The impact of a proposed training program using the educational technological intermediary (video) on the learning of drible ability of ball and accuracy of basketball shooting among players under 15 years in basketball

Boudouani Abderrezak [1*], Rebouh Salah [2], Ouddak Mohamed[3]

[1] University Hassiba Benbouali Chlef (Algeria).

a.boudouani@univ-chlef.dz

2 University Ahmed Ben Yahia Al Wancharissi Tissemsilt.

saladin1610@hotmail.com

3 University Hassiba Benbouali Chlef (Algeria).

m.ouddak@univ-chlef.dz

Date of transmission: 18/09/ 2025, date of acceptance: 15/11/ 2025

****

Abstract:

The research aimed to study the impact of a proposed training program by using the technological educational support (video) to learn the skills of ball dribble and shoot among players in a category of less than 15 years in basketball. The researchers used the experimental program. The main results were as follows: The proposed video training program positively contributes to the learning ability of ball dribble and shoot to the basket among players under the age of 15 in basketball.

key words: Training Program; Technological Educational Support (video); the skills of ball dribble and shoot; a category Under 15; basketball.

* Boudouani Abderrezak

Introduction:

Basketball is considered one of the most prominent team sports, holding a distinguished position among both modern and traditional athletic disciplines. Unlike many other sports, basketball has gained immense popularity across nations and cultures worldwide. It is ranked as the second most widely practiced sport globally. This widespread acceptance is largely due to its alignment with advancements in modern technology and the incorporation of scientific principles to develop effective and innovative methods that suit various contexts of time and place. These efforts aim to achieve the highest forms of athletic excellence, enabling athletes to reach peak levels of performance and mastery across different stages of competition.

Experts in the field of basketball strive to attain this goal through scientifically structured training programs, which are designed to enhance the physical fitness, exertion capacity, adaptability, and overall development of players.

Modern sports training methods aim to elevate both physical and technical performance, ultimately leading to outstanding achievements across various sporting disciplines. Coaches aim to select the most appropriate and effective training methods, employing the latest tools suited to each specialized activity. Among these tools is the use of educational media, including video, which serves to directly influence and improve physical and technical performance. **(Mufti Ibrahim, 1997, p.66)**

Proper player preparation is essential, as it allows coaches to practically implement their theoretical knowledge. It also equips both coaches and players with real-life experience through direct interaction with the field, helping to translate competencies into performance skills. **(Al-Agha Ihsan & Abdel Moneim Abdullah, 1995, p.27)** In this regard, motor skills represent the foundational element of any sport—they are considered the core and essence of athletic performance. Mastery of a skill is only achieved by reaching the highest performance levels with the least physical effort and in the shortest possible time. **(Toubal et al., 2025).**

The physical performance of both junior and senior players evolves through different developmental pathways. Young athletes, in particular—who are undergoing noticeable physical growth and technical refinement—often experience rapid fluctuations in their performance. **(Slamani et al., 2025)** This highlights the need for long-term planning in training.

Basketball, like many other sports, has long been governed by scientific principles. Developed countries have invested considerable efforts in instilling the fundamentals of the sport in younger age groups. This is in line with Weineck’s

assertion that the ability to achieve victories and high-level results depends on reaching the highest possible levels of physical, technical, tactical, and psychological capabilities. Thus, training programs must be systematically and scientifically structured in accordance with the principles of modern sports training. **(Jürgen Weineck, 1983, p.309)**

Technological tools have had a significant impact on modernizing learning methods and styles, becoming a critical element in advancing the teaching and learning process. They have allowed coaches to adopt innovative approaches and diverse media, offering learners greater opportunities for self-directed learning. The use of multimedia educational tools—such as video—has become one of the most effective instructional methods. It enables players to visualize abstract concepts, enhances understanding, fulfills learners' needs, increases engagement, and reduces the time needed for explanation. **(Al-Qari, Samiha Abdullah Abbas, 2005, pp. 5–6)**

In light of our interest in this subject, we proposed a training program based on the use of video as an educational medium—one of the most modern tools for teaching basketball's fundamental skills. Our study focuses specifically on players under the age of 15, particularly those in early adolescence (aged 13–14), a stage marked by significant physical and physiological changes. **(Saadia Mohamed Ali Hader, 1980, p.25)**

Accordingly, the general research question posed is as follows:

Does the proposed training program using technological educational media (video) affect the learning of dribbling and shooting accuracy skills in basketball players under the age of 15?

