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The effect of combined educational exercises (Physical-skills) to develop student's special force and technical performance in shot put

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Abstract

The purpose of this paper is to preparing complex educational exercises (physical - skill) to develop the students' special force and technical performance (shot put), and identify the effect of combined educational exercises (physical - skill) in developing the students' special force and technical performance (shot put). The researcher used the experimental method in the style of two equivalent groups (experimental and control) in order to suit the nature of the problem. The College of Physical Education and Sports Sciences, University of Babylon determine the number of students in the first stage, for the academic year 2022-2023. They number (80) students. A sample was drawn using a simple random method with a number of (40) students, and they were divided into two groups equally, control and experimental. One of the most important results reached by the researcher is that: Combined educational exercises (physical-skills) contributed to developing the students' special force and technical performance (shot put), and the coach program contributes to the development of the students' special force and technical performance, shot put. One of the most important recommendations recommended by the researchers is that: Necessity of applying complex educational exercises (physical - skill) prepared by the researcher for their impact on developing the types of special force and technical performance of shot put for students, and need for teachers to pay attention to developing special types of force because of their impact on the technical performance of students' shot put.

Keywords: Complex educational exercises (physical-skills), special force, technical performance, shot put

Introduction

The most important characteristic of our present era is the great scientific and technical development that has taken place in the fields of life, and the emergence of the products of modern scientific inventions that have brought about major changes in our modern life. This development has opened good horizons for research and knowledge and has entered into all areas of our lives, including the sports field, which is considered one of the Means of measuring the level of cultural and social progress of the people of any country in the world. This is clearly demonstrated by the progress achieved by developed countries in achieving high sporting achievements.

Compound educational exercises are the only bridge for these two aspects and create a positive relationship because of its distinctive role in developing physical and skill qualities at the same time and employing them during competitions between the ability to jump, change direction and spin, and the clear effect of them appears in the face of competitor pressure or momentary and sudden change during skill performance. Special force includes several types, such as explosive force, force characterized by speed, and endurance, which is a special physical ability that is built on general physical ability, which is muscular force. General force is the foundation on which special force is built, and both of them represent one of the basic pillars for improving the performance of the basic skills of the sport of football. Hand. Arena and field events are among the events that have a distinguished position among other types of sports because they include various activities such as running, jumping, vaulting, all kinds of throwing, mail, and walking.

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It is called the mother of games because it is the foundation upon which the rest of the games are built because it develops physical qualities, including force, speed, stamina, agility, flexibility, and others.

The shot put event is one of the old events that entered the Olympic Games for the first time in 1896 for men and for the first time for women in 1948. The level of performance and achievement in this event has developed significantly in recent years, and many factors have helped in this development, including the use of learning methods and methods. Training and through scientific and technical development in the field of physical education teaching methods to facilitate the learning process and advance towards the best.

The importance of the research comes through the preparation of complex educational exercises (physical - skill) to develop the special force and technical performance of shot put, because it has a "clear" effect on the students' performance by reducing effort and time and increasing their desire and excitement.

Research problem

The researcher noticed that there was a weakness in technical performance in the effectiveness of shot put among first-year college students, which generated an incentive to study how to better develop or improve technical performance, knowing that these students will be teachers in the future and work to teach their students the sporting events that they have learned well.

The modern shot put event requires the fulfillment of all its requirements, and these requirements are characterized in particular by an overlap in physical and skill capabilities during performance. Because the researcher is a university professor who practices the teaching profession, she noticed that training the effectiveness of shot put in universities focuses in their educational units on the physical and skill aspects separately, and thus does not give sufficient time in teaching shot put along with physical exercises that aim to develop and improve. The effectiveness is within a single, fluid framework, and the researcher wanted to increase interest in this. He prepared complex educational exercises (physical - skill) in order to integrate physical and skill training as a single unit, and through this interaction, he develops the types of special force and technical performance of shot put for the students.

Research objective

- Preparing complex educational exercises (physical - skill) to develop the students' special force and technical performance (shot put).
- Identify the effect of combined educational exercises (physical - skill) in developing the students' special force and technical performance (shot put).

Research hypotheses

- Combined educational exercises (physical-skills) have a positive effect on developing the students' special force and shot put performance.

