

## Impact of Blended Learning Utilizing Modern Technologies to Learn and Improve Discus Throwing for Students

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### ABSTRACT

**Backgroud:** This research aims to examine the effect of blended learning method using current educational technologies on the learning process and improvement of discus throwing skill of second year students (experimental group). It also attempts to determine how technology-based blended learning affects learners compared to the effect of the traditional teaching method normally used by the course teachers (control group) by comparing the learning outcomes and performance levels of both learners. **Methods:** In order to meet these goals, the researcher used the experimental method, which is the most suitable method because it allows the researcher to control the variables and generate a cause-effect relationship between the independent variable (blended learning approach) and the dependent variable (the level of performance of discus throwing). The subjects of the research were divided into four academic sections comprising 110 second year students studying at College of Physical Education and Sports Sciences, Al-Muthanna University for the 2021-2022 academic year. A sample of six academic sections (A, B, C, D, E, and F) was selected for the research. Twenty-eight students were randomly selected in a lottery to place in Section D. Subsequently, the researcher narrowed down the sample so those in the sample had homogeneity and equivalence on the relevant variables (such as age, height, weight and prior skill) with the others being excluded. Thus, the final number of students was 25 students, who were randomly divided into two groups: students who were taught using modern technologies (experimental group) and students who were taught in the traditional manner as applied by teachers (control group). **Results:** Based on the research findings, it was found that the blended learning method using modern technological tools was more positive and effective to increase the students' performance in discus throwing compared to the traditional learning method. Moreover, the results showed that the effect of the technological tools and techniques applied in the educational curriculum was clear and tangible on the learning outcomes of the students at the College of Physical Education and Sports Sciences. **Conclusions:** This was manifested in the enhancement of physical abilities and neuromuscular coordination of the students and was translated into high level of achievement and technical actions of students' throwing at discus among the members of the research sample.

**Keywords:** Blended Learning, Modern Technology, Discus Throwing, Students.

## INTRODUCTION

Many countries have achieved high educational standards, thanks to the amazing scientific advances that have taken place in recent years and all over the world. This progress can be clearly seen in sporting accomplishments of the pupils in many Sports (Hu, 2021; Yang, 2025). For this reason, it is imperative that a variety of and modern teaching methods and approaches be used to

achieve advanced levels of performance. Therefore, greater emphasis should be placed on specialisation in education through education based on specific requirements in each sport. One of the fundamental principles that support the achievement of the main goal of the educational process the high level of performance in various sports and events, including the various branches of athletics, is considered educational specialization (Adizov et al., 2024; F. Cao et al., 2022; Yu, 2021).

Learner is the main subject of the educational process, and his skills are one of the main purposes of the educational process. For this, it is important to consider different educational situations conducive to learning and enable learners to experience optimal functioning in different sports. These can also be used to help learners grasp the different components of a skill or a movement, and recognise how these components are linked (Farias et al., 2019; Fathir et al., 2025).

The discus throw is one of the unique events in sports and involves particular motor and physical skills of the throwers. The growth of developed throwers shows that level 4 throwing skills are hard to attain using only classical methods, just as it is in other throwing events. Rather, they need to employ a number of contemporary concepts and technologies. Hence, the diversity of educational techniques, and the use of modern technologies in education are important factors for improvement of the learning process (Dinu et al., 2019; Waller et al., 2014).

The application of modern technology to the process of education no longer is a secondary education issue, but is a necessary component of the contemporary teaching process. The use of modern technologies can help in making the educational process effective and positive by taking part in improving the physical and motor skills necessary for a specific sport. The power of working muscles is a key factor in the discus throw. Accordingly, muscular strength has been regarded as one of the most significant physical capabilities among which contribution to performance and merit for achieving advanced performance has gained interests from researchers, leading to a great deal of attention being given to its development (Y. Cao, 2022; Chen, 2016; Liu & Xie, 2024).

The learning process is the transfer of information from teacher to learner and the method of teaching/learning used is appropriate to the student's learning style. The better the method to the learner and the skill, the more effective and efficient the learning process (Chen, 2016). Teaching approaches and learning styles have changed significantly, but much of the educational context relies primarily on verbal explanation and modelling. Sometimes this technique does not present the option to make learning more interactive and effective (Fidalgo-Blanco & Sein-Echaluze, 2014; Sarin et al., 2021).

The researcher thinks that using verbal explanation and conventional exercises is not enough to give students opportunities to display their competency. Moreover, the long explanation might cause boredom and decrease the concentration of pupils, especially during the process of learning, which would not lead to the expected learning outcomes. Thus, more suitable teaching methods are needed that could help to achieve better learning, along with an improvement of motor performance.

The researcher noted during the research that there were some problems for many students of physical education in learning the discus throw technique especially in making the technical phases smoothly and linking between the various phases of discus throw properly. Based on the development of both traditional and modern educational methods, the researcher developed the idea of creating an integrated educational environment through the use of blended learning and modern technologies. This could offer suitable learning opportunities within lessons and help to enhance learning through using multiple senses.