Sub-questions:

- Does the proposed training program using technological educational media (video) affect the learning of the dribbling skill among under-15 basketball players?
- Does the proposed training program using technological educational media (video) affect the learning of shooting accuracy toward the basket among under-15 basketball players?

General Hypothesis:

The proposed training program using technological educational media (video) has an effect on the learning of dribbling and shooting accuracy skills toward the basket among under-15 basketball players.

Sub-hypotheses:

- The proposed training program using technological educational media (video) affects the learning of the dribbling skill among basketball players.
- The proposed training program using technological educational media (video) affects the learning of shooting accuracy toward the basket among under-15 basketball players.

1.1. Objectives of the Study:

- To determine the effect of using technological educational media (video) on the learning of the dribbling skill among basketball players.
- To determine the effect of using technological educational media (video) on the learning of shooting accuracy toward the basket among basketball players.

1.2. Definition of Concepts and Terms:

Training Program:
Defined as "one of the components of a plan, without which planning is incomplete. The program represents the implementation steps in the form of detailed activities that must be carried out to achieve the objective" **(Al-Bayk & Abbas Imad Al-Din, 2003, p.102).**
Operationally, the researchers define it as a structured plan consisting of a series of training units focused on exercises aimed at developing certain physical attributes and motor skills in basketball through the use of video.

Educational Media:
Defined as a sub-system of educational technology comprising materials, tools, and devices used by the teacher or learner—or both—within educational settings in an organized manner to facilitate teaching and learning. **(Zoghbi, Ahmed Mohamed, 1996, Issue 87)**
Operationally, the researchers define educational media as tools used to evaluate and monitor student-teacher activities during practical teaching sessions, such as video cameras, computers and their associated software, data projectors, and devices linking all these components.

2. Methodology and Tools

2.1. Research Methodology:

The experimental method was used due to its suitability for the nature of the study. This approach allows the researcher to deliberately and systematically manipulate a specific variable—referred to as the independent or experimental variable—to observe its effect on other dependent variables. This methodology enables the researcher to draw more accurate conclusions. **(Fatima Awad Saber & Mervat Ali Khafaga, 2002, p.57)**

Achieving the goals of experimental methodology requires:

- Identifying all the variables that may influence the phenomenon under investigation (independent variables).
- Repeating the experiment multiple times, both to vary the controlled variables and to verify the reliability of the results.

The types of experiments under the experimental method include laboratory experiments, field experiments, and simulated experiments.

Field experiments take place in the actual natural environment where the phenomenon occurs, making them more realistic than laboratory experiments. However, field settings make it more difficult to control all influencing variables. **(Sheikh Kamel Mohamed Owaidah, 1996, p.56)**

2.2. Population and Sample of the Study:

The population includes all elements and individuals related to the issue or phenomenon under investigation. **(Rabi Mustafa Olayan & Othman Mohamed Ghoneim, 2000, p.137)** The study population consisted of all under-15 basketball players (U15 category) from teams competing in the western Regional Division.

The sample, which represents a subset of the study population selected through a specific method for experimentation, included all U15 players of MCB (Mouloudia Chelifienne basketball player).
The sample was selected intentionally. Five players were excluded for the purpose of conducting pilot experiments. Thus, the final sample consisted of 14 players.

2.3. Homogeneity of the Research Sample:

According to Vandaleen **(1985, p.398),** researchers must ensure that groups are homogeneous—at least in terms of variables relevant to the research.

