

THE EFFECT OF USING AN AUXILIARY DEVICE IN LEARNING THE ACCURACY OF PERFORMING THE SKILLS OF THE LONG HIGH SERVE AND THE FORWARD VOLLEY FOR FEMALE STUDENTS IN BADMINTON

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Abstract

The research aims to design an innovative device as well as prepare exercises using the device that works like a coach's work by providing the learner with shuttlecocks, the purpose of which is to learn the skill correctly and to know the extent of its impact on learning the skills of the forward stroke and the high serve in badminton. The importance of the research lies in designing an innovative device as well as preparing exercises using The device and its effect on learning the two skills, as well as accelerating the learning process by taking advantage of the device and building the correct motor paths for the skill and moving away from traditional learning accompanied by a colleague. The problem of the research is that beginners face difficulties in learning basic skills and committing to traditional learning without using modern devices that During which correct movement paths for the skill are learned.

The researcher concluded that the innovative device using exercises had a role and was the main factor in the improvement achieved by the experimental group over the control group in learning the accuracy of the skills of the forehand shot and the high serve with the shuttlecock. The researcher recommends using the device in learning skills other than the skills of the forehand shot and the serve and the necessity of diversifying the exercises using the device for the benefit of the learner. And faster learning.

Keywords: innovative device design, special exercises, accuracy of the forehand shot, long high serve, badminton.

Introduction

The researcher believes that educational tools and devices are among the basic means that are used and can be invested in addressing all of the learner's senses. They are based on the participation of more than one sense in forming mental images, perceptions, and concepts in a way that is better than the traditional method based on words. In addition, it provides vivid and powerful experiences that increase the impact of what the learner has learned, which is reflected in learning, as it works to expand the field of observation, thinking, understanding, discovery, innovation, and consolidating information in the learner's mind. It is a set of materials and tools that each person uses. From the teacher or learner to achieve the required educational goals. Among the previous studies that dealt with a topic similar to the topic of the researchers is a

study (Laith Amer Abdel-Jabbar, 2016), through which the effect of exercises using a proposed device was studied in learning the accuracy of performing the offensive dimension strike with badminton, and in another study From the above, the importance of researching the design of an innovative device as well as preparing exercises using the device and their impact on learning the two skills appears, as well as accelerating the learning process by taking advantage of the device and building the correct motor paths for the skill and moving away from traditional learning accompanied by a colleague. The problem of the study came from the researchers examining many researches and studies that dealt with the issue of designing devices in racket games. It was found that most of the previous studies dealt in a simplified manner with the design of exercises using innovative devices, not assistance, and moving away from traditional learning by using trainer exercises or using wall exercises, so they put The researchers took into account that the design of the device should be modern and would work on learning the high serve and the forward dimension stroke without the need for a coach to provide the learner with exercises that are not accompanied by tools and devices, through which the correct movement paths are built. Through what is explained, the researchers decided to delve into designing a device and exercises using the device. It works on teaching female students the accuracy of performing the two skills in badminton.

Aim of the study

Designing an innovative device and using it to teach female students the two skills in badminton, as well as preparing special exercises using the device to learn the accuracy of performing the two skills for female students in badminton.

Research procedures

The researchers used the experimental approach with two control and experimental groups with pre- and post-tests. This is because the approach is compatible with the objectives of the research and contributes to solving its problem. The research community was limited to the female students of the first stage in the College of Physical Education and Sports Sciences at the University of Baghdad for the academic year 2023-2024, and they are deliberately numbered. (101) female students were distributed among three sections, and (32) female students were chosen by lottery to represent the research sample, as the sample percentage constituted (31.68%) of the total research population, as (16) female students were selected from Section (I) from the total (32) female students to represent the control group to which the college curriculum was applied, and (16) female students from Section (H) were chosen from a total of (32) female students to represent The experimental group to which exercises on using the innovative tool and device were applied, as the researcher worked on conducting an equivalence test for the skill tests. On the research sample for the control and experimental groups, to find out that the two groups started from only one starting point and that there was no previous learning for the sample, and this is what the results showed in Table (1), as the Results in the skill tests showed randomness for all tests, and this is evidence that the sample started from one starting point and that there was no learning. Previous for female students.