#### Research Objectives

This research is designed to find out the influence of blended learning with modern technology on learning and improving discus-throw performance of the experimental group. It is also intended to identify the differences between the effect of using the modern technology in

blended learning and the method being used by the instructors on the improvement of discus throwing performance of the experimental and control groups.

#### Research Hypotheses

The pre-test/post test analysis of the discus throw performance of the control and experimental groups showed that there were statistically significant differences favoring the post test. Statistically significant differences in favor of blended learning with modern technologies are also observed with regard to learning and improving one's discus-throw performance compared with that of the teaching of instructors.

## METHODS

One of the best methods for acquiring scientific information about a research problem is the experimental method, because through it the researcher is able to observe the events, control the study conditions and determine the implications of what he or she is seeing. The types of research goals and the methodology a researcher uses dictate the types of population and sample chosen for the study.

The research population was students of the second year in the College of Physical Education and Sports Sciences, Al-Muthanna University during the academic year (2021-2022). Total students = 110, across the academic sections. Sample is the group to which experimental observation, measurement, and experimental operations are performed in scientific experimental research. Sample consisted of second year students of the academic sections (A, B, C, D, E and F). Twenty eight students were randomly chosen by lottery from 80 to form Section D. The researcher, therefore, removed a number of the students to insure greater homogeneity and equivalence among the children and young people. Thus, the final sample of this research was 25 students.

#### Study Tests

Test Name: Discus Throw - Effectiveness (Achievement and Performance). The main aim of this test was to determine the distance thrown by each student by the discus and to compare the technical performance by the experts who were present in the test.

Performance Specifications: Three trials were allowed for each student and the best valid trial taken. Applies the following tools and devices: A measuring tape was used to measure distance. Recording Method: The distance the test participant scored in the best valid attempt was recorded, along with the evaluation of technical performance.

#### Pilot Study

The pilot study was split up into a study that was performed on the 8th of February 2021. It was done to make sure that the procedures that were set up for the main experiment were suitable and that they could be put into practice. The objectives of the pilot study were to seek to: Establishing the time needed for the teaching method. Recognizing appropriateness and validity of devices and tools used. Knowing and eliminating potential mistakes in the actual experiment. Making sure that the area chosen for the main experiment is appropriate. Introducing the assisting personnel to the nature of the job and the action to take.

#### Pre-Tests

Two educational units were implemented and the pre-tests were carried out with the research sample on 15/2/2021. These units contained an explanation of the discus throw and the presentation of an ideal 'live' model to demonstrate the correct technical performance of the activity. While completing the two educational units the students learned the required skills so they were familiar with the technical aspects of performance. The pre-tests to assess some physical abilities and technical performance associated with the athletic event took place at the end of the second educational unit.

#### Educational Curriculum

A series of ten and two introductory units was provided as the educational curriculum. There were two units of instruction delivered each week and each unit lasted 90 minutes. Each instructional unit had a 20 minute preparatory period which was broken into three parts. The first

part was a two-minute presentation, followed by an eight-minute general warm-up that was geared toward preparing the body for exercise. The third part was a separate 10 minute specific warm up involving a range of exercises relevant to the needs of the main part of the unit. The main section was 60 minutes and was the most critical part of each teaching unit. It was divided into two main components. This was the teaching part, and this took about 20 minutes and the technical aspects of the skill was explained. For the practical part the activity was on the performance of the discus throw and the salient technical movements of each discus throw which include the ready stance and forward swing, the rotation phase, the throwing position, the throwing stage, the switching stage and the balance stage.

The correct throwing position was given special consideration as it is critical for the accuracy and efficiency of the throw. The technical stages were presented in isolation for teaching purposes, but were consistently regarded as parts of a whole motor performance.

The sample group was also given the different stages of the activity on their own device so that the students could watch the technical progression of the skill and perform the practical stages of the skill. The practical section was 40 minutes long.

The last 10 minutes of this teaching unit were spent in recreational activities and exercises for the purpose of gradually calming the body and bringing it back to its normal state, and then the closing and departure formal speech.

#### Post-Tests

The post-tests were given to the research sample following completion of the 10 educational units on 23/03/2021 at 9:00 a.m. In order to keep the procedures consistent the researcher took care to keep every time, place, tool, device and work team assisting the student the same for the post-test.

Three times were allowed for each thrower in the discus throw and the highest valid throw was tallied. Once the experiment was completed, the information about the research variables was collected, tabulated and compiled for subsequent comparison between the pre-test and the post-test data.

## RESEARCH RESULTS

The pre and post test scores for both groups were presented, analyzed and discussed for the performance variable.

The pre and post results of the control group and experimental group were presented, analyzed and then discussed to determine the difference in performance variable. These results were compared to identify the amount of improvement each group made and to assess the effectiveness of the different pedagogy used during the experimental period.