To ensure this, the researchers verified the homogeneity of the sample based on the following variables:

- Chronological age, measured in years
- Height, measured in centimeters
- Weight, measured in kilograms

To determine the statistical significance of differences in these variables, the homogeneity between sample members was assessed. The results are presented in **Table 01**:

Table 01: Sample Homogeneity in Variables of Age, Height, and Weight

Variables	Unit of Measurement	Experimental Group		Control Group		Calculated T-value	Degrees of Freedom (df)	Tabulated T-value	Statistical Significance
		M	SD	M	SD				
Age	Years	13.92	1.02	14.00	1.17	1.40	12	2.17	Not statistically significant
Height	Meters	1.57	0.15	1.60	0.11	0.88			
Weight	Kilograms	52.01	2.11	51.25	2.25	1.92			

Significance level (α) = 0.05

From Table 01, it is evident that there are no statistically significant differences between the research groups in the study variables, as the calculated T-value was smaller than the tabulated T-value at a significance level of 0.05 and with 12 degrees of freedom, indicating the homogeneity of the sample groups in the variables of age, height, and weight.

2.4. Sample Equivalence:

Equivalence between the four groups was established using the Student's t-test on the pretest skill measurements. The purpose of this equivalence is to ensure that there are no differences between the research groups in these tests, thereby establishing a starting point for the study. The results are as follows:

Table 02 shows the extent of equivalence between the two research sample groups in the pretests.

Skills	Experimental Group		Control Group		Calculated T-value	Degrees of Freedom (df)	Significance Level	Tabulated T-value	Statistical Significance
	M	SD	M	SD					
Dribbling	33.35	1.87	33.30	1.453	0.85	12	0.05	2.17	Not statistically significant
Shooting	3.92	2.05	4.357	1.499	1.20				

Significance level (α) = 0.05

Through Table 02, it is evident that the calculated T-values for the three physical attributes are lower than the tabulated T-values at a significance level of 0.05 and with 12 degrees of freedom. This indicates the equivalence of the research sample in the pretests.

2.5. Study Limits

The study limits refer to the framework within which the researchers operate, i.e., the set of variables that will be addressed during the research. These variables must be clearly defined, as failing to do so results in the researchers losing full control over the study **(Mohammed Abdel-Fattah Al-Sirafi, 2005, p. 86).**

a. Temporal Limits:
The researchers conducted the field study between 03/11/2024 and 10/12/2024.

b. Spatial Limits:
The study, including pretests, post-tests, and the training program, was conducted at the Multi-Sports Hall in Chlef.

2.6. Skill Tests

- Shooting test
- Dribbling skill test (Dribbling Course)

2.7. Pilot Study

The pilot study aims to explore the conditions surrounding the phenomenon under investigation and identify key hypotheses that can be tested scientifically (Marwan Abdel-Majid Ibrahim, 2002, p. 38).
This provides the researchers with a foundation for preparing the study and allows them to:

- Select appropriate tests to measure basketball skill performance.
- Identify the psychometric characteristics of the selected tests.
- Assess the research sample's response to the tests.
- Identify potential difficulties in administering the tests.
- Determine the best methods for conducting the tests.
- Ensure compatibility of equipment with the tests.
- Identify appropriate sports materials and tools for testing.
- Prepare administrative documents to allow the tests to be conducted with the selected team.

2.9. Psychometric Properties of the Tests Used

Validity:

Validity refers to the extent to which a test or instrument measures what it is intended to measure **(Fatma Awad Saber & Mirvet Ali Khafaga, 2002, p. 167).** The researchers collected a substantial set of tests measuring skill performance and presented them to a panel of experts for evaluation, refinement, and modification. This constitutes content validity. Additionally, construct validity was calculated using the square root of the test's reliability coefficient.

Reliability:

Reliability refers to the consistency of a test — i.e., the ability to produce similar or identical results when repeated under the same conditions **(Marwan Abdel-Majid Ibrahim, 1999, p. 94).**
The selected tests were applied to the pilot sample, and the Pearson correlation coefficient was used to calculate reliability.

