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The effectiveness of using educational video purification in learning the technical performance of the discus throw event

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Abstract
The purpose of this paper is to investigate the effectiveness of educational video filtration in teaching the technical performance of the discus throw to first-year intermediate students at Baghdad College High School for Boys. A two-group experimental approach was used, with the research sample consisting of (38) randomly selected students. The researcher relied on educational video filtration as a supportive educational tool. Educational and analytical video clips were shown, illustrating the stages of correct technical performance of the discus throw, with a focus on common errors and how to correct them. The experiment lasted for eight weeks, with two educational units per week. The results of the pre- and post-tests showed statistically significant differences in favor of the post-test, indicating the effectiveness of using educational video in improving students' technical performance. This improvement is attributed to the role of video in enhancing visual understanding, consolidating motor information, and providing immediate feedback, which helped students grasp the subtleties of performance and avoid errors. The researcher recommends the use of modern educational media, particularly educational video filtration, in physical education lessons, given its positive impact on accelerating the learning process and improving students' motor performance.

Keywords: Educational video, technical performance, discus throw

Introduction
The field of motor learning is one of the most advanced fields in the modern era, witnessing an increasing use of modern technologies aimed at improving athletic and educational performance and developing the technical and physical skills of players and learners. The use of modern technologies has an impact on the learning of motor skills by learners (Fayed, Hawish, and Hamlawi, 2021) [11]. Among these technologies, educational video technology occupies a prominent position as an effective educational tool that contributes to improving performance and consolidating skills, especially in sports that require precise technical movements and high motor coordination, such as track and field. These games consist of track and field races, running and walking races, and compound races, where victory depends on time and distance (Abu Al-Jamous, Ali Hassan, 2012) [3].

The discus throw is one of the precise technical events in track and field competitions, requiring high neuromuscular coordination, sound motor awareness, and regular training in the correct motor pattern to achieve the maximum possible distance when throwing. Therefore, when teaching the discus throw, illustrative tools are required to help achieve a high level of mechanics, given its complex technical stages (Fathallah Muhammad Al-Alam, Saad 2021) [10]. Technical and cognitive performance. Trainers and teachers face challenges in teaching this activity, especially to beginners, due to the multiple stages of technical performance, including the preliminary, rotational, and final stages. This requires the use of effective educational methods that support the learning process and contribute to the formation of a clear mental image of correct motor performance (Abdul Hamid, 2016) [1].

Recent studies have demonstrated the importance of using video as a teaching aid. Instructional video provides learners with the ability to view a typical technical performance multiple times, from multiple camera angles. This enhances opportunities for visual and sensory perception of the movement and contributes to consolidating the correct motor pattern

in long-term motor memory (Williams & Hodges, 2005) [24]. Video technology also allows learners to compare their performance with the typical performance, which enhances self-awareness of execution errors and accelerates the correction and learning process (Rizzolatti & Craighero, 2004) [21]. This view is consistent with the theory of observational learning, which emphasizes that observing correct motor models helps learners form accurate mental representations of the movement, facilitating the learning process and accelerating its development, especially when viewing is coupled with immediate feedback (Magill & Anderson, 2017) [18]. Furthermore, video provides an interactive learning environment in which replay, commentary, and analysis are possible, making the educational process more effective compared to traditional methods that rely solely on verbal explanation. Numerous studies have examined the effectiveness of using video in learning sports skills. These include (Zetou *et al*., 2002) [25], which indicated that the use of video led to a significant improvement in the skill performance of volleyball players. (Muhammad, Ahmed, 2020) [19] Study also demonstrated that the use of video in long jump training contributed to the development of students' technical performance. (Al-Hanawi, Mahmoud, 2018) [4] Also noted that educational video is an integrated educational tool that combines sound, image, and movement, helping to develop motor awareness and deepen understanding.

Based on this, the importance of this study lies in highlighting the effectiveness of using educational video technology in learning the technical performance of the discus throw. This study seeks to provide a scientific framework that contributes to the development of learning methods and approaches in the field of school sports for physical education lessons. It also aims to present results that may open new horizons for the use of modern technology to improve the efficiency of training and education, particularly in complex technical events such as the discus throw.

