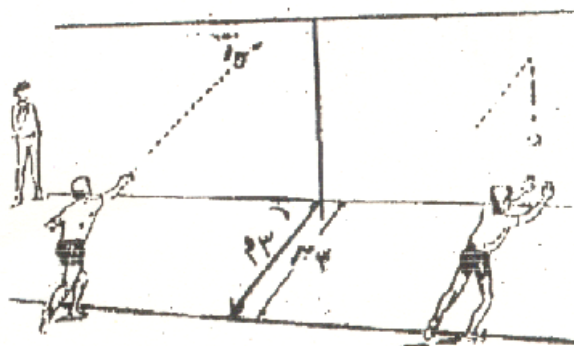
**Passing and Receiving Test Against a Wall for 30 seconds**

**Test Purpose:** Measure coordination and passing speed.

**Tools Used:** Regulation handball, wall, stopwatch.

**Procedure:** The participant stands 3 meters away from the wall and performs passes against the wall, receiving the ball and continuing to pass and receive as many times as possible within 30 seconds.

**Measurement Method:** Count the number of passes and receptions. The participant performs the test using their dominant hand.



**Fig. 2:** test Passing and Receiving Test Against a Wall for 30 seconds

**2.7 Tests Validity:**

By reviewing the scientific references and previous studies that used these tests [14, 17].

**2.8 Test reliability:**

The method of test retest was used by a sample from outside the study population, which numbered (16) the results of the Pearson correlation coefficient were as shown in Table (2).

**Table 2:** Pearson correlation coefficient between test and re-test on a sample (n = 16) for the study tests

Tests		Mean	Std. Deviation	Pearson correlation	P
passing on the wall	test	7.813	1.223	0.961	0.000*
	Re-test	7.938	1.237		
passing from running	test	7.063	2.112	0.933	0.000*
	Re-test	7.313	2.120		
shooting	test	7.563	1.711	0.899	0.000*
	Re-test	7.375	1.586		

- Statistically significant at the level ( $\alpha \leq 0.05$ )

It is evident from Table (2) that there is a statistically significant correlation between test and re-test to each of the study skills tests, which is evidence of the reliability.

**2.9 Description of the actual application stage of the proposed program:**

The actual application period of the proposed program lasted for eight weeks, with two units per week. The duration of each educational unit is fifty minutes. Thus, the number of educational units for each group is (16) educational units.

The educational unit of the proposed program included three parts: The introductory part: contains the general and specific warm-up of the educational unit.

The main part: It contains the technical aspects of the skill, and then it moves to the applied aspects of the skill. The final part: contains calming exercises.

**3 Results**

**3.1 To answer the first hypothesis, which states:**

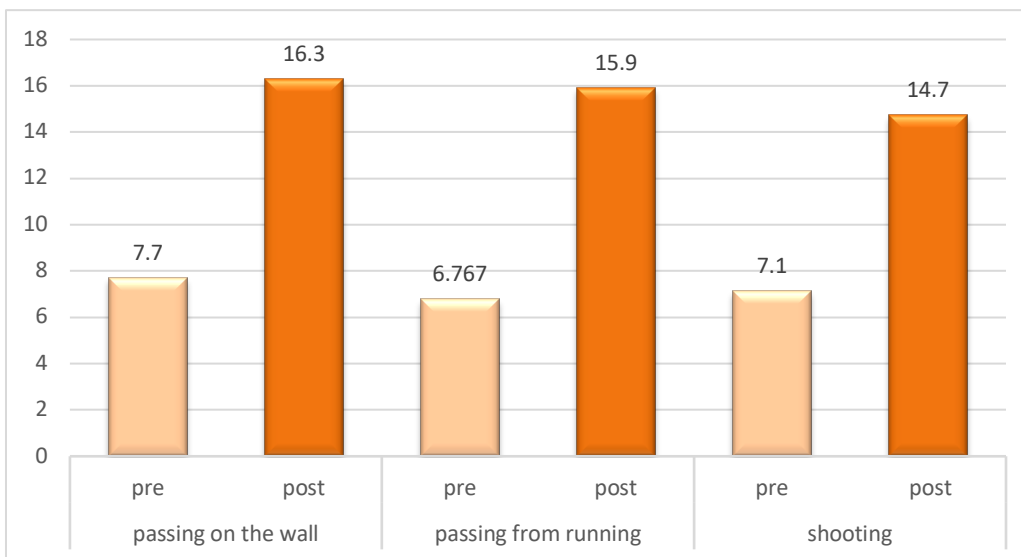
There are statistically significant differences at the level ( $\alpha \leq 0.05$ ) between pre and post measurements in the level of performance on some basic skills in handball (passing on the wall, passing from running, shooting) among the members of the control group in favor of the post measurement.