Table (1) shows the arithmetic means, standard deviations, T value, and significance value for the equivalence test for skill variables.

Exploratory experiment

The exploratory experiment on the device used in the research was conducted, which lasted one day on (10/24/2023) on a sample consisting of (5) female students who were randomly selected

indication	Indicative value	T value	Experimental group		Control group		measruing unit	Variables
			A	s	A	s		
random	0.441	0.781	1.377	12.19	0.816	12.50	degree	Long high transmitter
random	0.486	0.705	1.204	13.63	1.302	13.31	degree	Front dimensions stroke
Significant at level> 0.05 with 30 . degrees of freedom								

from the research community. Which were not chosen from among the control and experimental group. The purpose of conducting the experiment is to identify the efficiency of the assistant work team in using the device, and also to learn about how the device works and to choose the appropriate place to place the device inside the stadium.

Long high transmission test. (Moin Muhammad Taha, 2001)

- Test purpose: to measure the skill of the long high serve.
- Application of the test: It was applied to a sample of institute and college students for both genders.
- Evaluation of the test: The degree of reliability was (0.87) and objectivity (0.78)
- Required tools: badminton rackets, flying feathers, an assistant, and a planned court with the design of the test as in the drawing.

How to implement the test

The serving player stands in the (x) area and serves high and long so that the shuttlecock crosses over the net, then over the player who holds his racket while it is extended upward in the (O)

area, trying to drop the shuttle in the area with the highest degree, and the player serves (12) attempt.

Points calculation

The score is given according to where the shuttlecock falls.

The shuttlecock that falls on a line between two areas is given the higher score.

- The final score is the sum of the best (10) serves out of (12)
- The points are divided into (1, 2, 3, 4, 5)
- The maximum score for the test (50 marks)

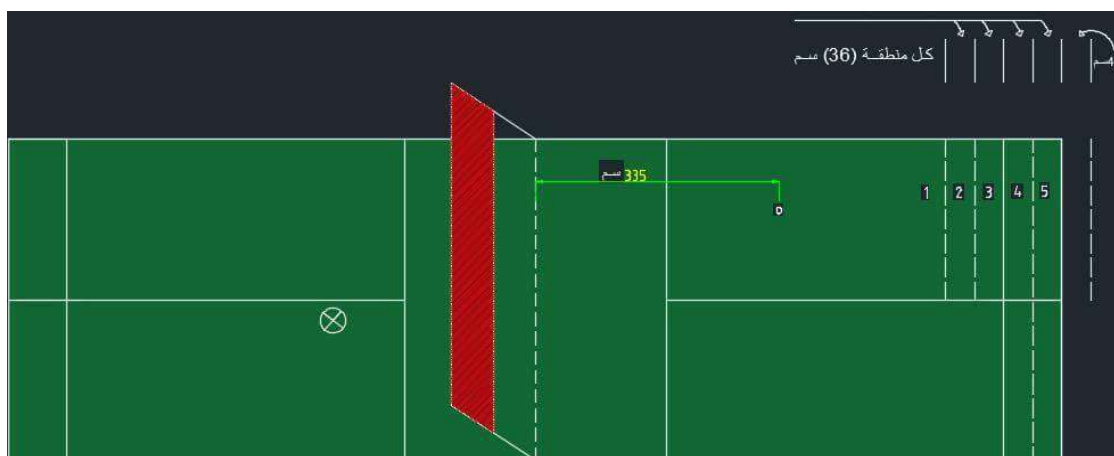


Figure (1) shows the long high transmitter test.

