



Effectiveness Of Educational Package To Learn And Improve Javelin Throw Performance And Achievement For Female Students

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Abstract

Javelin throw is a fundamental skill in physical education curricula, combining muscular strength, motor coordination, and precise technique. Despite its importance, many female students face difficulties in acquiring this skill due to a lack of individual guidance and structured training. This study aims to enhance quality of teaching in physical education colleges by presenting a distinguished teaching model, providing empirical evidence of effectiveness of educational packages in teaching complex motor skills, and improving students' physical fitness and muscular strength, thereby contributing to raising their overall athletic performance. The researcher used an experimental method with a two-group equivalent design using pre- and post-tests, as it is suitable for nature of problem being addressed. Research community consisted of first-year students at Faculty of Physical Education and Sports Sciences, Al-Muthanna University, during 2022-2023 academic year, total number of students was 120, distributed across six classes, sample was selected from first-year female students in two classes (A and B). Male students were excluded, as the research focused solely on female students. A limited number of students were selected to ensure equivalence of sample, resulting in a final sample size of 25 female students. Results showed significant differences between pre-test and post-test scores in all tests, favoring post-test scores, there were significant differences in post-test scores favoring experimental group, teaching using educational package, with its various tools and methods, contributed to improving learning of javelin throw and enhancing physical abilities associated with event, use of educational package was more effective than traditional physical education teaching method in teaching and improving technical performance and achievement of javelin throw among research participants.

Keywords: educational package; javelin throw; technical performance; athletic achievement; female students.



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Introduction

As is the case with other educational science disciplines in the field of physical education, teaching methodologies have become an ever more popular area of scientific interest and theory. This continued scholarly interest has made such methodologies become a systematic and organized form of discipline, a discipline that acts as a fast medium through which all new developments in the teaching methods can be assimilated and utilized, and at the same time leads to the identification of new ways of teaching. Consequently, teaching methodology has become a separate applied science with its own methodology, philosophy, theoretical base, and curriculum designs- aspects that collectively have become a core element of the teaching process in most modern day-schools.

With such a rapid rate of growth, the role of the teacher needs to be necessarily modified in a way that will continue to keep pace with this growth, as the teacher is one of the key elements of the entire educational process. University preparation, along with the ongoing qualification of the profession, is a successful and effective approach to improving the efficiency of pedagogy and mobilizing practical teaching skills. The learner, in his/her turn, is still the focal point and the main support of the educational business, and the learning process itself is an urgent need predetermined by new scientific changes and transformations. This situation predetermines the introduction of certain teaching techniques based on the modern trends in the functioning of the education system, techniques that react to the actual developmental requirements of students and help to increase not only their general achievements but also their physical and motor skills in a variety of sporting events. The most noticeable of such activities are track and field events, which take a prime place among the sporting activities and are known as the bride of the Olympic Games due to the variety of events that they involve.

Javelin throw is one of the most important skills of physical education programs, which entails a complex of muscular strength, motor skills, and technical accuracy. Despite the importance it has been given, many female students face considerable problems with the acquisition of this skill, which is in large part due to the lack of personalized instructional guidance and properly designed training courses. Against this background, recent studies have become more and more oriented towards the application of an educational package, conceived as a synergized combination of theoretical resources, visual aids, and practical instructional resources, as a process of motor learning.

The current research aims to explore the effects of this kind of an educational package on the performance and achievement level of first-year female students in the event of javelin throwing. The importance of the research can be summarized as follows: the research can contribute to increasing the quality of instruction in colleges of physical education, by offering a unique pedagogic model; the study will provide empirical support concerning the effectiveness of the educational package in helping learners acquire complex motor skills; the research will help improve the level of physical fitness and muscular strength, among female students, which in turn will lead to an overall increase in the level of athletic performance;



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the study will also be helpful in terms of contributing to the curriculum development, in terms of introducing modern instructional methods, which will be used by the teacher; the study will also aim to measure the effect of the educational package on increasing the distance in javelin throwing; the study will also attempt to measure the effect of the package increase in the level of technical/artistic performance in the given activity; and the research will also attempt to draw a comparison between the results of an experimental group taught using the package, and those of a control group taught according to the traditional approach adopted by the teacher.