To test this hypothesis, a paired sample T-Test was used to examine the differences between the pre and post applications, and Table No. (3) shows the results of that.

**Table 3:** Paired sample T-Test to examine the differences in the performance of the members of the control group in the pre and post applications of the research variables (n = 30).

variable	applications	Mean	Std. Deviation	T	P
passing on the wall	pre	7.700	1.442	-26.562	.000*
	post	16.300	1.119		
passing from running	pre	6.767	1.832	-13.581	.000*
	post	15.900	2.670		
shooting	pre	7.100	1.539	-19.423	.000*
	post	14.700	1.643		

- Statistically significant at the level ( $\alpha \leq 0.05$ )



**Fig. 3:** Differences in the performance of the control group members in the pre and post applications

The data in Table (3) and Figure (3) show that there are statistically significant differences at the level of significance ( $\alpha \leq 0.05$ ) in terms of the value of (T) and the level of significance accompanying it in the level of performance of the members of the control group for (passing on the wall, passing from running, shooting)

Referring to the averages, it appears that the average performance in the pre application exceeds the post application, which enhances the effectiveness of the traditional program.

### 3.2 To answer the second hypothesis, which states:

There are statistically significant differences at the level ( $\alpha \leq 0.05$ ) between pre and post measurements in the level of performance on some basic skills in handball (passing on the wall, passing from running, shooting) among the members of the experimental group in favor of the post measurement.

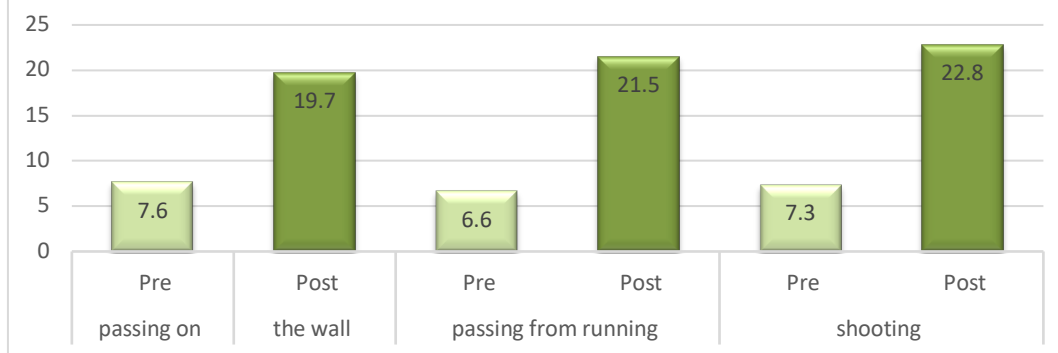
To test this hypothesis, a paired sample T-Test was used to examine the differences between the pre and post applications, and Table No. (4) shows the results of that.

**Table 4:** Paired sample T-Test to examine the differences in the performance of the members of the experimental group in the pre and post applications of the research variables (n = 30).

Variable	Applications	Mean	Std. Deviation	T	P
passing on the wall	Pre	7.600	1.221	-45.072	.000*
	Post	19.700	1.208		
passing from running	Pre	6.600	1.831	-21.226	.000*
	Post	21.500	3.256		
shooting	Pre	7.300	1.512	-32.866	.000*
	Post	22.800	2.074		

- Statistically significant at the level ( $\alpha \leq 0.05$ )





**Fig. 4:** Differences in the performance of the experimental group members in the pre and post applications

The data in Table (4) and Figure (2) shows that there are statistically significant differences at the level of significance ( $\alpha \leq 0.05$ ) in terms of the value of (T) and the level of significance accompanying it in the performance level of the experimental group members for (passing on the wall, passing from running, shooting)

Referring to the means, it appears that the average performance in the pre application exceeds the post application, which enhances the effectiveness of the proposed educational program using the smartphone.