Objectivity:

Objectivity refers to the extent to which test results are not influenced by the scorer's subjectivity or personality, ensuring that a participant receives the same score if the test is scored by different evaluators **(Kheir Allah Owais, 1999, p. 53).** The tests are clear and straightforward, designed by specialists in physical education and sports, easy to understand, unambiguous, and free from subjective interpretation. This ensures that the test items have good objectivity.

The tests were applied to five players from MCB Club in Chlef, and the same tests were repeated one week later under identical conditions. The Pearson correlation coefficient was then used to analyze the results, as shown in Table 03.

Table 03: Shows the validity and reliability coefficients of the physical tests for the pilot study sample.

Skill Test	Sample Size	Reliability Coefficient	Validity Coefficient	Statistical Significance
Dribbling	5	0.93	0.88	Significant
Shooting		0.92	0.85	Significant

Through the statistical analyses, it was observed that all test items demonstrated a high degree of validity and reliability. Table 03 presents the results of the pilot study and highlights their scientific robustness.

2.10. Experimental Design

The control group was subjected to a standard training program, while the experimental group underwent the proposed training program using the technological educational medium (video). The following table illustrates this design:

Table 04: Diagram of the Experimental Design

Group	**Sample Size**	**Pretests**	**Experimental Treatment**			**Post-tests**	**Comparison**
			Program	**Number of Sessions**	**Duration**		
Experimental	07	Pretests were conducted on 12/11/2022	Training program using video	12	4 weeks, 3 sessions per week	Post-tests conducted on 14/12/2022	Comparison between pre- and post-tests for the same group, then between post-tests of control and experimental groups
Control	07		Standard training program				

2.11. Training Program

The researchers conducted a survey of Arabic and foreign books, references, and scientific studies that utilized training curricula and exercises for learning the basic skills of basketball, and subsequently designed the training program.

The program took into account the players' age characteristics and training level (considering they were at the beginning of their sports specialization). It was then presented to a group of specialized experts to ensure the suitability of the program for the players' level and abilities, as well as the validity of its underlying scientific principles. Some items were modified according to the experts' feedback to align with the research objectives and the participants' level. The final version of the program was then prepared for application to both the control and experimental groups, using illustrative videos for dribbling and shooting skills during the application for the experimental group.

3. Presentation and Analysis of Results

3.1. Presentation and Analysis of Pre- and Post-Test Results for the Control and Experimental Groups in Dribbling and Shooting Tests

Table 05 illustrates the pre- and post-test results for the control and experimental groups in the dribbling and shooting tests.

Skill	Group	Test	Mean	± SD	Degrees of Freedom	t-calculated	t-critical	Significance
Dribbling	Experimental	Pre	33.356	1,873	06	8.249	2,650	Significant
		Post	30.809	1,258				
	Control	Pre	33.307	1,453		5.099		Significant
		Post	32.182	1,446				
Shooting	Experimental	Pre	3.928	2,055		7.071		Significant
		Post	6.785	1,050				
	Control	Pre	4.357	1,499		4.770		Significant
		Post	5.357	1,008				

From the results shown in Table (05), we observe the following:

- For the experimental group, the pre-test mean for the dribbling skill was 33.356 with a standard deviation of 1.873, while the post-test mean was 30.809 with a standard deviation of 1.258. The calculated t-test value was 8.249, which is greater than the critical t-value of 2.650 at a significance level of 0.05 with 12 degrees of freedom. These results indicate statistically

significant differences between the pre-test and post-test for dribbling in the experimental group, favoring the post-test.

- For the control group, the pre-test mean for dribbling was 33.307 (SD = 1.453) and the post-test mean was 33.182 (SD = 1.446). The calculated t-test value was 5.099, which exceeds the critical t-value of 2.650 at a significance level of 0.05 with 12 degrees of freedom. These results show statistically significant differences between the pre-test and post-test for dribbling in the control group, favoring the post-test.
- For the experimental group, the pre-test mean for the shooting skill was 3.928 (SD = 2.055) and the post-test mean was 6.785 (SD = 1.050). The calculated t-test value was 7.071, greater than the critical t-value of 2.650, indicating statistically significant improvements in shooting in favor of the post-test.
- For the control group, the pre-test mean for shooting was 4.357 (SD = 1.499) and the post-test mean was 5.357 (SD = 1.008). The calculated t-test value was 4.770, which is greater than the critical t-value of 2.650 at α = 0.05 and 12 degrees of freedom. This confirms statistically significant improvements in shooting for the control group in favor of the post-test.