Having had himself an experience in teaching the subject of track and field, the researcher came to the realization that most of the students majoring in physical education and sport sciences are faced with a lot of difficulty in learning the javelin throw- especially with regard to the attainment of smoothness in the approach run, and to the correct execution of the crossover step without hindering the succeeding stages of the movement- which follows. After studying the traditional and modern approaches and strategies to teaching, the researcher was triggered to come up with a concept that focused on creating a model teaching setting that could produce positive results during instructional lessons, which was accomplished by using the educational package. It is so relevant especially because it may be actually hard to get the right distance and height in the throw and success in this respect gives good payoff to the learning process on the whole. Modern methods of learning, further, depend upon the stimulation and utilization of the entire gamut of senses of the student, and this is achieved by the way of the application of diverse instructional media, which can appeal to more than one sense at a time--media which serve an effective purpose to vitalize the learning experience, and which help to increase and strengthen the desired educational influence. It was found that weaknesses in the basic method of the javelin throw, along with a lack of the muscular strength necessary, are the common weaknesses in the students, and both have a detrimental effect on student performance during practical exams. To give immediate feedback about performance as well as to develop the dynamic and responsive learning environment, the researcher therefore chose to embrace an educational package to facilitate this activity.

The research hypotheses can be as follows: statistically significant differences between the two groups exist in terms of medicine ball throwing test, in favor of the experimental group; statistically significant differences exist in terms of the distance achieved in the javelin throw, in favor of the experimental group; students in the experimental group achieved higher scores in terms of the practical test than their counterparts in the control group.



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Research Methodology

The adopted research methodology was the experimental approach utilizing a two equal group pre-test post-test design as it was determined that this study design was ideal in the context of the nature of the issue being investigated. This decision can be explained by the fact that the experimental approach is commonly considered to be the most effective and the most strict way of solving a range of scientific issues, both practically and in a theoretical perspective.

Table 1. Design shows two equivalent groups with pre-test and post-test

Group	Pre-test	Field procedures	Post-test
Experimental group	1-Performance 2- Achievement 3- Throwing medical ball	Educational package	1-Performance 2- Achievement 3- Throwing medical ball
Control group	1-Performance 2-Achievement 3- Throwing medical ball	Method used by teacher	1-Performance 2-Achievement 3- Throwing medical ball

Research Community and Sample

Choosing a proper approach to a research problem is one of the key steps that precondition the successfulness of the research project since the scientific method can be defined as a way of thinking and a way of working on which the researcher will rely to organize, analyze, and present ideas, and then to make reasonable conclusions and facts about the phenomenon under study. Based on this interpretation, the researcher embraced the experimental approach, as far as it is considered as an effort to bring about control over the situation under study with the only exception of the variable, or a group of variables, assumed to cause a certain change in that situation.

The target population was considered to be the first-year students of the Faculty of Physical Education and Sports Sciences, Al-Muthanna University, in the context of the 2022/2023 academic year, totaling 120 students spread across six academic sections. In the frames of experimental scientific research, the sample selection is considered to be essential, and the sample is understood as the model which is going to be examined or observed and on which the experimental process is going to be held; the sample can include one person, two persons or a group of persons. In the current study, the sample was selected among first-year female students of two academic sections (named A and B) and, more specifically, the researcher avoided male students because the research was focused solely on female students and only a limited number of people could ensure equivalence of the members of a sample of female learners. The total number of female students that formed the sample was 25.



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Study tests

Javelin Throw Test - Achievement and Technical Performance: This test has a twofold goal: to check the distance covered by the student, and to check the level of performance according to the judgment of the panel of experts who are present during this test.

Performance specifications: All the students will get three attempts, with the highest being counted.

Measurement tools and devices: the javelin shaft, in combination with a measuring tape.

Mode of registration: the score obtained by the student is the distance covered in a successful, valid attempt.