**3.3 To answer the third hypothesis, which states:**

There are statistically significant differences at the level ( $\alpha \leq 0.05$ ) in the post measurement between the members of the control and experimental groups in the level of performance of some basic skills (passing on the wall, passing from running, shooting) in handball in favor of the experimental group.

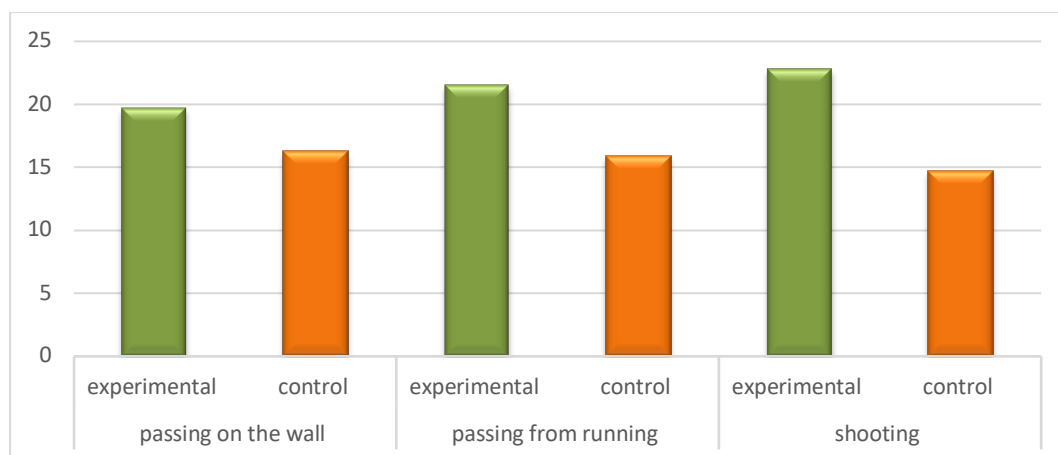
To investigate this, an independent sample t-test was used as shown in Tables (5).

**Table 5:** Independent samples t-test for differences between the experimental group (n = 30) and the control group (n = 30) in the post measurement of the study variables

variable	group	Mean	Std. Deviation	T	DF	P
passing on the wall	experimental	19.700	1.208	11.312	58	*.000
	control	16.300	1.119			
passing from running	experimental	21.500	3.256	7.284	58	*.000
	control	15.900	2.670			
shooting	experimental	<b>22.800</b>	<b>2.074</b>	<b>16.764</b>	<b>58</b>	<b>*.000</b>
	control	<b>14.700</b>	<b>1.643</b>			

- Statistically significant at the level ( $\alpha \leq 0.05$ )

Table (5) and Figure (5) indicates statistically significant differences between the control and experimental groups in the research variables in the dimensional measurement of the variables (passing on the wall, passing from running, shooting) in favor of the experimental group, which enhances the effectiveness of the educational program using the smartphone.



**Fig. 5:** Differences in the performance of the experimental and control group members in the post- test measurement

## 4 Discussions

### 4.1 Discuss the results of the first hypothesis

The researchers attributes the development of the members of the control group because they were exposed to an educational program for a sufficient period of time to make changes in the learners, through what the teacher provides to students of information, concepts and experiences It helps them to achieve the goal of the learning process in addition to direct supervision by the teacher on the students to implement the parts of the educational unit.

This is consistent with what [1]. indicated that the traditional method of teaching depends on the teacher, who makes all decisions, planning, implementing and evaluating, through the prep reparation of the lesson and then its presentation and evaluation, and its various explanations and evaluations. As for the learner, he does what is requested, and this explains the importance of the teacher in this way and increases the effectiveness of the educational process.