Front dimensional impact test

- Test name: Front dimensional impact test.
- Test purpose: to measure the accuracy of the front dimensional strike performance.
- Required tools: badminton rackets, flying feathers, shuttlecock, playground.

How to perform the test: In the forehand, the player stands with his right foot at a distance of (1 m) from the service line and his racket in the forehand position. He hits the shuttlecock sent to him from the opposite court so that it crosses over the net, then the server's racket, trying to drop it in the area with the highest score. Which are listed from (1,2,3,4,2)

Points calculation

1. The player performs (12) attempts and calculates the total of the best (10) attempts.
2. The score is given according to where the shuttlecock lands.
3. The shuttlecock that falls on a line between two regions is given the highest score.
4. The final result is the sum of the best (10) serves out of (12)
5. The maximum score for the test (40 marks)

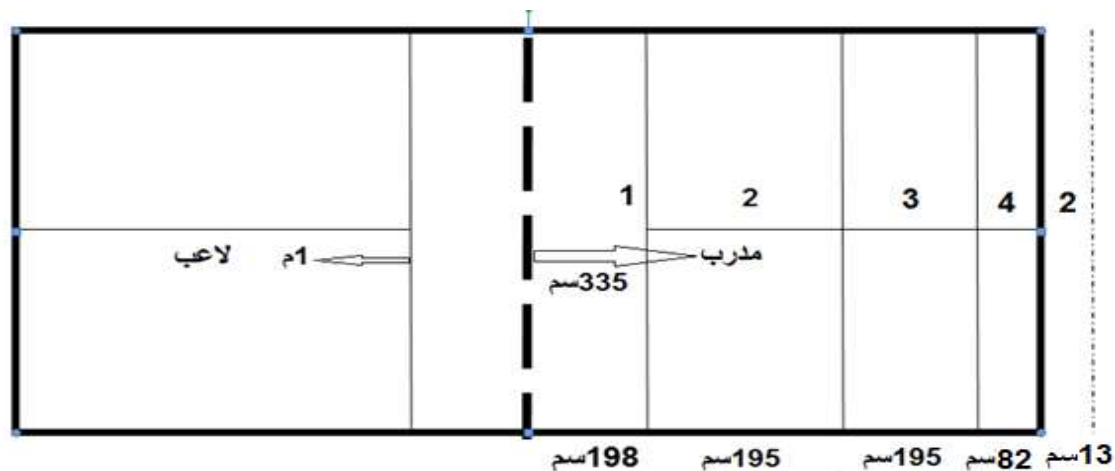


Figure (2) shows the front dimensional impact test.

Main experience

Pre-test: The pre-tests for the control group were conducted on 10/25/2023 - 10/26/2023, on Wednesday and Thursday, respectively. The skill tests were conducted on Wednesday, 10/25/2023, for the control group, and on the following day, Thursday, 10/26/2023. The researchers conducted skill tests on the experimental group at the same time and under the same conditions. After conducting the pre-tests, the researcher carried out the exercises using the device by the assistant work team under the supervision of the researcher and implemented them on the female students of the experimental group for the purpose of learning the skills (serving, forward stroke). The exercises were carried out using the device on 10/29/2023 until 10/30/2023. The duration of implementing the exercises on the experimental group continued (8) weeks, at two units per week, as the total number of units reached (12) educational units, as the researcher worked in agreement with the teacher. Taking a time of (35) minutes, the time of the main section, to perform the exercises on the experimental group. The researcher divided the female students into two groups, each group consisting of (8) female students, and they were distributed on the device. Each exercise for one group takes (15) minutes. Each (4) female student stands on one device, and each (4) female student stands waiting for the first group to finish, and upon completion. The second group works with the same total work time for each exercise (15 minutes). The researcher emphasized giving the same repetitions of work periods and rest periods to both groups, in addition to taking care to give the same number of repetitions given to the control group by the teacher.