Research problem

The discus throw is an event that requires a high level of precision in motor performance and integration of mechanical and technical elements, given its multiple stages, such as stance, rotation, weight transfer, and balance. These stages must be executed smoothly and harmoniously to achieve the maximum possible distance. However, field experience in Iraqi schools indicates a clear weakness among middle school students in mastering this activity. This is largely due to reliance on traditional teaching methods, which often focus on verbal explanation and an incomplete live model, without providing accurate visual feedback to help students recognize and correct errors.

Current technological developments have provided new, more effective educational possibilities, most notably analytical educational video, which enables students to view their own performance and analyze it in comparison to an ideal model. This enhances visual-motor perception and accelerates the learning process. Numerous studies have confirmed that the use of video visual feedback contributes to improving learners' technical performance, particularly in complex and mechanical skills such as throwing and hurling.

Although there are studies that have addressed the use of video to develop athletic performance in general, there are few studies that have specifically addressed the effectiveness of this method in teaching the discus throw to secondary school students in the Iraqi context. This raises questions about the effectiveness of this method in improving technical performance in this activity compared to traditional methods. Hence, the research problem is defined by the following question:

How effective is the use of educational video editing in teaching the technical performance of the discus throw to middle school students at Baghdad College High School?

Research objective

- To identify the effect of using an educational video on learning the technical performance of the discus throw.
- To identify the effect of using an educational video on the distance covered in the discus throw.
- To determine the extent to which the educational video accelerates the technical learning process.

Research hypotheses

- There are statistically significant differences between the pre- and post-tests of the sample on the research variables.

Research fields

- Human field: First-year students at Baghdad College Secondary School for Boys
- Time field: (22/10/2023) to (19/12/2023)
- Spatial field: Outdoor playground at Baghdad College Secondary School for Boys

Research methodology and field procedures

Research Methodology

The research community was deliberately selected from the first intermediate students at Baghdad College High School for Boys for the academic year (2023-2024), numbering (88) students distributed among four sections who practice physical education lessons and whose curriculum includes the discus throwing activity within the athletics lessons.

Community and sample research

The research sample was randomly selected from the research community. Two classes were chosen by lottery. Class (A), consisting of (22) students, represented the experimental group for the research sample, and Class (C), consisting of (22) students, represented the control group for the research sample. After excluding irregular and absent students, sick students, and students in the pilot study, the research sample consisted of (19) students per class. To ensure sample homogeneity, the researcher extracted the arithmetic mean, median, standard deviation, and skewness coefficient for the research sample for age, height, and weight. The results demonstrated the homogeneity of the sample, as it was limited to (± 3), as shown in Table (1).

Table 1: shows the homogeneity of the research sample members.

No.	Variables	Mean	Median	Std. Deviations	Skewness
1	Age	16.016	16.000	0.688	0.149
2	Height	166.41	166.00	1.211	0.427
3	Mass	59.250	59.250	0.762	0.562

To verify sample equivalence across research variables, an independent samples t-test was used. The results showed that the differences between them were insignificant below the significance level of (0.025) and with a degree of freedom of (36), indicating the equivalence of the two groups in the pre-test, as shown in Table (2).

Table (2) shows sample equivalence between the two groups for research variables.

Stages	Experimental group		Control group		T value calculated	Level Sig	Degree of freedom	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation				
Stance	0.792	0.021	0.782	0.016	1.543	0.422	36	Non sig
Rotation	0.680	0.023	0.700	0.022	2.593	0.329	36	Non sig
Transfer	0.686	0.015	0.694	0.019	1.451	0.411	36	Non sig
Throwing	0.737	0.018	0.718	0.025	2.572	0.118	36	Non sig
Balance	0.771	0.021	0.783	0.033	1.391	0.184	36	Non sig
Distance	3.792	0.046	3.806	0.038	1.028	0.311	36	Non sig

Devices and Tools Used in the Research:
To achieve the research objectives and implement its fieldwork, a set of devices and tools were used to assist in conducting the tests and collecting data and analyzing performance. These devices are as follows:

- **(6) Multi-weight throwing discs:** for use in practical applications and skill tests.
- **High-resolution digital video camera:** for recording students' technical performance during the discus throw.
- **Laptop equipped with motion video analysis software (Dartfish) (Kinovea):** For use in learning technical performance and providing feedback to students using educational video editing.
- **Data Show and Display Screen:** for displaying video footage and reviewing technical performance in front of students collectively.
- **Tape Measure (50 meters):** for measuring the distance achieved by the student in throwing the discus during the test.
- **Technical Performance Evaluation Form:** prepared by the researcher and including specific elements to evaluate technical performance according to the specific test and approved motor standards.
- **Timing Whistle:** for organizing Student performance during tests and exercises.
- **Stationery (notebooks, pens, scorecards, score sheet):** To record performance results, distance, and notes during the experiment.
- **Scale:** To measure students' weight.
- **Stadiometer:** To measure students' height.