Research fields

- Human field: Students of the first stage, College of Physical Education and Sports Sciences, University of Babylon, for the academic year 2022-2023
- Time field: (10/10/2022) to (5/4/2023)
- Spatial field: The private playground for the track and

field lesson at the College of Physical Education and Sports Sciences, University of Babylon.

Research methodology and field procedures

Research Methodology

The nature of the problem to be studied is what determines the nature of the method. The researcher used the experimental method in the style of two equivalent groups (experimental and control) in order to suit the nature of the problem.

Community and sample research

The number of students in the first stage is determined by the College of Physical Education and Sports Sciences, University of Babylon, for the academic year 2022-2023. They number (80) students. A sample was drawn using a simple random method with a number of (40) students, and they were divided into two groups equally, control and experimental.

Steps of field research procedures.

Nomination of tests (physical - skill)

The researcher chose a group of physical tests and technical performance by paying shot put to students to be an indicator to measure the extent of physical and skill development among the sample. The researcher sought the help of a group of experts in determining the research tests through a questionnaire form and determining the appropriate tests for the research sample to determine their suitability and the tests they are.

1. Throwing a 2 kg medicine ball test;
2. The three bounding test with the right and left leg.
3. Test of bending and extending the arms from the Push-up for 10 seconds
4. Jump from stability
5. Technical performance by shot put

Exploratory experience:

The exploratory experiment was conducted on 20/10/2023 on a sample of (6) students other than the research sample. The experiment was conducted at exactly 10 am in the athletics field at the University of Babylon for physical and skill tests, and after 5 days the same experiment was repeated. On the individuals themselves on 25/10/2023, the aim of which was:

1. Ensure the suitability of these tests for the study sample.
2. Ensure the validity of the tools and equipment used in the study.
3. Identifying errors and problems that may appear during measurement in order to avoid them in the basic study.
4. Knowing the time, it takes to conduct the tests.

Scientific foundations of tests:

The main goal of conducting tests is to obtain real and accurate results through which the researcher can make judgments, and in their appropriate decisions are made. Therefore, the researcher created scientific parameters represented by (validity, stability, and objectivity), which are among the most important features of a good test.

Test Validity

Validity is "the accuracy with which the test measures the purpose for which this test was developed (Kamash, 2002) ^[1]. Therefore, the researcher extracted validity by means of the validity of the content or content of the physical and skill tests under research, by presenting the tests to a group of experts

and specialists, before implementing them to judge the extent Its validity and ability to measure what it was designed for, and its suitability to the level of the sample members, then finding a high percentage of agreement to achieve the validity of the test.

Test stability

The stability of the test is the value that expresses the accuracy of the test in extracting stable results if it is repeated more than once on the same sample to give close results (Al-Khouly, 1998) [2]. The researcher calculated the stability coefficient using the method of applying the test and then re-applying it with a time interval of five days between the two applications and under the circumstances. Herself.

Objectivity

Objectivity is defined as “the extent to which the arbitrator or examiner is free from subjective factors (Majeed, 1999) [3]. The researcher verified the objectivity of the skill tests used and their suitability to the level of the sample, by calculating the simple correlation coefficient (Pearson) between the scores of two evaluators, and the results showed that all tests It has high objectivity, and from the above it is clear that the evaluation results are not affected by the expert’s personal or subjective factors. Freedom from fanaticism and bias and not introducing personal factors to the experimenter, such as his opinions, personal whims, personal inclinations, and even his bias or fanaticism. It means describing the individual as he actually exists, not as we want him to be” (Majeed, 1999) [3] and as shown in Joule (1).

Table 1: Shows the results of the validity and stability of the physical and skill tests

Tests	Stability by test and retest			Objectivity (validity between arbitrators)		
	Std. Deviations	Level sig	Type sig	Std. Deviations	Level sig	Type sig
Throwing a 2 kg medicine ball test	0.849	0.000	Sig	0.859	0.000	Sig
The three bounding test with the right and left leg.	0.857	0.000	Sig	0.883	0.000	Sig
Push-up for 10 seconds	0.891	0.000	Sig	0.911	0.000	Sig
Jump from stability test	0.812	0.000	Sig	0.825	0.000	Sig
Technical performance by shot put	0.881	0.000	Sig	0.929	0.000	Sig

Pre-tests

Pre-tests were conducted on the research sample of (40) students representing the experimental and control groups, at a rate of (20) students for each group, on 29/10/2022 at ten in the morning.

