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The effect of an educational program on developing some kinetic abilities and technical performance achievements shot put for students

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Abstract

The purpose of this paper is to preparing an educational program to develop some kinetic abilities, technical performance, and performing shot put for students, and identify the impact of the educational program on developing some kinetic abilities, technical performance, and achieving shot put for students. The researcher used the experimental method (by designing two equal groups) for its suitability and the nature of research and experimentation. The research community was determined from the students of the first stage of the College of Physical Education and Sports Sciences, University of Al-Qadisiyah, for the academic year 2022-2023, amounting to (70) students. The research sample was chosen randomly. The sample was divided and distributed randomly (30) students using a lottery method into two groups for each group (15) student for the experimental group and (15) students for the control group. One of the most important results reached by the researcher is that: The effect of the educational program was positive in developing kinetic abilities, technical performance, and shot put achievement for students, and the repetition and diversity in the exercises used had a direct role in developing the students' kinetic abilities, technical performance, and shot put achievement. One of the most important recommendations recommended by the researchers is that: The researcher recommends applying educational exercises in learning as part of the curricula applications of physical education lessons, especially for beginner learners, and emphasis on studying kinetic abilities during the learning process due to their importance in identifying difficult stages.

Keywords: Educational program, kinetic abilities, technical performance and shot put

Introduction

Athletics is one of the games that base its development on other sciences, most notably kinesiology, biomechanics, kinetic learning, sports training, anatomy, and psychology. By employing these sciences, the level of technical performance for this event can be developed and an advanced level of achievement can be achieved commensurate with the mechanical requirements of the movement or skill to be studied. The advanced level of sports that the countries of the world have reached is the result of scientific progress in developing the level of performance and thus achieving achievement. The shot put event is one of the distinctive events in athletics (Throwing events), because they require the students' kinetic abilities and capabilities in addition to the technical aspects, they require that depend on the technical stages of performance. In addition, like other throwing events, the tremendous development in the level of digital achievement that developed countries have reached indicates to us that it is not possible to be satisfied. Depending on the methods used in the learning and training process for the student or teacher, the physical and technical capabilities of the players must be invested in addition to the use of sciences related to movement or skill, which seeks to use the correct rules for appropriate technical performance by evaluating the kinetic path of the performance and adjusting the performance correctly by detecting Sources of error in the kinetic path, by relying on the diversification of educational means and tools in the learning process and the nature of competitive performance of the event by focusing on the use of those auxiliary means. In addition, the shot put event has requirements for special kinetic and skill abilities. It requires kinetic exercises in order to improve the level of technical performance for the event.

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These exercises work to increase the skill and kinetic ability through the process of repetitions of these exercises, and then improve the level of technical performance with the help of assistive devices, and then the learning process becomes Better and more precise technique.

The importance of the research lies in the use of an educational program that facilitates the learning process and helps in applying the difficult and complex technical stages after dividing them in order to shorten time and effort to make the learning process more effective and positive. The development of kinetic abilities works directly to address the difficulty in some of the technical stages of this activity among the learners, as well as the effect using special educational exercises to learn the technical stages of the effectiveness of the shot put push for students to be a method used by teachers of track and field games.

Research problem

Through the researcher's practice and previous study of this event and her continuous follow-up in the learning curriculum and her acquaintance with scientific research and the methods used, the researcher noticed that the shot put event is one of the activities that is considered difficult due to dealing with a relatively heavy tool, which means the necessity of making precise use of the performance technique in a manner appropriate to its application. Scientific and practical, in a way that suits performance requirements and addresses errors. This results from the lack of use of educational exercises in the process of learning the complex or difficult technical stages of the effectiveness of the shot put push, and because some of the special educational curricula and lessons for learning the effectiveness of the shot put push do not rely on special educational exercises to a large extent or kinetic abilities are used to push the learning movement forward, keeping pace with global development. The researcher noticed that most physical education students do not apply an appropriate sliding distance, and most of them do not benefit from the throwing circle except half of it, leaving a large distance between the front leg and the stop board, and this condition is not treated. By giving information such as verbal feedback, but it requires the use of special educational exercises in processing and correction, so the researcher decided to study this topic to identify the extent of the benefit of using educational exercises in developing kinetic abilities in learning the effectiveness of shot put for students.

Research objective

- Preparing an educational program to develop some kinetic abilities, technical performance, and performing shot put for students.
- Identify the impact of the educational program on developing some kinetic abilities, technical performance, and achieving shot put for students.