First: Kinovea
Kinovea is a free, open-source program designed for analyzing sports movement. It segments various videos that help learn motor skills. It features an easy-to-use interface and is widely used in educational and training institutions.
Its most prominent functions:

- Capture motor performance and determine precise movement frames.
- Used in motor learning.
- Measure angles, distances, and time-speed.
- Compare the student's performance against the technical model.
- Add comments and notes directly to the video.
- Save the performance for later analysis or presentation to the student during the lesson.

Kinovea program features

- Control video speed.
- Convert the video to 3D.
- Pause and play the clip.
- Return to the previous file.
- Make the program take full screen.
- Control the volume.
- Identify the body units involved in completing the motor skill.
- Advance and rewind the video in 0.01 seconds.
- Segment motor skills into multiple segments per second (Kinogrammes) (Jalali, Rania, Judy Yamouna, 2022) [15].

Its role in the research:
In this research, the Kinovea program was used as an educational video and utilized to study and process students' performance in the discus throw. This was achieved by dividing the throw into phases (stance, rotation, transfer, throw, and balance), observing and documenting recurring errors to provide direct feedback to the student, contributing to the learning process. This was achieved by repeatedly viewing the video in slow motion.

Second: Dartfish Program
Dartfish is an advanced professional program used by coaches and academics to accurately analyze the motor performance of athletes and learners. It is also used in scientific research.
Its most prominent functions:

- Record motor performance at high frame rates.
- Analyze performance using graphs and three-dimensional angles.
- Simultaneous comparison of multiple videos.
- Track the movement of body parts and provide motion analysis graphics.
- Share notes with the student visa interactive interfaces.

Its role in the research: Dartfish enables researchers to prepare an accurate scientific assessment of technical performance by recording and saving learners' performances, tracking their technical development in educational units, and identifying individual differences in the technical phases of the discus throw (stance, rotation, transfer, throw, balance) during the throw. It helps provide a visual explanation of errors that were not apparent in traditional assessments, as well as improving sensorimotor perception. The use of motion video analysis software such as Kinovea and Dartfish is considered an advanced educational step in motor learning that helps transition from traditional teaching to active, interactive learning, where the student becomes involved in understanding and correcting his movement, which leads to a significant improvement in technical performance. Therefore, the role of the two software in this research was an advanced educational tool using educational video to provide feedback to learners.

Tests
First Test: Technical Performance Test (Constructive Analytical) Al-Morsi, Hamed Mahmoud (2000)

- **Test Name:** Technical Performance Test for Discus Throwing According to Technical Phase Analysis
- **Objective:** To evaluate the quality of technical performance by analyzing the basic phases of discus throwing.

Equipment
- Legal Discus
- Throwing Circle
- Video Camera
- Technical Performance Evaluation Form
- Measuring Tape

- **Test Description:** The student is asked to perform three attempts to throw the discus from within the circle. Each attempt is videotaped and analyzed according to 5 or 6 movement phases (stance, rotation, transfer, propulsion (rotation), balance, and exit). A score is awarded for each phase as shown in the evaluation form.

Measurement Method
- Total Score: 10 points
- Evaluation Elements and degree Distribution:

No.	Technical Stage	Maximum degree
1	Initial stance, body position, and discus	2
2	Rotation and balance during the performance	2
3	Weight transfer and motor timing	2
4	Arm movement and final discus throw	2
5	Balance and fluidity after the throw	2
Total		10 degrees

A score of 0 to 2 is awarded for each element based on the quality of execution.

Second test: Distance Test (Digital) (Abdul Majeed, Ahmed Nasr El-Din 2006) [2]
- **Test Name:** Discus Throw Distance Test.
- **Objective:** To determine the level of technical strength and practical application of performance through the distance traveled by the discus.