Description of the device and how it works

The device consists of a control box, which consists of an operating button, a button to control the speed of the feathers' fall, and small green lights are installed on it. It contains a battery inside for charging, through which the magnetic field is connected to the disk carrying the feathers. At the top of the box there is a link for the process of placing The wires are connected to the metal ring, and there is a connector at the bottom of the device through which the device is charged. As for the ring that holds the feathers, it is a circular disc to which cylindrical plastic tubes are connected. At the bottom of it there is a magnet to place the feathers. At the top of the

metal ring is attached a small box in which the wire connector is placed, and it is mounted on it. Hooks to hang the ring on the horizontal crossbar. The horizontal crossbar is placed on the field and in a specific place on the field according to the type of exercise required, and connecting wires are attached to the crossbar. The circular ring carrying the feathers is attached by means of clips to the width of the crossbar tube, and a ring is fixed on one side and a second ring on the other side, and they are connected by a wire, and it comes out of The circular ring is another wire that connects to the control device. It activates the device using the start button. The operation of the device is known by the glow of a green light on the control interface. The device is then activated by pressing the button. When pressed, it gives a sound that the device is ready to put in the feathers. As soon as the sound comes out of the control device, the control generates A magnetic field in the ring fixed on the crossbar, which generates a magnetic field in the arms descending from the ring, which contains at the bottom a small circular piece in which a magnetic field is generated, which attracts the shuttlecock and sticks to it through a small metal piece placed inside the shuttlecock for the purpose of being attracted to the arms with the magnetic field. The feathers are placed on the magnetic arms using a long stick with a funnel attached to it, inside which the feathers are placed. When the feathers are finished, the student takes the position of readiness to perform the exercise, as he controls the speed of dropping the feathers through the control button on the interface and adjusts the speed of the feathers. When the speed of the feathers is set, the trainer By pressing the remote control button on the remote control, the feathers begin to fall one after the other. When the exercise is completed and all the feathers fall, the device emits a sound stating that all the feathers have fallen and prepare for the next exercise after completing the process of placing the feathers in the metal ring again using a circular tool perforated with ten holes. The shuttlecock is placed inside it and is fixed with a wooden tube. The feathers are placed in the holes and raised to the ring, and the feathers are stuck to the ring. The goal of this device is to learn (the skill of the long high serve, the forehand shot)

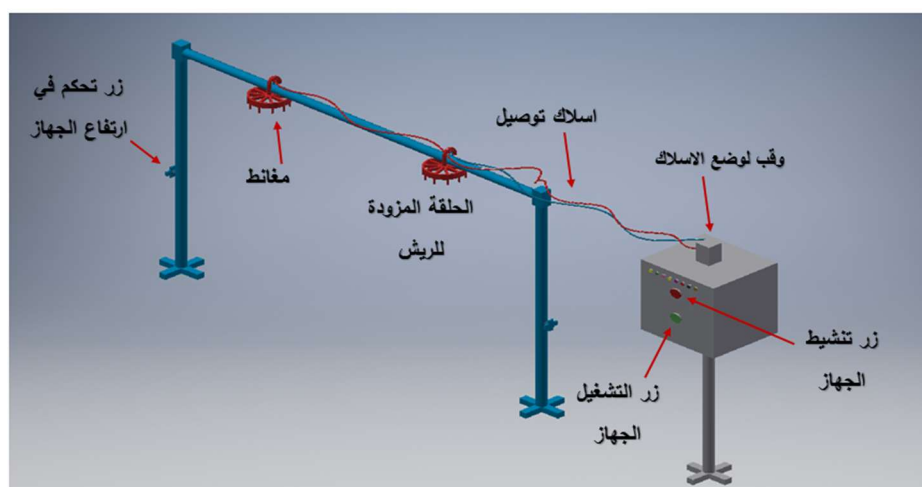


Figure (3) shows the device used in the educational units.