Medicine Ball Throw: purpose of test is to measure muscular strength of upper body. Performance specifications, player stands behind starting line and holds medicine ball, test subject throws medicine ball forward with maximum force using shoulder and arms without moving feet for the longest possible distance. Tools and equipment used in measurement: Medicine ball weighing 3 kg., measuring tape, throwing sector. Recording method: distance ball travels is recorded for test subject. Note: When throwing medicine ball, feet must remain stationary and not move. Each player has three attempts, and the best one is recorded.

Pilot study

The pilot study is a replica of the main experiment, but in a smaller scale and, to the best extent possible, it needs to meet the same conditions and situations that define the main experiment otherwise it will not be valid. In line with this, the pilot study was conducted on February 1, 2023, with a sample of five female students who were randomly selected through a systematic random sampling tool and were part of the research community. The key purpose of this pilot study was to predetermine the challenges that the researcher may face, with a specific focus on the following aspects: determining the level of readiness of the sample to complete the tests; identifying the necessary time to complete the tests; assessing the appropriateness of the tests to the sample in question; and being familiar with the devices and tools that will be used.

Pre-test

Testing is a way of appraisal, quantification, diagnosis and suggestions in the different curriculums, programs and plans that are considered to all levels of education and all age groups, which makes it clear that there is an indication of the level of progress that is being made and that the level of success that is being sought in achieving the desired goals has been achieved. Training, after the two introductory training units, devoted to explaining the performance stages of the javelin throw, and spanning one week, the remaining training involved explaining



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how to complete the approach run, the distance needed to complete the approach run, and the technique of running with the javelin over the shoulder, and the technique of withdrawing the javelin, bending the body, cross-legged posture, assuming the throwing position, and performing the throw, as well as attaining an optimum distance. The pre-test was later conducted on Sunday, 5 February 2023 at 10:00 AM, at the stadium of the Faculty of Physical Education and Sports Sciences, Al-Muthanna University. The pre-test contained the following elements: in terms of the application of the achievement activity, every student was given three opportunities, the maximum distance of which among the three was counted; in terms of performance assessment, the evaluation of the learning was carried out by a panel of the experts that were located close to the throwing sector and in terms of which, the students were given a rating on the performance across the different stages of the activity. A total of three attempts was made.

Educational approach

The learning model involved ten teaching units, as well as two introductory units which were taught at two educational units per week, with each educational unit taking 90 minutes. The preparatory part of every unit tended on average to be over 23 minutes, with three parts: an introduction 3 minutes; a general warm-up, 8 minutes, which was a variety of exercises to prepare the different parts of the body; and a specific warm-up, 12 minutes, consisting of a variety of exercises directly connected with the main part of the lesson. It was further subdivided into two major parts: an educational part, which lasted 15 minutes, during which explanations were given about the use and application of the educational package, about the requirements needed to ensure ideal performance of the activity, which were drawing on video footage and images illustrating the various stages of the activity; and a practical part, which lasted 45 minutes, during which the assistive tools that constituted the requirements of the activity were put into practice. The final part of every unit took 7 minutes and was interspersed with recreational activities with a general cooling-down of the organism as well as a final greeting that denoted the end of the session.

Post-tests

After completing the ten units of the approach, which included the post-test, the sample took the test on March 19, 2023, a Sunday, at 10:00 AM, in the Faculty of Physical Education stadium, Al-Muthanna University. The same conditions as those of the pre-test were followed in terms of timing, location, the assisting staffs involved, the tools and equipment used and thus the extraneous variables were as much as possible controlled. Three legal attempts were granted to each student in the sample with regard to both performance and achievement. The post-test also included the following aspects: in respect of the use of the javelin throw achievement activity the student was given three trials whereby the highest distance



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reached in the three attempts was considered and the performance of the student in the various stages of the activity was rated by a panel of experts who were standing close to the throwing area and the scores were given depending on performance of the students in the different stages of the activity. A total of three attempts were made.

Results and Discussing

After applying proposed methodology, conducting tests, and obtaining results, they were statistically analyzed.

