

The Impact of Modern Educational Tools on the Assessment of Athletic Behavior in Middle School

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Received: 04/11/2024 ; Accepted: 01/01/2025 ; Published: 28/05/2025

Abstract

The aim of this study was to explore the impact of using modern educational tools on the assessment of educational sports behavior among middle school students. The researchers employed a descriptive approach using an analytical method due to its suitability for the study's objectives and nature. The study was conducted on a sample of (125) middle school teachers affiliated with the Directorate of Education for the Province of East Algiers. A questionnaire was used as a research tool to collect the data and information necessary for the study. The results showed that modern educational tools contribute significantly to improving and evaluating educational sports behavior during physical education classes. These tools also play an effective role in identifying and selecting students with athletic talent. Furthermore, the study demonstrated that modern educational tools contribute to guiding and developing students' educational behavior across various school age groups.

Keywords: Modern Educational Tools; Assessment; Educational sports behavior; Physical education and sports; Middle school.

1. Introduction:

Over recent decades, the educational sector has undergone rapid and fundamental transformations, most notably the integration of modern instructional aids into the learning ecosystem. This system is increasingly grounded in digital interaction and technological integration as a cornerstone for enhancing learning quality and outcomes. Such a shift has reshaped the entire educational landscape, spanning from pedagogical methods to assessment and performance measurement mechanisms.

In this context, the OECD (2021) emphasizes that digital transformation in education actively boosts learner engagement and motivation while tangibly improving measurable outcomes. Furthermore, contemporary educational literature indicates that digital tools play a pivotal role in assessing educational behavior by providing immediate feedback, advanced tracking mechanisms, and fostering positive engagement. Accordingly, García-Fariña et al. (2024) demonstrated that interactive digital tools are among the most effective means of regulating learner behavior and enhancing interaction, particularly in environments merging kinesthetic and social learning, such as physical education (PE) classes.

Conversely, Amin Al-Khouli emphasizes that physical activity must be rooted in solid ethical and pedagogical foundations. Priority should be given to humanistic and value-based considerations across all athletic activities to ensure the achievement of holistic character development (Al-Khouli, 1994, p. 86).

Despite this theoretical and practical significance, the assessment of educational sports behavior still faces a clear gap in systematic implementation within the field. This is particularly evident in middle school—a critical stage for shaping a learner's personality and value system. Consequently,

this study seeks to scientifically examine the impact of modern instructional aids on assessing educational sports behavior among middle school students, aiming to enhance field practices and meet the demands of modern education amidst rapid digital transformation.

2. Research Problem:

The success of the educational system in meeting the demands of development and progress is closely linked to the effectiveness of its management, the quality of educational communication within its various components, and its ability to utilize modern educational tools to improve teaching and assessment practices. In this context, digital educational tools and communication technology have become an essential element in reshaping the educational process, given the interactive capabilities they offer that contribute to improving learning, regulating behavior, and enhancing educational performance (OECD, 2021).

In this regard, UNESCO has emphasized that the integration of technology into education contributes to improving the quality of learning and fostering positive values and behaviors among learners, particularly when it is employed in a purposeful and well-considered educational manner (UNESCO, 2015).

In the field of physical education specifically, modern technology is no longer merely a means of visual presentation or support; rather, it has become an interactive educational tool that contributes to shaping learners' sports culture by reinforcing ethical values and positive behaviors, and improving the quality of motor and cognitive learning. In this regard, recent educational literature indicates that the use of digital media in physical education classes contributes to increasing behavioral engagement and improving the process of continuous assessment (Casey et al., 2017).

Researcher Richard Bailey emphasizes that physical education represents a pivotal educational field in shaping behavior and values, as it is not limited to developing physical abilities alone but extends to fostering social responsibility and self-discipline among learners (Bailey et al., 2013).

Despite this significant theoretical and practical importance, the reality on the ground reveals that the assessment of educational sports behavior among middle school students still lacks sufficient attention, especially given the limited systematic use of modern educational tools in physical education and sports classes, which limits the effectiveness of behavioral assessment and negatively impacts the quality of educational outcomes.

Based on the foregoing, the research problem is articulated in the following main question:

"Do modern educational tools have an effective impact on the assessment of educational sports behavior among middle school students?"

2.1 Sub-questions:

- To what extent are modern educational tools used in the assessment of sports education behavior?
- To what extent do modern educational tools influence the assessment of sports behavior in education?
- To what extent do modern educational tools contribute to the process of continuous assessment and the identification of gifted students?