Sample homogenization procedures

Homogeneity was performed in the variables (Length, weight, chronological age) by using the skewness factor, as shown in Table (2).

Table 2: shows the homogeneity of the sample

Variables	Mean	Median	Std. Deviations	Skewness
Length	173.12	170	2.10	0.29
Weight	70.28	68	1.66	0.61
Chronological age	18.02	18	0.05	0.19

It is noted from Table (2) that the values of the skewness coefficient for the variables referred to in the table were limited to (+1), which indicates the homogeneity of the research sample in all of them, and that they are within the normal curve of the distribution.

Equivalence of the sample

In order to verify the equivalence of the research group, the research conducted the equivalence of the research group (pre-tests) for all tests under study, as shown in Figure (3).

Table 3: Shows the parity of the sample for the experimental and control groups

Tests	Groups	Mean	Std. Deviations	T value Calculated	Level sig	Type sig
Throwing a 2 kg medicine ball test	Experimental	8.23	1.36	2.000	0.058	Non sig
	Control	8.30	1.21			
The three bounding test with the right and left leg.	Experimental	12.63	2.11	0.462	0.649	Non sig
	Control	12.90	2.06			
Push-up for 10 seconds	Experimental	9.13	0.79	1.494	0.149	Non sig
	Control	9.20	0.73			
Jump from stability test	Experimental	2.11	0.57	2.057	0.052	Non sig
	Control	2.09	0.48			
Technical performance by shot put	Experimental	3.83	0.77	0.430	0.671	Non sig
	Control	3.51	0.63			

It is clear from the table that all the calculated T values between the experimental and control research groups were not statistically significant when compared to the Sig score values, which were greater than 0.05, which indicates their equality in the pre-tests and that they are on the same starting

line.

Complex educational exercises

The researcher prepared special complex educational exercises (physical - skill) in accordance with the

requirements of the event, basing its preparation on the scientific foundations of sports training, and on scientific sources as well as personal interviews, as the researcher worked on installing these capabilities in implementing the training vocabulary curriculum. The researcher took into account the following foundations when composing exercises (physical - skill):

- The exercises must be at the level of the students' abilities.
- The exercises should be written in a correct scientific manner to make them easy to understand.
- Using the principle of diversification, as some are performed with tools and others without tools.
- Using exercises similar to the nature and direction of the performance in technical performance (shot put).
- Using exercises to develop tactical aspects as part of training.
- Implementing the components of the training curriculum.
- The compound exercises were applied to the experimental group from 30/11/2022 to 30/12/2022.
- The duration of the training program is (4) weeks.
- The training unit was divided according to the three sections of the training unit, which are the preparatory, main, and final section. The time of the training unit was

(90 minutes), and the share of the compound exercises was from (26 minutes to 42 minutes), and it represents part of the main section, noting that the time of the entire main section is (70 minutes).

- The researcher used medicine balls weighing from (1 kg to 3 kg).
- The researcher used balance in the compound exercises (that is, the researcher took into account exercises for the legs, then the arms, then the torso).

Post-tests

Post-tests were conducted for the experimental and control groups on 2/1/2023, at ten (10) in the morning. The researcher was keen to create the conditions in which the pre-tests were conducted in terms of time, place and necessary tools.

Statistical methods: The search data was processed through the Statistical Package for the Social Sciences (SPSS).

Results and discussion

Results

Presenting, analyzing and discussing the results of the pre- and post-tests in the tests for the control group

Table 4: Shows the arithmetic means, standard deviations, and T-value calculated for the pre- and post-tests for the control group.

Variables	Pre-test		Post-test		T value Calculated	Level sig	Type sig
	Arithmetic means	Standard deviations	Arithmetic means	Standard deviations			
Throwing a 2 kg medicine ball test	8.30	1.21	9.12	1.01	2.12	0.000	Sig
The three bounding test with the right and left leg.	12.90	2.06	14.03	1.68	2.60	0.000	Sig
Push-up for 10 seconds	9.20	0.73	10.15	0.63	2.19	0.000	Sig
Jump from stability test	2.09	0.48	2.20	0.38	1.88	0.000	Sig
Technical performance by shot put	3.51	0.63	5.22	0.79	3.40	0.000	Sig

Table (4) shows the values of the arithmetic means and standard deviations between the pre- and post-tests for the control group. Through our observation of the arithmetic means and standard deviations, we see that they are different between the two tests. Accordingly, the researcher used the (t) test for correlated samples, and the calculated (t) values

appeared significant for all tests because the value of the (Significant significance) is less than the significance level (0.05), and therefore there is preference for post-tests.