Posttest

After completing the implementation of the educational units on the experimental group, the researcher conducted post-tests on 2/6/2024 on the control group and on the next day, 2/7/2024, at the same time and under the same conditions, and extracted results to measure the extent of learning and improvement that occurred in the experimental group compared In the control group.

Presentation and discussion of results

The researcher presented the results of the pre- and post-tests for the experimental and control group, by displaying the arithmetic means and standard deviations in illustrative tables after performing the necessary statistical operations for them, in order to facilitate observing the results, in addition to making a comparison between the experimental and control group in the pre- and post-tests by analyzing the results of all tests. And interpreting them to know the reality of the differences and their statistical significance, according to a precise scientific perspective, in order to achieve the research objectives and hypotheses.

Table (2) It shows the values of the arithmetic means, standard deviations, and skewness coefficient for the pre- and post-tests of the control group in the skill variables.

Posttest			Pretest			measruing unit	Skill variables
Torsion coefficient	A	s	Torsion coefficient	A	s		
-0.277	1.088	17.13	0.420	0.861	12.50	degree	Long high serve skill
0.483	1.692	17.94	-0.046	1.302	13.31	degree	Forward strike skill

Table (3) shows the differences values, the calculated T value, and the calculated significance value in the pre- and post-test for the control group in the variables.

indication	Indicative value	T value	F e	F	measruing unit	Skill variables
moral	0.000	19.323	0.239	4.625	degree	Long high serve skill
moral	0.000	8.023	0.576	4.625	degree	Forward strike skill
Significant> .at 15 degrees of freedom 0.05						

The results of Tables (2) and (3) show that there is a difference in the calculated values of the arithmetic means and standard deviations between the pre-test and the post-test for the performance level of the skills (serving, forward dimension skill), respectively, for the control group. This indicates that there are significant differences between the results of the two pre-tests. And the posttest in all types of skills and in favor of the posttest, as all significance values are less than (0.05), which is an indicator of the significance of the differences. The researchers

attribute the reason for this to the fact that the control group was influenced by the educational curriculum prepared by the college and the subject teacher, and the reason for the improvement in the level of the female students is also due to the lesson containing many activities and competitions between the female students, which made them attracted towards the college program, which led to an improvement in the level of learning in skills. The researcher also attributes the process of improvement in the students' learning level to the exercises set according to a frequency and time known by the teacher and by adjusting the exercises in terms of the number of repetitions, and relying on the principle of gradation by the teacher from easy to difficult. Because the lesson included competition between the students generated by the subject teacher, it increased the students' desire to move and raised the level of excitement and suspense and their drive towards learning skills. This is what (Wajih Mahjoub 2002) points out: "It is important for individuals to be motivated to learn motor tasks for the purpose of obtaining maximum learning." If the learner views the task as not meaningful or not preferable, learning will be limited, and if motivation is very low, learning may not occur at all. In addition, the improvement in the level of results came through continuous repetition of the skill with correction of errors by the teacher. The researcher also attributes the differences in test results to the students' interest in studying badminton, continuous work, continuity in practice and learning, and the students' continued commitment to attendance and lack of absence.

Table (4)

It shows the values of the arithmetic means and standard deviations for the pre- and post-tests of the experimental group for the skill variables.

Table (5) It shows the values of the difference of means, standard deviations, (T) value, and (significance value) values calculated between the pre-test and post-test for the experimental

Posttest			Pretest			measruing unit	Skill variables
Torsion coefficient	A	s	Torsion coefficient	A	s		
1.137	1.455	21.88	0.473	1.377	12.19	degree	Long high serve skill
-0.434	1.778	22.69	-0.205	1.204	13.63	degree	Forward strike skill

group in the skill variables.

indication	Indicative value	T value	F e	F	measruing unit	Skill variables
moral	0.000	19.147	0.506	9.688	Class	Long high serve skill
moral	0.000	17.985	0.504	9.063	Class	Forward strike skill
Significant> .at 15 degrees of freedom 0.05						