3.2. Analysis of post-test results for dribbling and shooting skills for the control and experimental groups:

Table (06) compares the post-test results for dribbling and shooting skills between the experimental and control groups.

Skill	Experimental Group		Control Group		degrees of freedom (df)	t (calculated)	t (critical)	Significance
	M	SD	M	SD				
Dribbling	809.30	1,258	33.182	1,446	12	8,654	2,479	Significant
Shooting	785.6	1,050	5.357	1,008		4,163		Significant

From the results presented in Table (06), it is evident that the calculated t-values ((T.test) of 4.163 and 8.654, respectively) are greater than the critical t-value ((T.test) = 2.479) at a significance level of 0.05 with 12 degrees of freedom. This indicates statistically significant differences between the post-tests of the experimental and control groups in the basketball skills under study (shooting and dribbling), in favor of the experimental group. This improvement is attributed to the proposed training program using the technological educational medium (video).

4. Discussion

4.1. Discussion and Interpretation of the First Hypothesis

The first hypothesis states:
"The proposed training program using the technological educational medium (video) affects learning the basketball shooting skill among U15 players."

Based on the results presented in Tables (05) and (06), which highlight the superiority of the experimental group in the shooting test, the researcher attributes the improvement observed in the experimental group to the proposed training program that included video-based correction. This led to an enhancement in the shooting skill for the experimental sample.

The improvement observed in the experimental group compared to the control group is due to the proposed program being more effective than the traditional program followed by the control group. The researcher notes that this outcome aligns with previous studies demonstrating a strong direct relationship between video-based correction and skill development. A training program that relies on video-based correction is one of the fastest and most effective methods for mastering and improving fundamental motor skills.

This aligns with the study by Cyrille Gaudin (2013), titled *"Using Video Tools and Observation in Preparing New Teachers,"* which confirmed improved performance in the experimental group compared to the control group across several verbal and non-verbal competencies. Key findings included:

- Video tools can be integrated with other educational materials, earning the label "comprehensive medium."
- They can be used alongside other resources in multimedia teaching strategies.
- Successful integration with computers allows the design and production of new educational systems, such as interactive videos.

- Technological improvements have reduced size and merged computers with video tools, making them more accessible for high-quality program development if proper training and resources are available.

Thus, the proposed video-based training program had a significant positive impact on the experimental group, more than the traditional program applied to the control group. Accordingly, the first partial hypothesis is confirmed: there are statistically significant differences in shooting skill accuracy in favor of the experimental group due to the use of the video educational medium.

4.2. Discussion and Interpretation of the Second Hypothesis

The second hypothesis states:
"The proposed training program using the technological educational medium (video) affects learning the basketball dribbling skill among U15 players."

From Tables (05) and (06), which show the experimental group's superiority in the dribbling test, the improvement is attributed to the proposed video-based training program. This program included varied dribbling exercises and scenarios, corrected using video, which substantially enhanced the experimental group's dribbling control.

This result aligns with previous research indicating a strong, direct relationship between video-based correction and skill development. Video-supported training is among the most effective methods to develop and enhance fundamental motor skills.

The improvement observed in the experimental group in dribbling compared to the control group is due to the proposed program being more impactful than the traditional program, significantly increasing the experimental sample’s dribbling proficiency.

This finding also aligns with the study by Ben Akki Mohamed Akli and Yousfi Fathi on using audiovisual educational tools in sports training, highlighting their effectiveness in accelerating learning and developing field experience through realistic and challenging scenarios. Advanced countries also rely on such technological tools in training programs, further confirming the validity of the second hypothesis.