Equipment
- Legal Discus
- Throwing Circle
- 50-meter Measuring Tape
- Floor Markers (for visual fixation)
- Whistle or Timer

- **Test Description: The** student stands inside the throwing circle and performs three attempts to throw the discus with the maximum possible performance while adhering to the technical model.
- **Measurement Method:** Total Score: 10 degree, Distribution of Points According to Distance achieved.

Degree	Distance (meters)
10	More than 25 m
8-9	21 - 25 m
6-7	16 - 20 m
4-5	11 - 15 m
2-3	6 - 10 m
1	Less than 6 m

Discus Throw Technical Performance Evaluation Form
The researcher prepared a form based on the technical performance test above to evaluate the learners' performance level in the discus throw event. This form included the full motor sequence after consulting with athletics specialists, as shown in Appendix (1).

Exploratory Experiment
The exploratory experiment is an essential and important step in preparing scientific research. It aims to verify the accuracy of the approved tests and uncover any potential errors or obstacles that the researcher may encounter during the implementation of the main experiment (Al-Shanawi, Abdel Hamid, 2015) [6]
The researcher conducted this experiment on Sunday, October 22, 2023, on a sample of (6) students from Baghdad College High School for Boys. The goal was to train the support team to properly implement field procedures, determine the time required to conduct the approved tests in the research, and overcome potential field difficulties during actual implementation.

Main Experiment
The main experiment was conducted from Tuesday (October 24, 2023) to Sunday (December 17, 2023). The researcher prepared an educational curriculum for the experimental group for the discus throw activity for an eight-week period, consisting of 16 educational units, each lasting (45) minutes. They used the Kinovea program as an educational video, which they used to study and process students' performance in the discus throw activity. They also used the Dartfish program, which accurately scientifically evaluates learners' technical performance by recording and saving their performance, and tracking the development of their technical performance in the educational units throughout the experiment period. The control group used the traditional method, which relies solely on the teacher.

Pre-tests
The researcher conducted the pre-tests in the outdoor yard of Baghdad College High School for Boys at 10:00 AM on Monday, October 23, 2023. He adhered to the same conditions and procedures that would be used later for the post-tests, ensuring the consistency and reliability of the results.

Post-test
The researcher conducted the post-tests in the outdoor yard of Baghdad College High School for Boys at 10:00 AM on Tuesday, December 19, 2023. He followed the same procedures used for the pre-tests to ensure accurate comparisons and achieve reliability.

Statistical Methods
The researcher relied on the Statistical Package for the Social Sciences (SPSS) program to process the research data. It was used to extract arithmetic means and standard deviations, in addition to a t-test for correlated samples, to determine the significance of differences between the results of the pre- and post-tests.

Results and Discussion
Presentation, analysis, and discussion of the arithmetic means, their standard deviations, the difference between them, the calculated t-value, and the significance of the differences between the tests on the research variables

Table 3: Shows the arithmetic means, their standard deviations, the difference between them, the calculated t-value, and the significance of the differences between the two tests: pre- and post-tests, for the experimental group on the research variables:

Stages	Pre-test		Post-test		Arithmetic mean of difference	Standard deviation of differences	T value calculated	Level Sig	degree of freedom	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation						
Stance	0.792	0.021	1.247	0.171	0.455	0.165	11.963	0.000	18	Sig
Rotation	0.680	0.234	1.031	0.074	0.351	0.801	19.096	0.000	18	Sig
Transfer	0.686	0.015	1.014	0.058	0.327	0.068	20.908	0.000	18	Sig
Throwing	0.737	0.018	1.126	0.114	0.338	0.113	14.928	0.000	18	Sig
Balance	0.771	0.021	1.206	0.116	0.435	0.122	15.445	0.000	18	Sig
Distance	3.792	0.046	7.457	0.033	3.665	0.322	49.556	0.000	18	Sig

Table (3) shows that the arithmetic means between the results of the pre- and post-tests for the experimental group in the research variables (stance, rotation, transfer, throwing, balance) were (0.792), (0.680), (0.686), (0.737), (0.771), (3.792) for the pre-test, respectively, and (1.247), (1.031), (1.014), (1.126), (1.206), (7.457) for the post-test, respectively, with standard deviations of (0.021), (0.234), (0.015), (0.018), (0.021), (0.046) for the pre-test, respectively, and (0.171), (0.074), (0.058). (0.114), (0.116), (0.33) for the post-test respectively, while the difference in arithmetic means between the results of the two tests amounted to (0.455), (0.351), (0.327) (0.338), (0.435), (3.665) respectively, with standard deviations of the differences amounting to (0.165), (0.801), (0.068), (0.113), (0.122), (0.322) respectively, and the calculated (t) values amounted to (11.963), (19.069), (20.908), (14.928), (15.445), (49.556) respectively, while the error level was (0.000), respectively, which is less than the error rate (0.05), in front of the degree of freedom (18) This indicates significant differences between the pre- and post-tests, in favor of the post-test, in all research variables for the experimental group.