The results of Tables (4) and (5) indicate that there are significant differences between the results of the pre- and post-tests of the experimental group in the skills studied and in favor of the post-test, and this is what fulfills the research hypothesis. The researcher attributes the reason for the improvement in the results of the post-test in skills performance to the effective and significant role of the innovative device. Which worked to improve the sample members, because the device was designed according to the nature of the skills and the ability to control the speed required for the speed of the shuttlecock's fall, as (Aws Saadoun, 2014) confirms that the use of modern devices and tools that are appropriate to the form of the skill and the way it is performed and differ from the traditional method of learning leads to There is a noticeable improvement in the performance of this skill if these devices and tools are used correctly and scientifically, and this is what gives a great benefit at the beginning of the educational units, as the students at the beginning of learning appear to have errors and difficulty performing the skills correctly, and the difficulty of giving quick feedback, and this What the researcher worked on at the beginning of learning was to give sufficient time to the students to prepare and focus enough to perform the skill, hit the shuttlecock correctly, achieve the required purpose of the tools, and achieve the goal of the exercise. After progressing in the educational units, the students began to receive the information correctly and understand the motor path of the skill in the desired manner, and became They have appropriate reactions and acquire motor skills, so the researcher intended to give a more difficult exercise to increase the principle of excitement and suspense for the exercise and to obtain the desired benefit from the tools, as (Youssef Qatami, 1998) confirms that assistive devices and tools make the individual more focused on the skills to be learned and developed and help The devices provide great diversity in performing skills, which improves performance for the better.

The researcher also attributes the significant differences in the level of skill performance, which appeared in the results of post-tests of arithmetic mean values, to the exercises designed using the device, in which the researcher took into account the extent of ease and difficulty and their suitability to the sample members, and he worked on the principle of gradation in performing the exercises from easy to difficult, as the designed exercises were similar to the path. The motor skills are performed within a known time and repetition, as the more the exercises are similar to the motor path of the skill, it leads to an improvement in the motor performance of the skill, and this is what was confirmed by (Mahmoud Dawoud Al-Rubaie, 2012) that the exercise is a known motor performance in time and repetition, and it is not possible to learn except through it, which It leads to learning the motor performance of the skill.

The exercises applied using the innovative device worked on learning motor skills and increasing the level of improvement in skill performance through implementing the correct motor path for the skill, storing motor programs similar to the skill, and getting rid of and correcting errors that appeared at the beginning of learning and replacing them with the correct performance of the skill, as Osama Kamel Rateb confirms. (1999) Delaying the correction of errors leads to the difficulty of getting rid of them, and the earlier it is possible to correct the

error, the greater the speed of learning. It also works to increase the concentration of the sample members, which works to maintain the correct image of the skill and create the appropriate program for each type of exercise, and this is what is confirmed by (Yarub). Khayon, 2002), that the process of diversifying training will generate a general and flexible program that the learner can invest in the changing circumstances of skill performance. The researcher believes that the use of special exercises by the experimental group in the main part of the educational unit had a clear impact on improving the students' performance level, as the main part included exercises for special tools prepared by the researchers, which was a new method that eliminated the boredom that gripped the students as a result of using the exercises. Traditional and usual, and this is what was confirmed by (Dhafer Hashim Al-Kazemi, 2002), that the use of various applied organizational exercises in different educational settings helped the learner to control and control performance requirements, choose appropriate exercises similar to the skill, and increase repetitive attempts, which are among the basic requirements for learning.

Table (6) shows the values of the arithmetic means, standard deviations, and skewness coefficient for the post-tests of the control and experimental groups in the skill variables.