3. Hypotheses:

3.1 General Hypothesis:

- Modern educational tools have a significant impact on the assessment of students' educational sports behavior in middle school.

3.2 Partial Hypotheses:

- Modern educational tools are used effectively to assess educational sports behavior.
- Modern educational tools have a positive impact on the assessment of educational sports behavior.
- Modern educational tools contribute positively to the process of continuous assessment and the identification of gifted students.

4. Research Objectives:

- To examine the impact of modern instructional aids on the assessment of educational sports behavior among middle school students.
- To determine the role of modern instructional aids in enhancing and regulating the assessment of educational sports behavior during physical education (PE) classes.
- To assess the effectiveness of utilizing modern educational tools in fostering positive behaviors and ethical discipline among students during school sports activities.
- To identify how modern educational tools contribute to improving the accuracy of criteria for scouting and selecting athletically gifted students through continuous behavioral and performance assessment.

5. Importance of Research:

- The significance of this study stems from the rapid technological shifts in the educational sector, which necessitate a re-evaluation of established teaching and assessment methods, particularly regarding a digital-native generation.
- The practical significance lies in empowering PE teachers to adopt more precise and objective assessment tools, enabling them to evaluate student behavior while minimizing subjective bias. This enhances the credibility of assessment, transforming it into an effective diagnostic and guidance tool.
- the study holds social and ethical value by guiding the optimal use of technology to support positive interaction and foster fundamental values like cooperation and discipline.
- Scientifically, this research contributes to the field of PE by clarifying the mechanisms of integrating technology into behavioral assessment, thereby laying the groundwork for future research in this domain.

6. Terminology:

6.1 Modern Educational Tools:

Modern educational tools are defined as an integrated system of digital and interactive tools and technologies used in the educational process to facilitate understanding, enhance interaction, improve the quality of learning, and enhance learning outcomes. These tools include multimedia, digital applications, and e-learning platforms. In this context, the Organization for Economic Cooperation and Development (OECD) has emphasized that integrating technology into education enhances the quality of learning and fosters interaction within the educational environment, which positively impacts achievement and performance (OECD, 2021).

6.2 Evaluation:

In the field of education, evaluation refers to a systematic, organized process aimed at gathering information about learners' learning and performance, with the purpose of making objective judgments and educational decisions intended to improve and develop the educational process. Evaluation is a fundamental pillar of the modern educational system, as it provides continuous feedback that helps teachers and learners identify strengths and weaknesses and work to improve performance based on accurate and measurable data (Brookhart, 2017).

6.3 Educational sports behavior:

Educational sports behavior refers to the set of actions and attitudes that reflect a learner's commitment to ethical and social values while engaging in physical activity, such as self-control, cooperation, respect for opponents, and adherence to the rules of fair play. It is the result of a purposeful educational process that seeks to refine the student's character and develop their sense of values within the school sports environment (Bouzzid, 2021).

6.4 Physical Education and Sports:

Physical education and sports are a comprehensive educational process aimed at developing the physical, mental, social, and psychological aspects of the learner through organized physical and sports activities, thereby ensuring the development of a well-rounded and balanced personality. physical education is an essential component of a quality education system, as it contributes to the development of life skills and the promotion of human and social values among learners (UNESCO, 2015).

6.5 Middle School:

Middle school is an intermediate educational stage situated between elementary and high school; it is also known as early adolescence and is characterized by a critical period of psychological, social, and cognitive development. Educational literature indicates that this stage represents a critical period in the formation of behaviors, values, and attitudes, making it a fundamental focus of any educational initiative aimed at character building and behavioral guidance (UNICEF, 2021).

This stage is considered a sensitive transitional period marking the shift from late childhood to early adolescence, making it a pivotal time in the formation of behaviors, values, and attitudes. The Algerian educational system places great importance on this stage by integrating diverse educational and pedagogical activities, foremost among which are physical education and sports, with the aim of achieving psychological and social balance in students and developing their personalities across various cognitive, motor, and social dimensions. The Algerian Ministry of National Education emphasizes that middle school education aims to ensure the establishment of a common foundation that enables students to acquire basic competencies qualifying them for a successful transition to the secondary education stage (Algerian Ministry of National Education, 2008).

7. Previous and related studies:

7.1 Perelman (2014) conducted a study titled "A Study of the Impact of Formative Assessment in Physical Education Settings," which showed that the use of modern assessment methods and digital assessment in physical education settings enhances learner behavior and classroom discipline. Furthermore, the study demonstrated that continuous assessment via digital tools is a vital mechanism for effectively modifying behavior in school sports.