Table 4: Shows the arithmetic means, their standard deviations, and the difference between them, the calculated t-value, and the significance of the differences between the pre- and post-tests for the control group in the research variables.

Stages	Pre-test		Post-test		Arithmetic mean of difference	Standard deviation of differences	T value calculated	Level Sig	degree of freedom	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation						
Stance	0.782	0.016	1.078	0.108	0.296	0.104	12.308	0.000	18	Sig
Rotation	0.700	0.228	0.886	0.485	0.186	0.035	22.699	0.000	18	Sig
Transfer	0.694	0.019	0.887	0.018	0.193	0.015	53.787	0.000	18	Sig
Throwing	0.718	0.025	0.930	0.029	0.211	0.031	28.790	0.000	18	Sig
Balance	0.783	0.033	1.054	0.118	0.270	0.126	9.308	0.000	18	Sig
Distance	3.806	0.038	6.026	0.424	2.219	0.404	23.896	0.000	18	Sig

Table (4) shows that the arithmetic means between the results of the pre- and post-tests for the control group in the research variables (stance, rotation, transfer, throwing, balance) were (0.782), (0.700), (0.694), (0.718), (0.783), (3.806) for the pre-test, respectively, and were (1.078), (0.886), (0.887), (0.930), (1.054), (6.026) for the post-test, respectively, with standard deviations of (0.016), (0.228), (0.019), (0.025), (0.033), (0.038) for the pre-test, respectively, and were (0.108), (0.485), (0.018), (0.029), (0.118), (0.424) for the post-test respectively, while the difference in arithmetic means between the results of the two tests amounted to (0.186), (0.296), (0.193) (0.211), (0.270), (2.219) respectively, with standard deviations of the differences amounting to (0.104), (0.035), (0.015), (0.031), (0.126), (0.424) respectively, and the calculated (t) values amounted to (12.308), (22699), (53.787), (28.790), (9.308), (23.896) respectively, while the error level was (0.000), respectively, which is less than the error rate (0.05), in front of the degree of freedom (18) This indicates significant differences between the pre- and post-tests, in favor of the post-test, in all research variables for the control group.

Table 5: Shows the arithmetic means, standard deviations, and calculated t-value for the two groups (control and experimental) in the research variables for the post-test:

Stages	Experimental group		Control group		T value calculated	Level Sig	degree of freedom	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation				
Stance	1.247	0.171	1.078	0.108	3.623	0.001	36	Sig
Rotation	1.031	0.074	0.886	0.485	7.092	0.000	36	Sig
Transfer	1.014	0.058	0.887	0.018	8.986	0.000	36	Sig
Throwing	1.126	0.114	0.930	0.029	7.226	0.000	36	Sig
Balance	1.206	0.116	1.054	0.118	4.008	0.000	36	Sig
Distance	7.457	0.338	6.026	0.424	11.496	0.000	36	Sig

Table (5) shows that the arithmetic means in the post-test for the experimental group in the variables under study (stance, rotation, transfer, throwing, balance) reached (1.247), (1.031), (1.014), (1.126), (1.206), (7.457) respectively, with standard deviations of (0.171), (0.074), (0.058), (0.114), (0.116), (0.338) for the post-test respectively, while the arithmetic means in the post-test for the control group in the variables under study (take your place, prepare, throwing, speed increase) reached (0.108), (0.485), (0.018), (0.029), (0.118), (6.026), with standard deviations of (0.171), (0.074), (0.058), (0.114), (0.116), (0.338) for the post-test respectively. Standard values of (0.104), (0.035), (0.015), (0.031), (0.126),

(0.424) respectively, and the calculated (t) values were (3.623), (7.092), (8.986), (7.226), (4.008), (11.496), while the error level was (0.000), respectively, is less than the error rate (0.05), in front of the degree of freedom (36), and this indicates significant differences in the post-test for the experimental group.