Posttest			Pretest			measruing unit	Skill variables
Torsion coefficient	A	s	Torsion coefficient	A	s		
1.137	1.455	21.88	-0.277	1.088	17.13	degree	Long high serve skill
-0.434	1.778	22.69	0.483	1.692	17.94	degree	Forward strike skill

Table (7) shows the values of the differences of the arithmetic means, the "T" value, and the "significance value" values for the post-tests for the control and experimental groups in the skill variables.

indication	Indicative value	T value	measruing unit	Skill variables
moral	0.000	10.459	degree	Long high serve skill
moral	0.000	7.741	degree	Forward strike skill
at 30 degrees of freedom 0.05> significant				

Discussing the results of the post-tests for the control and experimental groups regarding the skill variables:

It is clear from Tables (6) and (7) that there are significant differences between the two groups and in favor of the experimental group in the post-test, and this is what fulfills the research hypothesis. The researcher attributes this improvement and learning of skills to the commitment shown by the experimental group to implementing the exercises correctly, and using diversity in implementing the exercises. In multiple forms and different situations, some of which are close to the network and some are far away, as (Nahida Abdel Zaid, 2010) confirms that the great diversity of exercises and their different conditions, which are developed according to scientific foundations and educational principles, which aim to enable the learner to reach the best possible performance in various events and activities, and the researcher also attributes The reason for the improvement in the level of skill performance by the experimental group and the emergence of learning among the students is through the lack of errors when performing the exercises for the innovative tools by the researcher, in which the appropriateness of the exercises to the sample was taken into account and the use of the principle of diversity in preparing exercises to avoid boredom and lack of desire to perform and to design exercises. It is similar to the skill with repetitions appropriate to the level of the sample, and this is what is confirmed by (Adel Fadel, 2006). The principle of repetition and repetition alone does not guarantee the development of the skill, but it does achieve continuity in the performance of motor behavior. The researcher also relied on the principle of progression in giving the exercises from easy to difficult and then more difficult according to improvement. Which was shown by the students of the experimental group and explained and presented correctly by the assistant work team, in addition to the continuous work on performing the exercises, giving feedback, correcting errors, adjusting the time and repetitions for each of the unit exercises, and controlling the position of the tool and its heights during performance in a way that suits the nature of the skills and how they are performed in the course. Correct training of all skills led to positive effects in the learning process, and the researcher believes that innovative tools are an effective element in reducing effort and saving time, which would move away from traditional learning that is limited to exercises with a wall and a partner, and does not include modern tools that approach the reality of movement or movement. The skill to be learned is in the mind of the learner, as it also works to transform movements and skills into live experiences aimed at reaching a good stage of learning, and this is what the tools worked on as they were designed in light of the skill and they work to reduce the effort expended on the students without working on excessive movements that lead to Fatigue and exerting more effort. The researcher believes that the improvement that accompanied the experimental group in the performance of skills when progressing in the educational units was mediated by the correct use of the device and the tool by performing the exercise in the required manner, avoiding excessive movements, performing movement paths in the required manner, and reducing errors, by adhering to the researcher's directions, giving feedback, and giving instructions on directing The feathers to the desired place. The reason for the improvement is also due to placing numbers on the playing field and asking the students to perform the skill and direct the feathers to the desired place for the feathers to fall and obtain the highest possible score, which focuses the students' focus on using the correct path and the required force to direct

the feathers to the place that achieves the best result. The researcher concluded that the innovative device used improved the students' performance in learning all the studied skills. Implementing the exercises using innovative tools had an important impact on the clear improvement of the experimental group over the control group in learning the accuracy of some basic skills for female students in badminton, in addition to giving repetitions appropriate to the level of female students using the tools, and using exercises in different positions and diversity and grading them from easy to difficult. Taking the appropriate place and moving in light of the exercise led to learning and a noticeable improvement in the accuracy of some of the female students' basic badminton skills. The researcher recommends using the device to learn other skills, such as the forehand drop and the smash. It is necessary for the teacher to be aware of the importance of innovative tools and their role in learning the accuracy of performing basic skills with badminton and the use of tools appropriate to the type of skill, in addition to using different heights and different speeds of the tools to learn other skills different from the skills studied.

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