Table 1. Arithmetic means, standard deviations, and (t) values and their significance between pre- and post-tests of variables for control group

Variables	Measurement unit	Pre test		Post test		Calculated (t) value	Sig. level
		M.	St.d	M.	St.d		
Javelin throw (achievement)	Meter	14.10	1.10	15.30	1.18	3.46	Sig.
Javelin throw (performance)	Degree	6.18	0.85	6.95	0.89	3.21	Sig.
Medicine ball throwing	Meter	4.12	0.46	4.38	0.49	2.92	Sig.

Value of (t) is 2.797 at a degree of freedom of 24 below significance level 0.05

All results in Table 1. show statistically significant differences between pre-test and post-test for control group, in favor of post-test for variables under investigation, calculated (t) value is greater than tabular (t) value at significance level (0.05) at freedom degree 24 and an amount of (2.797).



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Table 2. Arithmetic means, standard deviations, and (t) values and their significance between pre- and post-tests of variables for experimental group

Variables	Measurement unit	Pre test		Post test		Calculated (t) value	Sig. level
		M.	St.d	M.	St.d		
Javelin throw (achievement)	Meter	14.20	1.15	18.45	1.22	10.12	Sig.
Javelin throw (performance)	Degree	6.25	0.88	8.70	0.91	9.45	Sig.
Medicine ball throwing	Meter	4.15	0.44	5.02	0.51	8.74	Sig.

Value of (t) is 2.797 at a degree of freedom of 24 below significance level 0.05

Table 2 shows that the results of the pre-test and post-test of the experimental group have statistically significant differences, with the post-test results being higher in relation to the variables being tested. This is supported by the fact that the calculated t-value is greater than the tabulated t-value in a significance value of (0.05) and the degree of freedom of 24, the tabulated value in this case is (2.797).

In regards to the discussion of results related to both the control and experimental group, the results showed statistically significant differences between the pre-test and post-test results, in both instances, the differences favored the post-test. The researcher owes this to the application of the educational package, which was seen as a proper means of teaching the javelin throw in the context of the learning education curriculum. In the case of the experimental group, in particular, it entailed using the instructional materials included to the package, such as the accompanying video footage and images, which had been thoroughly adjusted to the level of the student sample. The practice that the student sample took during the learning period helped to improve the abilities of the students, develop their competition spirit and their general performance in the event. In a similar vein, the control group, which likewise followed the same instructional method, exhibited a tangible and positive impact with respect to the technical aspects of the javelin throw. It was mirrored in both the experimental and the control group in terms of a higher performance level in terms of the kinetic technique that the activity of javelin throwing was based on and demonstrated in the post-measurement.



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Table 3. Significance of differences between post-tests of the groups

Variables	Measurement unit	Control group		Experimental group		Calculated (t) value	Sig. level
		M.	St.d	M.	St.d		
Javelin throw (achievement)	Meter	15.30	1.18	18.45	1.22	9.28	Sig.
Javelin throw (performance)	Degree	6.95	0.89	8.70	0.91	8.47	Sig.
Medicine ball throwing	Meter	4.38	0.49	5.02	0.51	5.21	Sig.

Value of (t) is 2.011 at a degree of freedom of 48 below significance level 0.05

These outcomes of the post-tests of both experimental and control groups were determined to be greater than the tabulated value of (2.011) which is calculated at degree of freedom of (48) and significance level of (0.05). The implication of this finding is that there are strong differences between the two groups with the differences leaning in favor of the experimental group in all the variables of interest. The researcher explains the emergence and growth which was witnessed in all the variables which are directly related to the motor performance as being due to the effectiveness of the educational package used and the growth is one clear indication of the motor performance being improved in both artistic and technical aspects. The effect of this was supported with the help of the educational package, as well as the methods and means supporting it, such as watching images and videos of the motor presentation of the performance of the activity, which provided students with a sufficient opportunity to master the technical stages of the activity and the subsequent stages with a high level of motivation in order to increase the performance and achieve higher levels of accomplishment in the activity. A positive change in physical skills was also noticed, one that resulted in an expansion of opportunities in performing applied exercises and the number of repetitions, thus increasing the likelihood of success and maximizing the use of actual time spent on performing the skills. In this connection, it has been observed that the increase in time which is actually devoted to skill performance results, in its turn, in the increase of physical abilities. Moreover, correction of the mistakes that were related to performance helped in building the capacity of the members of the experimental group to properly utilize the body parts involved in performance to achieve the intended purpose of the performance. This is in line with what was verified by Khairiya which is that the application of educational methods and techniques that have a direct effect, which is the methods that are chosen based on the type of weakness or defect that is existing in performance i.e. the