Presenting, analyzing and discussing the results of the pre- and post-tests in the tests for the experimental group:

Table 5: Shows the arithmetic mean, the standard deviation, the calculated T-value, and the statistical significance of the results of the two tests (pre-post) for the variables for the experimental group.

Variables	Pre-test		Post-test		T value Calculated	Level sig	Type sig
	Arithmetic means	Standard deviations	Arithmetic means	Standard deviations			
Throwing a 2 kg medicine ball test	8.23	1.36	11.29	1.07	4.62	0.000	Sig
The three bounding test with the right and left leg.	12.63	2.11	16.25	1.88	3.39	0.000	Sig
Push-up for 10 seconds	9.13	0.79	12.05	0.41	4.38	0.000	Sig
Jump from stability test	2.11	0.57	2.40	0.36	2.49	0.000	Sig
Technical performance by shot put	3.83	0.77	9.17	0.66	6.70	0.000	Sig

Table (5) shows the values of the arithmetic means and standard deviations between the pre- and post-tests of the experimental group. Through our observation of the arithmetic means and standard deviations, we see that they are different. Accordingly, the researcher used the (t) test for

correlated samples. The (t) values appeared. The calculation is significant for all tests because the value of the (Significant significance) is less than the level of significance (0.05), and therefore there is a preference for post-tests.

Presenting and analyzing the results of the post-tests for the motor ability tests and the technical performance

variable for the shot put push event for the two groups (experimental and control).

Table 6: Shows the arithmetic mean, the standard deviation, the calculated (t) value, and the statistical significance of the results of the post-tests for the variables for the control and experimental groups.

Variables	Control		Experimental		T value Calculated	Level sig	Type sig
	Arithmetic means	Standard deviations	Arithmetic means	Standard deviations			
Throwing a 2 kg medicine ball test	9.12	1.01	11.29	1.07	3.55	0.000	Sig
The three bounding test with the right and left leg.	14.03	1.68	16.25	1.88	4.11	0.000	Sig
Push-up for 10 seconds	10.15	0.63	12.05	0.41	3.67	0.000	Sig
Jump from stability test	2.20	0.38	2.40	0.36	2.18	0.000	Sig
Technical performance by shot put	5.22	079	9.17	0.66	6.77	0.000	Sig

Table (6) shows the values of the arithmetic means and standard deviations between the post-tests and for the control and experimental groups. Through our observation of the arithmetic means and standard deviations, the researcher used the (t) test for independent samples, and the calculated (t) values for all tests appeared because the value of the (Significant significance) is less than the level of significance. (0.05) Therefore, there is an advantage for the experimental group.

Discussion

Through the above presentation and analysis of the previous tables, it is clear that there is a development in the tests for the students for the control and experimental group. The researcher attributes the development of the control group to the trainer's exercises and relying on his experience in forming the training units in which the use of physical exercises with high intensity included the use of resistance such as body weight and body weight. The partner and the various jumping exercises that led to the emergence of this development and the differences between the pre- and post-tests for the control group and in favor of the post-test. What is the reason for the control group's preference for the experimental group between the pre- and post-tests and in favor of the post-test? The researcher attributes the development of the explosive power of the legs for the experimental group to the effect of the combined educational exercises (physical - skill) that the researcher used, which affected the development of the results of explosive power in a significant way, as jumping exercises helped in developing the explosive power of the legs when used accurately and in a scientifically studied manner in accordance with the requirements of load distribution. The correct training within the limited time period and taking into account the sample's abilities in applying the appropriate exercises according to their physical ability, taking into account the gradation of intensity and rest between repetitions and between exercises, and using the training working hours in an organized manner and the time duration of the compound exercises used that was appropriate according to the requirements of the sample members. This confirms "The opinions of experts, regardless of their different sources of scientific and practical culture, confirm that the training curriculum inevitably leads to the development of achievement if it is built on a scientific basis in organizing and programming the training process and using appropriate, gradual intensities, as well as the use of optimal repetitions and effective inter-rest periods, under the supervision of specialized trainers Under good training conditions in terms of place, time, and tools used" (Ismail, 1996) [4]. In training the explosive power of the muscles of the legs, the researcher mainly used exercises using body weight