5. Conclusion

The study aimed to investigate the effect of a proposed training program using the technological educational medium (video) on learning basketball shooting and dribbling skills among U15 players.

Based on the research results and within the limits of the study sample:

- The proposed video-based training program positively contributes to learning basketball shooting among U15 players.
- The proposed video-based training program positively contributes to learning dribbling skills among U15 players.

Recommendations:

- Consider using video-based educational tools when designing training programs to reduce time and effort while achieving high performance, especially for youth in training centers.
- Conduct similar studies on samples of different ages, levels, and sizes.
- Utilize video-supported training to improve skill performance in both educational and training programs.
- Conduct comparable research on other skills and sports.
- Replicate studies on samples with varying age, skill levels, and sizes.

Bibliography:

- Abidat Mohamed And All,1999, Scientific Research Methodology: Rules, Stages, and Applications, Jordan,2nd ed, Wael Publishing and Distribution House.
- Alsirfi Mohamed Abdelfetah,2005, Scientific Research: An Applied Guide for Researchers, Amman, Jordan,1st ed ,Wael Publishing and Distribution House.
- Awiss Kheireddine,1999, Scientific Research Guide, Cairo,Egypt,Dar Al Fikr Al Arabi.
- Bessiouni Mohamed Awad,Elchati Faycal Yacine,1992, Theories and Methods of Physical Education, Algiers, 2nd ed ,University Publication Office.
- Albik Ali Fahmi, Imadeddine Abouzayed,2003, Sports Coach, Egypt, 1st ed, Publisher of Knowledge.
- Ibrahim Merouane Abdelmajid,2002, Methods and approaches to scientific research in physical education and sports, Amman, International Scientific House for Publishing and Distribution.
- Douaidar Abdelfetah,1993, Psychology of Growth and Development, Beirut ,Dar Al Nahda Al Arabiya.
- Fan Daline,1985, Research Methods in Education and Psychology, 3rd ed., translated by Muhammad Nabil Noufal and others, Cairo, Egyptian Anglor Library.
- Fatima Awad Sabir, Mirvat Ali Khafadja,2002, Foundations and Principles of Scientific Research, Alexandria, Egypt,1st ed, Al-Isha'a Technical Library.
- Gaudin, C، 2013 .L'usage de l'outil video dans la formation par l'observation des enseignants novices – Université de Toulouse II, Le Mirail.
- Jurgen weineck ,1986, manuel d'entrainement,paris, édition vigot.
- Kari Samiha, Abass Abdellah,2005, Using Technology to Promote Citizenship, Baja,Tunisie ,a Study Presented at the Thirteenth Meeting of Educational Leaders.
- Kort Manyl,1980, Motor Learning (Translated by: Ali Eid Naseef), 1st ed, Baghdad,Iraq.

- Kacem Lazem Saber,2009, Preparation Theories and Zone Training in Football, Baghdad, Iraq, 1st ed, Dar Al-Kutub Wal-Watha'iq.

- Maawad Hassan Assayad,1994,Basketball, Cairo, Egypt, 6th ed ,Dar Al Fikr Al Arabi.

- Merouane Abdalmajid Ibrahim,1999, Scientific foundations and statistical methods for testing and measurement in physical education,Ed1, Amman, Jordan, Dar Al Fikr for Printing, Publishing and Distribution,.

- Moufti Ibrahim,1997, Planned training programs for the basketball team, Cairo ,Dar Al Fikr Al Arabi.

- Rabhi Mostapha Alyan, Othman Ghanim,2000, Scientific Research Methods and Approaches, Theory and Application, Amman, Jordan, Safa Publishing House.

- Slamani Mebrouk, Benosmane Abdelmalik Bachir, Variation in Physical Performance among Basketball Players, The Challenge, volume17, numéro02, 2025, pages240-256.

- Zaghebi Ahmed Mohamed,1996, Obstacles to Academic Achievement among College Students in the Kingdom of Saudi Arabia, Risalat Al-Khaleej Al-Arabi Magazine, Issue 87.