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developmental intervention would be based on a particular type of defect, would help to improve performance.

Findings discussion

The presence of statistically significant differences between the pre-test and the post-test results is shown in Table 1. The control group was exposed to the procedure implemented by the professor in the teaching of the effectiveness of the javelin throw and the researcher explains these variations by the explanatory method that helped in understanding and cognition of the activity. This has been done by a clear and logical sequence in illustrating the stages of the technical javelin throw, which has been supported by some scientific sources and further explained in Table 2. Significant differences between the pre-test and post-test outcomes of the experimental group, who were exposed to the educational package of illustrative techniques and aids, i.e., images and videos of each phase of the activity movement in minute detail, were also found statistically significantly. As mentioned above, the use of illustrative images in the curriculum, as well as showing live demonstrations of the activity allowed learners to comprehend and comprehend the nature of the movement involved. Additionally, the fact that the sample was included into certain exercises depending on the number of repetitions that the sample did in the set educational units in the curriculum also led to the rise in the number of technical performance skills acquired.

The success of the javelin throwing, as well as the process of acquiring some physical skills related to it was shown with the help of these educational devices and videos which gave the students a sufficient chance to get the feedback, thus, being able to master motor skills they need to perform in the event and be able to learn and develop their performance in the post-tests. The researcher explains the importance of these differences by the positive learning strategy adopted, as the application of the educational package, its different tools and techniques was effective in promoting creativity in the students during the lesson. Table 3 shows clearly that there are statistically significant differences between the post-test results in which the research group has an outcome in favor of experimental group. The researcher explains the importance of these differences by the fact that the implementation of the educational package, along with its tools and methods, played a vital role in arousing the enthusiasm and motivation of students to further learn. It also enabled students to get feedback in the form of images and videos, thus being able to attempt more activities compared to the other methods. This, on its part, led to the formation of physical aspects of the process due to the further repetition of the skill-based exercises, as the speed of muscular action is directly associated with the intensity of the stimuli involved, which is intensified by the gradually increasing loads of training and the directly proportional acceleration of muscular contraction speed.

Conclusions

Statistically significant differences were observed between the pre-test and post-test results of all the tests studied, in both the control group and the experimental group, and these



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differences were always in favor of the post-test results. Secondly, when the two groups were compared to each other, there were also significant differences in the post-test results and in this case, the comparison favoured the experimental group. The educational package, along with the tools and methods it involved, helped to enhance the learning of the javelin throw, as well as to improve the physical skills involved in the event among the participants. Moreover, the educational package together with the tools and approaches to teaching it turned out to be more productive than the method traditionally used during the physical education lesson, not only in the respect of helping the participants to learn and improve their technical performance of the javelin throw but also in the respect of raising the overall level of achievement achieved by the participants.

Recommendations

There is a need to focus on introducing a more modern approach, represented by the educational package, in teaching the javelin throw—particularly with respect to female students—as well as in athletics events more broadly, across the various age groups. It is also necessary to carry out additional research that utilizes dissimilar approaches to learning with an aim of instructing and developing the degree of technical performance within the javelin shot. This involves balancing educational curriculums based on various indicators and techniques, including the educational package and its structural parts found to trigger the enthusiasm of students, and consequently their interest in learning. This methodology gives students more chances to receive feedback and allow more attempts to complete the assignments that are assigned to them than other practices, which has had a positive impact on their performance and their degree of achievement. It is also suggested that, such research and studies should be done regarding other age groups, in addition to other sporting games and events.

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