Discussion of the Results

The statistical results of the pre- and post-tests for the two groups indicate a noticeable and statistically significant improvement in both technical performance and distance achieved in the discus throw, in favor of the experimental group, after implementing the educational program based on the educational video purification.

The analysis of the results reveals that the use of educational video technology had a clear and effective impact on improving both technical performance and quantitative achievement (distance) among the sample members. This indicates that an educational environment supported by visual stimuli and immediate feedback is ideal for teaching throwing activities, especially given the difficulties in perceiving movements through verbal guidance alone.

Integrating modern technology into school learning and teaching in physical education is no longer an option, but rather a necessity. This study demonstrated that educational video is an effective means of developing both skill and achievement. This supports modern trends in motor learning and physical education, which call for the use of technological means in various educational situations.

First: In the technical performance test

The experimental group's arithmetic mean increased more than the control group's in the technical performance post-test. This reflects that the use of educational video helped students improve their technical skills by rewatching their performances and visually analyzing errors. This is supported by (Ali, Fouad Abdel Salam, 2012) [5] statement that multimedia is an effective educational tool for learning complex motor skills.

It is worth noting that this improvement is due to the nature of educational video as an audio-visual medium that combines repeated viewing, visual motor analysis, and linking movements to real-time. This enhances learners' motor perception and contributes to building an accurate mental image of the movement. According to (Magill & Anderson, 2017) [18], presenting the motor model via video helps the learner visualize the movement and store it in long-term motor memory, leading to a gradual and systematic improvement in technical performance. The researcher agrees with (Hisham, Al-Sayeh Lambarak, 2020) [13] that modern technology has a clear impact on the effective implementation of the educational program through the positive use of the Kinovea program in motor learning. In addition to the use of Dartfish, which contributed to learners' engagement in learning, this study aligns with (Fathallah Elalem, S., 2016) [9] study regarding performance assessment and the use of instructional video. The study found that the educational program relied on performance assessment using Dartfish to learn the hammer throw.

(Attia, Muhammad Abdel Aziz, 2016) [7] Also noted that visual feedback enables students to perceive details of their movements that are difficult to observe in live performances and helps them self-correct, enhancing technical performance.

In the same context, (Magill, 2011) [17] explained that motor learning improves when exercise is coupled with visual feedback via video. This helps the learner build an accurate mental image of the movement, which is essential for skills that require precise technical sequences, such as the discus throw. This result is consistent with what (Ali, Fouad Abdel Salam, 2012) [5] indicated in their study on "The Effectiveness of Multimedia in Improving Motor Skills," where they confirmed that presenting performances in an educational video provides the learner with an accurate visual representation of the correct movement and promotes mental repetition and self-correction. It also agrees with the findings of (Razon *et al*., 2010) [20], who concluded that visual feedback through performance recording is a crucial factor in learning complex sports skills, especially those with fine motor components, such as the discus throw. Therefore, the researcher emphasizes that one of the most important ways to improve the technical performance of a skill or its effectiveness is to replay the video to recapitulate information and correct errors through the use of feedback. This is in line with (Barakati, Nasr Al-Din, 2018), who stated that the use of visual feedback is one of the most important methods that can be implemented by playing the video more than once.

Second: In the distance test

The experimental group's mean increased more than the control group's in the post-test. This indicates a tangible improvement in physical performance outcomes, not just technical ones. This improvement is due to the fact that the use of the educational video not only helped students improve their technical movements but also enhanced their accuracy, resulting in longer and more effective throws.

This noticeable improvement indicates a qualitative shift in motor performance efficiency and a real transition from learning to performance. This improvement in distance is attributed to the improvement in technical aspects enhanced with the video. The learners' interaction with the video motivates them to continue and adhere to the components of the educational units, such as repetition in performance, i.e., improved motor coordination (neuromuscular), and enhanced visual-motor understanding, i.e., correcting errors through correcting the exercise, proper timing, and the coordination of the fluid movements necessary to execute the throw with the highest efficiency. This conclusion supports the findings of (Schmidt & Wrisberg, 2008), who argued that precise technical performance inherently leads to better quantitative results, especially in events measured by distance or time, such as the discus throw.