Research hypotheses

- The educational program has a positive effect in

developing some kinetic abilities, technical performance, and achieving the shot put for students.

Research fields

- Human field: Students of the first stage of the College of Physical Education and Sports Sciences, University of Al-Qadisiyah, for the academic year 2022-2023
- Time field: (1/10/2022) to (1/2/2023)
- Spatial field: The private playground for the track and field lesson in the Department of Physical Education and Sports Sciences, University of Al-Qadisiyah.

Research methodology and field procedures

Research Methodology

The researcher used the experimental method (by designing two equal groups) for its suitability and the nature of research and experimentation, "which is a deliberate and controlled change of the specific conditions of an incident and observing and interpreting the resulting changes in the incident itself" (Mahjoub, 2000) ^[1].

Community and sample research

The research community was determined from the students of the first stage of the College of Physical Education and Sports Sciences, University of Al-Qadisiyah, for the academic year 2022-2023, amounting to (70) students. The research sample was chosen randomly. The sample was divided and distributed randomly (30) students using a lottery method into two groups for each group (15) student for the experimental group and (15) students for the control group.

Field research procedures

Determine the validity of some Kinetic abilities

The researcher reviewed specialized scientific sources and references to collect as much information as possible about special kinetic abilities and presented these abilities to the experts using a special questionnaire form to survey the opinions of experts to determine the validity of some kinetic abilities related to shot put, and Table (1) shows this.

Table 1: Shows the validity of some students' kinetic abilities

Abilities	Validity		Chi-2 calculated	Type sig
	Validity	Invalidity		
Agility	11	0	11	Sig
Kinetic compatibility	11	0	11	Sig
Kinetic precision	6	5	0.09	Non sig
Kinetic balance	11	0	11	Sig
Kinetic flexibility	4	7	0.81	Non sig

Determining the validity of Kinetic ability tests

For the purpose of determining the validity of tests for kinetic abilities, the researcher nominated a set of tests and presented them using a questionnaire to the (13) experts. After collecting the forms and transcribing the data, acceptance was made according to the chi-2 law, and Table (2) shows this.

Table 2: Shows the validity of the tests for kinetic abilities

Kinetic abilities	No.	tests	Validity		Chi-2 calculated	Type sig
			Validity	Invalidity		
Agility	1	Fleischmann zigzag running (by changing body positions)	5	8	0.69	Non sig
	2	Zigzag running using the Barrow method (by changing body positions)	13	0	13	sig
Compatibility	1	Throwing tennis balls at a wall 3m away for 30 seconds and receiving them (eye and arm compatibility)	13	0	13	sig
	2	Geometric shapes (eye and arm compatibility)	4	9	1.92	Non sig
	3	Numbered circles (jumping on circles) (eye and leg compatibility)	12	1	9.30	sig
	4	Jumping rope 20 seconds (eye and leg compatibility)	5	8	0.69	Non sig
Balance	1	Bass for kinetic balance (jumping on circles) movable balance	7	6	0.07	Non sig
	2	Moving over the marks (11) in a zigzag manner for a distance of 10 m (moving balance)	13	0	13	sig

Testing and evaluating the technical performance of the shot put event for students

- The aim of the test: to measure the level of technical performance for the shot put push event.
- Method of conducting the test: The student performs the technical performance of the shot put event, photographs the attempt, and presents it to experts to evaluate the technical performance. The student performing three attempts completes this test.

Shot put distance test (achievements)

- Objective of the test: to measure the shot put distance.
- Method of conducting the test: The test was conducted according to the international law for athletics competitions, that is, according to the law, where the student performs the technical performance stages of the shot put push event. After the performance, the shot put push distance is measured using a linen measuring tape. This test is done by the student performing three attempts, the best of which is counted as Achievement hand.

Exploratory experience

The researcher conducted her exploratory experiment on 10/10/2022 at ten in the morning on a sample of (6) students and from the research community itself. It included conducting tests on kinetic abilities and technical performance with a shot put and with the help of the assistant work team, and after 8 days had passed, the experiment was repeated on the individuals. The same on 18/10/2022 and its goal was:

- Identify the time it takes to perform educational exercises and the time it takes to take tests.
- Ensure the validity of the tools used in the field

experiment.

- Identify the appropriate number of assistants in conducting tests and implementing exercises.
- Extracting the scientific foundations for reliability and objectivity tests

Validity of tests

The researcher used content validity by presenting the tests to experts and specialists, who all agreed that the tests were valid.