**Table 1. Shows results of pre- and post-tests for both groups and performance variable**

| Pre-test |       | Post-test |      | Calculated (t) value | Measurement unit | Sig. |
|----------|-------|-----------|------|----------------------|------------------|------|
| Mean     | St.d  | Mean      | St.d |                      |                  |      |
| 2.4      | 1.639 | 7.46      | 0.85 | 2.111                | Degree           | Sig. |

Tabular (t) value is (1.711) at a degree of freedom of (24) and under a significance level of (0.05).

Based on Table 1, there was a change in the results of the performance variable between the pre-test and post-test results. The average value in the pre-test was 2.4 with a standard deviation of 1.639, while in the post-test it increased to 7.46 with a standard deviation of 0.85. The calculation results showed a calculated t-value of 2.111, higher than the table t-value of 1.711 at the degree of freedom of 24 and the significance level of 0.05. The difference in the average value showed an increase in performance results after the implementation of the treatment.

**Table 2. Results of Pre-test and Post-test for Both Groups and Achievement Variable**

| Pre-test |      | Post-test |      | Calculated (t) Value | Measurement Unit | Sig. |
|----------|------|-----------|------|----------------------|------------------|------|
| Mean     | Std. | Mean      | Std. |                      |                  |      |

|       |       |        |       |       |       |      |
|-------|-------|--------|-------|-------|-------|------|
| 11.02 | 3.167 | 15.952 | 4.384 | 4.559 | Meter | Sig. |
|-------|-------|--------|-------|-------|-------|------|

Tabular (t) value is 1.711 at a degree of freedom (df) of 24 and at a significance level of 0.05.

Based on Table 2, the results of the achievement variable measurement showed an increase in the value from pre-test to post-test. The average pre-test score was 11.02 with a standard deviation of 3.167, then increased in the post-test to 15.952 with a standard deviation of 4.384. The calculated t-value was 4.559 with a meter measurement unit, while the table t-value was 1.711 at a degree of freedom (df) of 24 and a significance level of 0.05.

## DISCUSSION

In the pre-test, the mean score of research sample was 2.4 with a standard deviation of 1.639, whereas in the post-test the mean score went up to 7.46 with a standard deviation of 0.85 (as shown in Table 1). The calculated t-value for finding the difference between pre-test and post-test was 2.111 while the tabulated t-value at 24 degrees of freedom with 0.05 of significance level was 1.711. The result of this shows that the skill performance of the research sample has statistically significantly changed from pre test to post test in favoring the post test.

These results show that the pre test and post test measurements were statistically different with the post test being the higher measurement. The researcher believes that improvement resulted from use of special educational tools based on modern technology in educating discus-throw performance as part of the educational curriculum and the appropriateness of these tools with the level and capabilities of the research samples.

The use of these modern teaching aids gave the learners better chances to understand and practise technical skills of throwing at the discus jumping. Furthermore, repeated practice that was implemented by the sample during the educational period supported the level of skill performance and resulted in an obvious difference between pre and post test results. The comparison of pre and post tests to examine improvement of both groups in the Achievement Variable. The comparison of the pre and post tests to determine if there was improvement in the Achievement Variable for both groups.

The results of this study can be seen in Table 2 that the mean score of the research sample at pre-test was 11.02 with standard deviation 3.167 and mean score of the research sample at post-test was 15.952 with standard deviation 0.85. The calculated t value (4.559) was higher than the tabulated value of t (1.711) at 24 degrees of freedom and 0.05 significance level, so the differences between the pre and post tests were determined to be significant. This means that in terms of achievement level of the research sample, pre test and post test results were statistically significant with the post test being the superior.

The following results above show that there were significant differences between the pre-test and the post-test with the post-test being superior. The researcher concludes that use of Specialized Education Tools (SETs) in discus throwing instruction with the aid of modern technology in the educational curriculum and the appropriateness of the tools to the research sample is responsible for this improvement. The sample, also, got repeated practice during the teaching period which helped to increase the level of achievement and yield more remarkable differences as observed between the pre test and post test results.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

The use of blended learning with modern technologies in discus throwing had a more positive impact than the traditional teaching methods employed with the research sample. The techniques that are integrated into the educational curriculum of the students significantly influenced the students' achievements in the field of learning in the College of Physical Education and Sports Sciences. Modern technology also helped enhance the physical skills, in particular neuromuscular coordination among the students. This was reflected in the higher achievement and higher level of skill performance of the research sample at the end of the educational program.

## Recommendations

In the light of the above, the researcher suggests the application of modern technologies in discus throwing teaching due to their beneficial role in the teaching of discus throwing class and students' performance development.

There is also a recommendation to provide diversity of learning and teaching approaches and to fragment complex sporting activities and skills into more manageable parts, accessible to the student.

Educational authorities need to pay more attention to the provision of the appropriate educational facilities, technological aids and learning resources that can assist in enhancing the educational process in more stages and age groups.

Further studies focused on other sports and movement skills are required as well as efforts to analyse the impact of the new teaching techniques in different settings including different educational and performance levels of the samples.

Finally, it is better to have highly-trained and skilled teachers teaching the early stages of sports education to ensure that learning difficulties might be overcome and gaps that may exist in various teaching contexts should be minimised.

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