(Razon *et al*., 2010) [20] Confirmed that visual feedback through video significantly improved players' physical performance, particularly in games that involve throwing and hurling.

This is consistent with the findings of (Magill, 2011) [17] in his book "Motor Learning and Control," where he indicated that combining instructional video with motor repetition improved both quantitative and technical performance, as it facilitates the learner's ability to link muscular effort to motor output. In addition, (Attia, Muhammad Abdel Aziz, 2016) [7] indicated that self-review via video contributes to the development of throwing and hurling skills in particular, as they require precision, timing, and coordination between body parts.

Third: Interpretation of Differences

The results of all the tables show that the large differences between the averages are in favor of the experimental group. Studies have confirmed that the use of advanced technology software helps and contributes to students' effective and significant learning and acquisition of motor skills, with high

efficiency in their technical performance (Hung, *et al*. 2018, Taheri-Torbati and Sotoodeh 2019) [14, 23]. This indicates a strong impact of the video-based educational program. These results are consistent with the study (Zetou *et al*., 2002) [25], which confirmed that the use of educational videos contributes to improving learners' skill and motor performance through re-watching, analysis, and immediate feedback. (Abdel Hamid, Ibrahim, 2016) [1] Also indicated that visual presentation tools such as video are among the most effective methods for teaching complex motor skills that require high awareness and constant repetition. (Hanous Imad, Alaoui Abdelhafidh, 2021) [12] Mention that the Kinovea program is a slow-motion video player, which provides motor skill assessment, recording, and writing notes on the technical performance of the activity to be learned. This helped the experimental group excel in all research variables due to the frequent re-evaluation and continuous performance assessment with educational video.

Conclusions and Recommendations

Conclusions

According to the statistical results obtained after implementing the educational program based on video filtration, the following conclusions can be drawn:

- The experimental group demonstrated significant improvement in technical performance in the discus throw after applying video filtration, compared to the control group.
- The educational video contributed to increasing students' awareness of motor errors, enabling them to correct them more effectively than traditional methods.
- The technical improvement was positively reflected in the quantitative performance outcomes, as the distance achieved by the students in the discus throw improved significantly.
- Video filtration is an effective technological method that combines observation, feedback, and self-correction.
- The educational program based on visual analysis proved effective in developing all technical stages of the discus throw.
- The educational video is a new method that had not been used before, which stimulated students' thinking, increased their interest, and prevented them from feeling bored while learning.

Recommendations

Based on the findings and conclusions reached, the researcher recommends the following:

- Adopt educational video editing as an essential component of physical education lessons, especially for complex technical skills.
- Develop video-based educational training programs for athletics events, providing exemplary models of student motor performance.
- Train physical education teachers on how to use video assessment tools and movement analysis programs such as Kinovea and Dartfish.
- Encourage schools to provide technological infrastructure (cameras, computers, and screens) to support modern motor education.
- Conduct further field studies examining the impact of educational video on other sports events such as javelin throw, shot put, and high jump.
- Include video feedback in final assessment tests for practical skills.

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Appendix 1: Show the model of Educational Unit - Discus Throw Activity

Class	First Intermediate
Number of Students	19 students
Location	School yard - Baghdad College High School
Duration	45 minutes
Unit Objectives	1 .Timing your steps during the throwing motion 2 .Improving balance and coordination 3 .Training the complete performance without equipment
Educational Resources	Display screen - Slow motion educational videos - Whistle - Floor markings
Preparation (5) minutes	-Classroom organization -General warm-up exercises -Quick explanation of the previous lesson's content
Presentation (25 minutes)	-Watch an instructional video of a player performing a discus throw without a tool. -Explain the stages of the movement (preparation, transition, and throw). -Practice: Perform the movement without a disc in parts and then as a whole, with the teacher monitoring and correcting the performance.
Practical exercises	-Arm movement exercise in the throwing path -Balance exercise during rotation -Full performance simulation without equipment
Immediate video analysis	Record quick clips of students' performances using a phone or simple camera, and watch them live with corrective comments.
Conclusion (10 minutes)	-Final group performance without an instrument -Discussion of common mistakes -Individual feedback + homework (watch a specific video to learn later)
Notes	-Consider individual differences in balance -Focus on accuracy, not speed -Take notes to evaluate performance

Discus Throw Curriculum - 8 Weeks
Week 1: Preparation and Conceptual Understanding

Unit 1: Introduction and Definition of Discus Throw
Objectives
- Introduce students to the discus throw (rules, distance, weight).
- Explain the basic stages of the technique.