Stability of tests

To calculate the stability coefficient of the selected tests, the researcher used the test and retest method to determine the stability coefficient, with a time interval of (8) days. The researcher extracted the reliability coefficient by using the Pearson correlation coefficient between the results of the first and second measurement, and all tests concerned with measuring kinetic abilities and performance level enjoyed a high degree of reliability.

Objectivity of the test

For the purpose of extracting the objectivity of the tests concerned with this research, the researcher used arbitrators to evaluate the results of the tests applied to the items of the exploratory sample, and then treated their results statistically by extracting the correlation coefficient (Pearson) to express the objectivity coefficient for each of the physical and kinetic tests included in the research. The results resulted in the high objectivity of the tests used in the research, because the values of the calculated correlation coefficients are high, as shown in the following table (3):

Table 3: Shows the reliability and objectivity coefficient of the tests used in the research

No.	Tests	Reliability coefficient	Objectivity coefficient
1	Zigzag running using the barrow method (by changing body positions)	0,92	0,90
2	Throwing tennis balls at a wall 3m away for 30 seconds and receiving them (eye and arm compatibility)	0,91	0,89
3	Numbered circles (jumping on circles) (eye and man compatibility)	0,90	0,91
4	Moving over the marks (11) in a zigzag manner for a distance of 10 m (moving balance)	0,92	0,90

Pre-test

The researcher conducted the pre-test after all conditions were available to conduct it on 26/10/2022, and it included testing special kinetic abilities, technical performance, and completing a shot put for the students, while controlling for all variables.

Procedures for sample homogeneity and equality of the two research groups

To complete the requirements of the experimental design, the

researcher verified the homogeneity of the members of the research sample in terms of height, weight, and chronological age using the test (skewness coefficient), in which the value of the significance level (sig) appeared greater than (0.05) for all tests, and this indicates homogeneity among the members of the research sample. As shown in Table (4).

Because the results of the skewness coefficient were all between (+1), the individuals in the research sample are homogeneous according to the mentioned variables.

Table 4: Shows the statistical parameters (arithmetic mean, standard deviation, median, and skewness coefficient for the variables height, weight, and chronological age)

No.	Variables	Measuring unit	Mean	Median	Std. Deviations	Skewness
1	Length	Cm	173,9	174	1,29	0,232
2	Weight	Kg	59,60	60	2,34	0,512
3	Chronological age	Year	18.2	18	0,6	- 0,288

In order for the researcher to attribute the differences to the experimental factor, the equivalence between the two research groups was conducted in the studied tests, as the appropriate statistical method represented by the t-test was used for

independent samples in which the value of the significance level (sig) appeared greater than (0.05) and for all tests, and this indicates the equivalence of the two groups. The research is as shown in Table (5).

Table 5: Shows the equality of the two research groups

Variables	Experimental		Control		T value Calculated	Level sig	Type sig
	Arithmetic means	Standard deviations	Arithmetic means	Standard deviations			
Zigzag running using the Barrow method (by changing body positions)	11.34	0.79	11.17	0.84	0.48	0.386	Non sig
Throwing tennis balls at a wall 3m away for 30 seconds and receiving them (eye and arm compatibility)	16.27	2.23	17.11	2.57	0.71	0.173	Non sig
Numbered circles (jumping on circles) (eye and man compatibility)	10.59	2.63	10.28	2.44	0.75	0.299	Non sig
Moving over the marks (11) in a zigzag manner for a distance of 10 m (moving balance)	4.40	0.88	4.50	0.79	0.43	0.176	Non sig
Achievement	2,95	0,17	3,24	0,20	1,90	0,130	Non sig
performance	30,33	3,78	36	2	2,29	0,084	Non sig

The achievement of students' shot put at a significance level greater than (0.05), which confirms the equality of the two groups in the variables under study.

Implementing the educational curriculum components

The main experiment included training the experimental group. It was trained with educational exercises from the start of the program (1/11/2022) until (30/11/2022) in some vocabulary of the main section of the educational unit, which was prepared by the researcher and with the following specifications:

- It was used at the beginning of the main part of the educational units.
- The experiment lasted (4) weeks.
- The total number of educational units reached (8).
- 1The number of weekly educational units was two.
- The duration of the exercises was (30) minutes for the educational unit.

These exercises were prepared in a scientific way to benefit from them in developing special kinetic abilities. These exercises were diverse in order to benefit from them more and to create a spirit of excitement and suspense. The researcher

took into account the level of the sample in these exercises, as the speeds he used were consistent with the difficulty and ease of the exercises, and these divisions it helped a lot in applying the exercises.