and jumping of all kinds, and using aids represented by barriers of different heights and boxes as well. This helped in developing the muscle force of the legs and overcoming resistance strongly and quickly in one way. states, "The use of (2-3) Weekly training units for various jumping and hopping exercises with one leg or with both legs, and running with jumping is ideal for developing explosive power." (Ibrahim, and Ali, 2013) [5]. The researcher attributes the reason for developing the explosive power of the arms to the inclusion of compound exercises on exercises represented in exercises of bending and extending the arms and pushing the ground with the hands, and intensifying the use of tools in compound exercises, such as throwing a medicine ball of different weights, taking into account their weights for the sample members, and taking into account intensity, size, and comfort in a regulated manner. This is what was confirmed by "Training to develop physical qualities must take place through codified training programs in terms of training volume, intensity, and loads in order to ensure reaching the goal and achieving development and balanced and effective development, so that the desired development and impact in these motor abilities appears. (Abu Zaid, 2005) [6]. Which led to the emergence of this significant improvement, which contributed to reducing the duration of muscle contraction and increasing the speed of performance, thus obtaining the maximum contraction and the highest force. This is what was confirmed by "The faster the contraction increases, the greater the growth of force, which increases muscle force." (Hassan, Suleiman Ali. (1983) [7]. In the test of force characterized by speed of the muscles of the legs (right and left), it is noted in the same table the mean differences between the results of the pre- and post-tests for the experimental sample in the three-hop test, as the results of the differences appeared significant, meaning that the applied compound exercises had a positive effect in improving the level of the sample in favor of the post-test. The researcher attributes the development of the force characterized by speed in the legs of the experimental group to the group of vertical and horizontal jumping exercises, which was emphasized during the use of compound exercises in performing them quickly, which included the training units that helped in this clear development confirms, "Force training requires High speed during exercises to obtain better motor performance during competitions (Abdel Fattah, 1992) [8].

The researcher believes that the reason for the development is due to the exercises used for the muscles of the legs, which were carefully prepared to affect the muscles working in jumping, especially when these exercises are based on sound scientific foundations in terms of taking into account the use of appropriate intensity and progression, using optimal repetitions and periods of rest, and their suitability for the

sample members.

As for the reason for the development of technical performance with shot put, from the results that appeared, we note that both groups obtained significant differences between the results of the pre- and post-tests, in favor of the post-tests for both groups. We can attribute a improvement that occurred for the two groups to the educational curriculum prepared by the researcher. The educational units contain a progression of movement and transition from easy to difficult, and emphasize: "The process of successful learning and training requires continuous practice, and to achieve this process, the importance of progression appears as an effective and influential factor in it, as the progression is difficult." Sports movements and skills, from easy to difficult, and from simple to complex, as it helps to understand, realize, and assimilate the movement or skill, and thus will gradually implement the vocabulary required in performance according to the learner's limits in his capabilities and functional abilities, which will have a positive impact on the level of learning." (Qasim Lazam *et al.*, (2005) ^[9] what was also confirmed by is: "Practice and exerting effort through training and continuous repetition are necessary in the learning process... as well as organized training by performing the skill according to simple educational steps and then gradually moving to increase the speed and force of performance." (Kamash, 2002) ^[1] "Focus on unclear matters and then prove this perception through practice and experience." (Mahjoub, *et al.*, 2000) ^[10].

Conclusions and Recommendations

Conclusions

- Combined educational exercises (physical-skills) contributed to developing the students' special force and technical performance (shot put).
- The coach program contributes to the development of the students' special force and technical performance, shot put.
- Combined educational exercises (physical-skills) have an advantage in developing the students' special force and technical performance (shot put).
- Performing the exercises in an interesting way increased the students' determination to develop the types of force and technical performance of shot put for the students.

Recommendations

- Necessity of applying complex educational exercises (physical - skill) prepared by the researcher for their impact on developing the types of special force and technical performance of shot put for students.
- Need for teachers to pay attention to developing special types of force because of their impact on the technical performance of students' shot put.
- Conducting research and studies similar to the rest of the activities that were not researched.

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