Exercises
- Watch a general instructional video on discus throwing.
- Practice arm movement without a prop.
- Practice balance in the ready position.

Unit 2: Initial Position and Readiness
Objectives
- Teach the correct ready position.
- Practice standing inside the circle.

Exercises
- Correct standing inside an imaginary circle.
- Arm movement without a disc.
- Slow-motion video to learn and analyze the starting position.

Week 2: Balance and Movement in the Circle

Unit 3: Circular Movement Steps
Objectives
- Learn transition steps.
- Improve balance while rotating.

Exercises
- Walk slowly inside the circle.
- Repeated transition drills.
- Slow-motion demonstration video.

Unit 4: Strengthening the Complete Rotation
Objectives
- Perform a complete rotation without a throw.
- Develop arm-to-torso coordination.

Exercises
- Balance exercise + a light-body rotation.
- Video to teach and preview the movement and correct student errors.

Week 3: Learning to perform without an apparatus

Unit 5: Movement without a Disc

Objectives
- Adjust step timing.
- Strengthen the core and arm muscles.

Exercises
- Drills without an apparatus.
- Simulate a throw using an imaginary disc.
- Instructional and analytical video of students performing the same exercises.

Unit 6: Motor Coordination
Objectives
- Combine balance, rotation, and arm rotation.
- Build integrated performance without a throw.

Exercises
- Mock full-performance drills.
- Instructional video to demonstrate and evaluate student errors.

Week 4: Beginning to Use the Disc

Unit 7: Grasping and Controlling the Disc
Objectives
- Learn the correct grip for the disc.
- Practice the initial movement with the disc.

Exercises
- Grip + Pass Exercise.
- Video demonstrating correct grip techniques.

Unit 8: Initial Throwing Experience
Objectives
- Perform the first partial throw.
- Improve balance with the disc.

Exercises
- Throw a disc from a stationary position.
- Review a video for each student and provide immediate correction.

Week 5: Developing Technical Performance
Unit 9: Throwing Phases: Start and Transition
Objectives
Improve the transition from the initial position to rotation.

Exercises
- Perform the throwing phases in a divided manner.
- Instructional video, slow-motion preview, and comparison with a global model.

Unit 10: Throwing Phases: Throw and Release
Objectives
- Perform the final portion of the throw.
- Improve the timing of the throw.

Exercises
- Discus push drills from a semicircle position.
- View a corrective video for each student. Student.

Week 6: Full Performance under Observation

Unit 11: Full Performance (First Attempt).
Objectives
Perform the full throw and observe the technique.

Exercises
- Perform a full throw.
- Record a video of the students and analyze it collectively.

Unit 12: Correcting Frequent Errors
Objectives
Identify and correct technical errors.

Exercises
- Targeted drills based on common errors.
- Re-execute the throw after correction.

Week 7: Skill Deepening and Performance Consolidation

Unit 13: Repetitive Performance
Objectives
Consolidate a comprehensive technical performance.

Exercises
- Perform the throw several times.
- Comparison video of previous and current performances.

Unit 14 Performance Consolidation under Pressure
Objectives
Train students to throw under competition-like conditions.

Exercises
- Group challenges.
- Internal judging and video technical evaluation.

Week 8: Final Assessment

Unit 15: Post-Test
Objectives
Evaluate the final technical performance after Training.
Exercises
Each student has to perform 3 attempts.
Record results and evaluate performance via video.

Unit 16 - Review and Feedback
Objectives
- Provide comprehensive feedback to each student.
- Compare pre- and post-test performance.

Exercises
- View student clips before and after.
- Discuss improvement and learn lessons.

Appendix 2: Shows the names of the evaluators for the discus throw performance.

Specialist Name	Academic Title	Specialization	Affiliations
Haider Faeq Al-Shamaa	Prof. Dr.	Athletics	College of Physical Education - University of Baghdad
Ahmed Mohammed Ismail	Prof. Dr.	Athletics	College of Physical Education - University of Baghdad
Haider Nawar Hussein	Assist. Prof. Dr.	Athletics	Ministry of Education