The researchers believes that the improvement of the control group is due to the traditional method used, which depends on the verbal explanation of the educational aspects of the skills, and then presenting a model by the teacher to the learners, and then providing a set of exercises to the learners and repeating them, and this works to provide a good opportunity for students to learn and acquire basic skills in handball.

Which indicates the effectiveness of the traditional educational program, and this improvement can be explained by the fact that the traditional method (the teacher) explains in detail the technical aspects of the skill and provides immediate feedback to the learners [18]. indicates that the traditional method takes into account the gradation from the simple to the complex and from the easy to the difficult, and the teacher corrects the learners' mistakes immediately and amends them, which positively and effectively affects the teaching process.

The results of this study agreed with the results of the study [16]. and the study [19]. which indicated that the traditional method contributes in a positive way to teaching motor skills.

### 4.2 Discuss the results of the second hypothesis

The researchers attribute this improvement to the fact that learning using the smartphone uses more than one of the learners' senses (images, written texts, videos), which increases students' motivation to learn without feeling bored, and this leads to their learning according to their individual abilities and in proportion to their personal abilities.

This is consistent with what was indicated by [20]. that learning using the smartphone has a positive effect because it contains a set of video clips and images, which help in the clarity of vision of the learners, which works to maintain the effect of learning for as long as possible and works to attract the attention of the learners and their participation in a positive, and this is consistent with what [21]. indicated that learning using smart phones has a positive impact on the educational process because it contains a set of images and videos that help learners form a clear picture of the skill, which leads to the effect of the intended learning period. Long term and attract the attention of learners and positive participation in the educational process.

The researchers believe that the proposed educational program using the smartphone includes a set of multimedia, which in turn took the learners out of the routine followed in the traditional way so that the student does not feel bored. These programs motivate the learners to exert maximum effort in learning, and this is what was indicated by [22]. Educational programs that depend on the use of multimedia work to motivate learners to make effort in learning and provide appropriate feedback to correct mistakes that learners may make.

This result is consistent with the results of [13, 19, 23, 24]. whose results indicated the positive impact of using the smartphone in teaching sports skills.

### 4.3 Discuss the results of the third hypothesis

The researchers believes that the educational program Prepared and available to learners using the smartphone. Provides a huge amount of information about the skills to be taught.

It also gave the learners an opportunity to control the presentation of this information according to their individual abilities, which gave them enough time to understand and apply this skill positively and with passion for the learner. Learning using smart phones keeps learners away from boredom and routine compared to the traditional method, which may negatively affect the educational process, which reduces their passion and motivation towards learning.

The researchers believe that smart phones give the learner an opportunity to refer to the skills to be taught and to see the skill model and the way it is implemented at any time and to absorb it. Unlike the traditional method, the learner remembers to obtain different information.



This may explain that the improvement is due to the use of a teaching method based on modern technology in education (smart phone), which gave the learners an opportunity, to be the focus of the process and the recipient of information only, but also gives the learner a greater role and effectiveness in the learning process and the learning itself through the learning process in the learning process. Which contains a complete explanation of all parts of the skills under study, with audio and picture and explanation in writing, in addition to a set of videos that explain the way to implement the skills to develop their level in the skill being learned.

[25]. indicates that the use of teaching methods that depend on modern technology in teaching various sports skills gives an opportunity for learners to see the optimal model of the skill to be taught and provides a clearer perception of the skill better in using those skills traditionally.

This result is consistent with the results of [3, 10, 23]. which indicated the effectiveness of using the smartphone in teaching different sports skills?

## 5 Conclusions

The proposed educational program using a smartphone contributed in a positive way to teaching some basic skills in handball, and the members of the experimental group that used the smartphone outperformed the members of the control group in teaching some basic skills in handball.

## 6 Recommendations

1. The necessity of using the learning program using a Smartphone on improving pass and shoot handball skills performance for students of Sports Science faculty at Mutah University
2. Holding a set of training courses for those working in the field of education by preparing and implementing educational programs on a smart phone.
3. Conducting further studies in other sports skills.
4. They need to pay attention to the design and preparation of software using the smartphone, handball in particular, and various sports in general.

## Conflicts of Interest Statement

*The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.*

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