7.2 UNESCO (2015) conducted a study titled "Quality Physical Education (QPE): Guidelines for Policy Makers," which concluded that physical education is a key area for developing social values and behaviors, such as respect and cooperation. It also demonstrates that the integration of modern educational media enhances educational effectiveness and improves learning outcomes.

7.3 Casey & Macphail (2018) conducted a study titled "Applying a Model-Based Approach in Physical Education: Benefits and Challenges," in which they explored the impact of digitally supported educational models and concluded that digital media significantly enhances student engagement. It also revealed that these tools promote self-discipline and a sense of responsibility by fostering interactive learning environments.

7.4 Goodyear et al. (2021) conducted a study titled “Digital Technology and Physical Education: Opportunities and Challenges in Teaching and Learning,” in which the findings indicated that digital tools—such as educational apps and performance-tracking technologies—effectively increase classroom engagement. These tools promote positive behavior by providing immediate formative assessment and supporting self-directed learning pathways.

7.5 Garcia- Fariña et al. (2024) conducted a study titled “Educational Communication and Digital Tools in Physical Education: A Methodological Perspective“, This recent study concluded that the integration of digital tools supports behavioral assessment through close monitoring and continuous feedback. The authors demonstrated a significant improvement in educational athletic behavior, reinforcing the role of technology as an effective assessment tool in modern education.

8. Research Procedures:

8.1 Research Methodology:

The researchers employed a descriptive approach with an analytical style, as it was appropriate for the study’s objectives and nature.

8.2 Research Population:

The research population consists of (152) male and female physical education teachers at the middle school level who are affiliated with the Directorate of Education in the Province of East Algiers.

8.3 Research Sample:

The research sample consisted of (125) physical education teachers at the middle school level, who were selected using simple random method.

8.4 Research Tool:

the researchers relied on the questionnaire tool to collect the data and information necessary for the study.

8.4.1 Tool stability:

To verify the Tool’s stability, the questionnaire was administered to a pilot sample consisting of 12 professors from outside the original study sample, and the stability coefficient was calculated using an appropriate statistical method. The results indicated that the Tool possesses a high degree of stability, confirming its suitability for field application and the stability of its results.

Table 1: Shows the stability coefficients for the questionnaire dimensions (Cronbach’s alpha)			
Axis	Number of segments	Alpha coefficient	Degree of stability
The Reality of Modern Media Use	5	0.82	High
The Impact of Media on Behavior	5	0.79	Good
The Role of Media in Assessment	4	0.85	High
The Tool as a Whole (Overall Questionnaire)	14	0.82	High stability

Source: the researcher, 2024

As shown in the results presented in Table 1, the Cronbach’s alpha coefficients for the questionnaire’s dimensions ranged from 0.79 to 0.85, while the overall coefficient for the questionnaire as a whole was 0.82. which means that all of them are significant and acceptable values for application purposes,

as the majority of studies demonstrated that the average rate of acceptance of the stability coefficient is (0.60) (Amir & Sonderpandian, 2002).

8.4.2 Validity of the research tool:

Test validity study: We relied on the internal validity of the test to calculate validity.

Internal consistency = the square root of the stability coefficient, i.e., internal consistency = $\sqrt{0.82} = 0.91$. Therefore, the internal consistency of the test is 0.91, which is a good stability coefficient, and we can rely on it in our research.

9. Research Areas:

9.1 Human domain:

The study population consisted of all physical education and sports teachers affiliated with the Directorate of Education in the East Algiers Province at the middle school level.

9.2 Spatial domain:

Public middle schools under the jurisdiction of the Directorate of Education in the province of East Algiers.

9.3 Temporal Scope:

This study was conducted during the 2023–2024 academic year.

10. Research Variables:

- Independent variable:

Modern educational tools.

- Dependent variable:

Assessment of Athletic Behavior in Middle School.

11. Statistical Methods Used:

To analyze the research data and process the questionnaire results, a set of statistical methods appropriate to the nature of the research was employed:

- Frequencies: To determine the number of responses from sample participants for each option in the items.
- Percentages (%): To convert frequencies into percentages to facilitate the reading and interpretation of results.
- Mean: To determine the general trend of the sample's responses regarding the research themes.
- Standard Deviation: To measure the degree of dispersion or consistency in the responses of the sample.
- Chi-square Test (χ^2): Used to detect significant differences between observed and expected frequencies, and to determine whether there is a statistically significant relationship between the study variables and the questionnaire items.
- Cronbach's Alpha: To verify the stability of the research tool and the degree of internal consistency of its items.
- Internal Consistency: Through the square root of the stability coefficient to verify the validity of the tool.