Post-tests

The post-tests were conducted for the two groups of the research sample, which numbered (30) students, on (2/11/2022) in the same place where the pre-tests were held. The researcher was keen to establish the same conditions that were used in the pre-test in terms of time, place, tools used, method of implementation, and the supporting work team. .

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

Results and discussion

Results

Presenting the results of the pre and post-tests for the Kinetic ability tests and for the technical performance and achievement variable for the shot put effectiveness of the (control) group and analyzing them

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 control group

Variables	Pre-test		Post-test		T value Calculated	Level sig	Type sig
	Arithmetic means	Standard deviations	Arithmetic means	Standard deviations			
Zigzag running using the barrow method (by changing body positions)	11.17	0.84	10.07	0.82	2.26	0.000	Sig
Throwing tennis balls at a wall 3m away for 30 seconds and receiving them (eye and arm compatibility)	17.11	2.57	19.53	2.16	3.13	0.000	Sig
Numbered circles (jumping on circles) (eye and man compatibility)	10.28	2.44	9.12	1.62	1.97	0.000	Sig
Moving over the marks (11) in a zigzag manner for a distance of 10 m (moving balance)	4.50	0.79	5.70	0.60	3.19	0.000	Sig
Achievement	3,24	0,20	5.38	0.40	3.75	0.000	Sig
Performance	36	2	39	1.79	4.59	0.000	Sig

Table (5) 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. Therefore, the researcher used the t-test for correlated samples. The calculated t-values appeared significant for all tests because the value of (sig) is less than

the level Significance (0.05) and therefore there is a preference for post-tests.

Presenting the results of the pre- and post-tests for Kinetic ability tests and for the technical performance and achievement variable for the shot put activity for the (experimental) group and analyzing them:

Table 6: 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			
Zigzag running using the barrow method (by changing body positions)	11.34	0.79	8.88	0.62	4.69	0.000	Sig
Throwing tennis balls at a wall 3m away for 30 seconds and receiving them (eye and arm compatibility)	16.27	2.23	22.40	2.30	8.25	0.000	Sig
Numbered circles (jumping on circles) (eye and man compatibility)	10.59	2.63	8.10	0.86	4.20	0.000	Sig
Moving over the marks (11) in a zigzag manner for a distance of 10 m (moving balance)	4.40	0.88	7.30	0.44	6.10	0.000	Sig
Achievement	2,95	0,17	8.11	0.79	6.77	0.000	Sig
Performance	30,33	3,78	45.11	1.59	12.19	0.000	Sig

Table (6) 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 between the two tests. Therefore, the researcher used the t-test for correlated samples. The calculated t-values appeared significant for all tests because the value of (sig) is

less than the level Significance (0.05) and therefore there is a preference for post-tests.

Presentation of the results of the post-tests for Kinetic ability tests and for the technical performance and achievement variable for the shot put effectiveness for the two groups (experimental and control) and their analysis

Table 7: 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			
Zigzag running using the Barrow method (by changing body positions)	10.07	0.82	8.88	0.62	3.85	0.000	Sig
Throwing tennis balls at a wall 3 m away for 30 seconds and receiving them (eye and arm compatibility)	19.53	2.16	22.40	2.30	7.29	0.000	Sig
Numbered circles (jumping on circles) (eye and man compatibility)	9.12	1.62	8.10	0.86	2.55	0.000	Sig
Moving over the marks (11) in a zigzag manner for a distance of 10 m (moving balance)	5.70	0.60	7.30	0.44	4.96	0.000	Sig
Achievement	5.38	0.40	8.11	0.79	4.47	0.000	Sig
Performance	39	1.79	45.11	1.59	9.40	0.000	Sig

Table (7) 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, we see that they are different between the two tests. Therefore, the researcher used the t-test for independent samples. The calculated t-values appeared significant for all tests because the value of (sig) is less than the level Significance (0.05) and therefore there is a preference for the experimental group.

Discussion

Through the above-mentioned presentation and analysis of the previous tables, it is clear that there is a development of kinetic abilities, technical performance, and achievement by pushing shot put students to the control and experimental group. The researcher attributes the development of the control group to the influence of the regular curriculum set by the coach, in addition to the continuity and regularity of the players in training, which had a clear role in Development of kinetic abilities. As “The opinions of experts, no matter how different the sources of their scientific and practical culture, are that the training program inevitably leads to the development of achievement, if it is built on a scientific basis in organizing and programming the training process, using appropriate intensity and progression, and observing individual differences, as well as using optimal repetitions and effective inter-rest periods and under supervision.” Specialized trainers under good training conditions in terms of space, time and tools used.”(Ismail, 1996) [2]. The results also showed that there were significant differences and preference

for the experimental group in the development of kinetic abilities, technical performance, and achievement by pushing shot put for students, and this difference came as a result of the application of educational exercises, as we find that these exercises included many repetitions of pushing for the technical stages of the effectiveness of pushing shot put and in various situations, especially the slide and confrontation stage. To push and push, and thus the process of pushing the weight is better by facing the student’s body to the throwing sector. “Putting the shot put thrower’s foot on the ground will speed up the movement of the upper part of the body compared to the lower part, but at the same time it works to slow down the movement of the combined center of the shot put of the learner’s body and the shot put in his hand” (Hussein and Al-Talib. (1997) [3].

We find that all the abilities under research recorded a good rate of development, and the researcher attributes the development in abilities to the extent of the effectiveness of using the exercises of the educational program prepared by the researcher, which led to an increase in the students’ ability. The researcher attributes the reasons for these differences to the following:

1. The scientific application of the exercises that were included in the educational program, which indicates the importance of these various exercises in developing some of the important kinetic abilities that the student needs in pushing the shot put, and this is what was indicated by “To develop the player’s compatibility, one must gradually increase This general, simple and easy kinetic ability (compatibility) is then compounded at the stage of

starting practice or the establishment stage.” (Mowafi , 2010) ^[4], states, “The process of organized training works to regulate and improve neuromuscular compatibility processes in order to achieve regulation of the work of kinetic units, accurate estimation of the resistance facing the muscle, and mobilization of the appropriate number of kinetic units that participate in muscle contraction.” (Abdel Fattah, and El-Sayed, 2003) ^[5]. Repeating the exercise and giving sufficient time to explain and perform it helps the player to fully understand the details of the entire movement. This was confirmed by “Feelings play an important role in the kinetic compatibility of the skill and the compatibility between the muscular and nervous systems, which provides a sense of effort and resistance when performing the skill, and learning about processing contributes to the ease and flow of the kinetic performance of the skill.”(Jassam , and Kazem, 2009) ^[6].

2. The researcher attributes the development in (balance) to the exercises, as the differences shown above demonstrate the effectiveness of the curriculum items and the various kinetic activities it included that helped develop this characteristic, in addition to the researcher’s consideration of the principle of progression and repetition and helping them draw joy on their faces by instilling joy. Due to the importance of this characteristic, its development is considered “the most important element of learning movement, and without it, it is difficult to perform transitions, locomotion, and control movements. In general, student athletes and primary school students who practice various movements and are placed in different movement situations can develop balance abilities with little difficulty, unlike those who do.” Students who are not exposed to different movement situations and do not practice multiple types of movements. In addition, the quality of balance develops with training and also improves with increasing age. (Majeed, 2000) ^[7].
3. The researcher attributes the development in (agility) to the program’s exercises, as well as the progression of exercises from easy to difficult, and this was confirmed by “The more agility an individual increases, the faster he can improve his level, provided that we do not forget the basic educational principle of gradation from “The simple to the complex, as the individual must analyze it into its simple components.” (Khaleq, 2005) ^[8]. The implementation of exercises in the educational program, which is based on a gradual basis in training, has led to the development of kinetic abilities, and this is consistent with what was indicated by “Movement develops through regular sports training as a result of the development of the mental and intellectual level and the development of kinetic qualities, in addition to increasing what A storehouse of kinetic experiences in the brain. (Mahjoub, 1987) ^[9].

Conclusion and Recommendations

Conclusion

- The effect of the educational program was positive in developing kinetic abilities, technical performance, and shot put achievement for students.
- The repetition and diversity in the exercises used had a direct role in developing the students’ kinetic abilities, technical performance, and shot put achievement.
- Taking into account individual differences during the implementation of the educational program was

important in developing the students’ kinetic abilities, technical performance, and shot-put achievement.

- Choosing exercises in a way that suits the learning law (from easy to difficult) helped develop kinetic abilities, technical performance, and achievement by pushing shot put to students.

Recommendations

- The researcher recommends applying educational exercises in learning as part of the curricula applications of physical education lessons, especially for beginner learners.
- Emphasis on studying kinetic abilities during the learning process due to their importance in identifying difficult stages.
- Conducting studies on the kinetic and skill abilities of different games and other samples.

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