12. Presentation, analysis, and discussion of the results:

12.1 The First Axis: The Reality of Using Modern Educational Tools

"There are technical difficulties (lack of internet access, absence of equipment) that prevent me from using modern tools."

Table 2: shows the frequency distribution, percentages and chi-squared (χ^2) values for the responses to the fifth question							
Answers	Frequency	Percentage	Calculated chi-square χ^2	Critical chi- square χ^2	Degrees of freedom (df)	Significance level (α)	Function
Strongly agree	63	50.4%	110,168	7.81	03	0,05	Statistic al Function
Agree	58	46.4%					
Disagree	4	3.2%					
Strongly disagree	0	0%					
Total	125	100%					

Source: the researcher, 2024

The results of Table 2 show that the majority of the sample tends to agree that technical difficulties hinder the use of modern educational tools. The percentage was 50.4% for the “strongly agree” category and 46.4% for the “agree” category, totaling 96.8% of the total sample. In contrast, the “disagree” category recorded a low percentage of 3.2%, while no percentage was recorded for the “strongly disagree” category.

results of the chi-square test also showed that the calculated value (110.168) far exceeded the critical value (7.81) at a degree of freedom (3) and a significance level (0.05), indicating the presence of statistically significant differences. Therefore, the distribution of responses reflects a genuine trend among the sample participants and is not the result of chance.

These results confirm that technical difficulties represent a real obstacle to the use of modern educational tools in the field of education, as teachers suffer from weak digital infrastructure, whether in terms of the lack or absence of internet networks, or the limited availability of technological equipment and resources within educational institutions.

This situation also reflects a clear gap between modern educational trends that encourage the integration of technology into education and the actual resources available, especially in physical education and sports, which require specific conditions (open spaces, appropriate equipment), making it more difficult to utilize digital tools compared to other subjects.

These findings are consistent with those of the Organization for Economic Cooperation and Development (OECD, 2021), which emphasizes that the success of digital transformation in education depends on the availability of robust infrastructure and ongoing technical support. They also align with reports from UNESCO (2015), which identifies a lack of digital resources as one of the most significant challenges hindering the integration of technology, particularly in developing countries.

Therefore, improving the use of modern educational tools requires a comprehensive approach that includes providing equipment, developing communication networks, and promoting ongoing teacher training, thereby ensuring the effective use of these tools in the educational process.

12.2 The second Axis: The Impact of Modern Technology on Athletic Behavior

“Modern technology provides immediate feedback that helps students correct their behavior.”

Table 3: shows the frequency distribution, percentages and chi-squared (χ^2) values for the responses to question 09							
Answers	Frequency	Percentage	Calculated chi-square χ^2	Critical chi-square χ^2	Degrees of freedom (df)	Significance level (α)	Function
Strongly agree	89	71.2 %	160,024	7.81	03	0,05	Statistic al Function
Agree	31	24.8 %					
Disagree	5	4%					
Strongly disagree	0	0%					
Total	125	100%					

Source: the researcher, 2024

The results of Table 3 show that the majority of the sample strongly agree that modern educational tools provide immediate feedback that helps students correct their behavior. The percentage for the “strongly agree” category was 71.2%, and 24.8% for the “agree” category, totaling 96% of the sample. In contrast, the “disagree” category recorded a low percentage of 4%, while no percentage was recorded for the “strongly disagree” category.

The results of the chi-square test also showed that the calculated value (160.024) far exceeded the critical value (7.81) at a degree of freedom (3) and a significance level (0.05), indicating the presence of statistically significant differences. This confirms that the sample’s tendency toward agreement is genuine and not random.

These results confirm the effective role of modern educational tools in improving educational sports behavior by providing immediate and real-time feedback, allowing students to correct their mistakes and adjust their behavior in a timely manner. Immediate feedback contributes to enhancing self-directed learning and increases attention and discipline during class, particularly in practical activities such as physical education and sports.

This finding also reflects teachers’ awareness of the importance of integrating technology into the educational process, not only as a presentation tool but as an effective assessment tool that supports continuous learning and improves students’ motor and behavioral performance.

These findings are consistent with those of a study by Goodyear et al. (2021), which confirmed that the use of digital technology in physical education enhances interaction and provides real-time feedback that positively influences learners’ behavior. They also align with recent educational literature, which considers immediate feedback to be one of the most important factors contributing to improved learning and behavior management within the classroom.

Consequently, the effective use of modern educational tools can bring about a positive transformation in physical education behavior, provided that the necessary resources are made available and teachers are trained to use them in a pedagogically sound manner.

12.3 The third Axis: Formative Assessment and Identification of Gifted Students

“Technology-supported assessment helps reduce subjectivity (teacher bias) when evaluating behavior.”

Table 4: shows the frequency distribution, percentages and chi-squared (χ^2) values for the responses to question 12							
Answers	Frequency	Percentage	Calculated chi-square χ^2	Critical chi-square χ^2	Degrees of freedom (df)	Significance level (α)	Function
Strongly agree	64	%51.2	107,224	7.81	03	0,05	Statistical Function
Agree	56	%44.8					
Disagree	5	4%					
Strongly disagree	0	0%					
Total	125	100%					

Source: the researcher, 2024

The results of Table 4 show that the majority of the sample clearly tend to agree that technology-enhanced assessment contributes to reducing subjectivity (teacher bias) when evaluating behavior. The percentage was 51.2% for the “strongly agree” category and 44.8% for the “agree” category, totaling 96% of the sample, a high percentage reflecting near-unanimous agreement. In contrast, the “disagree” category recorded a low percentage of 4%, while no percentage was recorded for the “strongly disagree” category, reinforcing the strength of the general trend toward support.

The results of the chi-square test also showed that the calculated value (107.224) significantly exceeds the critical value (7.81) at a degree of freedom (3) and a significance level (0.05), indicating the presence of statistically significant differences. Consequently, the sample’s tendency toward agreement is considered a genuine and statistically significant trend, not a result of chance.

The survey results reveal a notable consensus among teachers that the use of modern educational tools in the assessment process effectively contributes to reducing self-assessment and personal bias, and lends the assessment process a more objective, accurate, and fair character.

This finding highlights the significant importance of digital technology in promoting the principles of fairness and transparency in educational assessment, as it relies on measurable objective data—such as video recordings, performance-tracking technologies, and digital records—rather than personal judgments that may be influenced by subjective factors.

In this context, a study (García-Fariña et al., 2024) confirmed that digital tools contribute to improving assessment accuracy and reducing bias, thereby enhancing the credibility and objectivity of behavioral assessment.

The use of technology also makes it possible to track a student's progress over the long term in a systematic and accurate manner, which supports the identification and selection of athletic talent based on objective scientific criteria.

13. Conclusion:

* The study's findings demonstrated that modern educational tools, in their various digital and interactive forms, contribute effectively to improving students' educational sportsmanship, as they promote self-discipline and reinforce ethical values such as respect for rules, cooperation, and fair play, as well as fostering sportsmanship within the school environment.

* The study also revealed that these tools offer advanced assessment capabilities by providing immediate and accurate feedback, which helps students correct their behavior during physical activity and contributes to the development of self-directed learning while simultaneously improving motor and emotional performance.

* In terms of the overall teaching and learning process, modern educational tools play a prominent role at both the learner and teacher levels, as they facilitate the demonstration of motor and behavioral models, improve teaching methods, and contribute to the identification of gifted students by tracking and analyzing their performance objectively and with precise methodology.

14. Research Recommendations:

➤ **Systematic Integration:** Promote the structured use of modern instructional aids in PE to foster moral values and ethical sports behavior.

➤ **Infrastructure Development:** Prioritize the provision of digital hardware (projectors, tablets, and high-speed internet) within schools to ensure sustainable technology use.

➤ **Professional Development:** Launch specialized training programs for PE teachers focused on digital pedagogy and technology-based assessment.

➤ **Digital-Based Assessment:** Incorporate video analysis and specialized apps into daily PE practices to ensure objective behavioral monitoring.

➤ **Digital Literacy:** Raise students' awareness regarding the responsible and productive use of technology in sports.

➤ **Scientific Talent Scouting:** Utilize digital tracking to identify and monitor gifted students based on objective skill and behavioral metrics.

➤ **Virtual Pedagogical Alternatives:** Use interactive models and simulations as effective teaching alternatives when outdoor facilities are inaccessible.

➤ **Stakeholder Collaboration:** Strengthen ties between educational institutions and sports bodies to create a tech-supported learning environment.

➤ **Value-Centric Technology:** Focus on utilizing digital media to instill sportsmanship, respect for regulations, and social solidarity.

➤ **Future Research:** Encourage further longitudinal studies across primary and secondary education levels to build a comprehensive scientific database on digital integration in PE.

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