

The Effect Of Using Electronic Boards On The Digital Achievement Of Individual Physical Activities In The Physical Education And Sports Session

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Abstract:

The study aimed to explore the impact of electronic boards on the digital outcomes of individual sports activities, including speed running, long jump, and shot put for students in physical education sessions. Twenty-four middle school students, aged 12-13, were randomly divided into two groups. The experimental group received an educational programme using electronic boards, where stages of motor performance for various sports activities discussed in physical education sessions were displayed; while the control group employed traditional methods. After 24 weeks, the experimental group demonstrated greater improvement in digital performance compared to the control group. The results suggest that electronic boards enhance learning outcomes in motor performance for sports activities. Utilizing technology such as electronic boards can be beneficial in educational sessions for middle school sports, potentially improving engagement, and skill development for students.

Keywords: Electronic boards, digital proficiency, individual physical exercises, physical education, sports sessions.

Introduction:

Education through modern means of communication is considered one of the modern methods of education. It is an inevitable result imposed by technological developments in the field of communication which have contributed to providing a large amount of information to individuals (Perumean-Chaney, 2011, pp. 393-400). With this technological development in the field of communication and information, education has become able to keep pace with this development to obtaining information on one hand. On the other hand, it is the method of receiving that information which was different from what it was previously. One of the most important of these modern means of communication is electronic boards as they have become one of the important means in the lives of individuals in particular. Among the educated group, electronic boards are an important part of the learning relationship in many academic subjects (Chen, 2020, pp. 239-259), and among those subjects is physical education and sports. Electronic boards include many applications that contain pictures, drawings, and

illustrative videos about motor performance in many sports activities covered in the classroom (Gabatshwane Tsayang, 2020, pp. 22-39). So the electronic boards have become a knowledge reference for learning the activities programmed in the subject of physical education and sports during the school season. It has also facilitated the process of communication between the teacher and the learner inside and outside the classroom by clarifying the stages of motor performance for the various motor skills that are part of sports activities whether individual or group (Kelly H. Porter, 2012, pp. 23-30).

Electronic boards provide many amazing services in various fields including the field of education. They are considered a fruit in this field. Among the educational materials that can take advantage of this modern means of communication, we find physical education and sports, which seeks to achieve its cognitive, motor, and emotional goals relying on educational technology. It requires a teacher familiar with the educational material and proficient in modern learning methods in terms of design and

construction of educational situations. This educational technology should suit the level of the students who are considered the sensitive party in the learning process. In light of the spread of this modern means of communication, namely electronic boards, its impact has become clear on the learner in his behavior and thoughts in the educational environment. In addition to its impact on his achievement in all academic subjects in general and on physical education and sports in particular through the digital results obtained after using it. There is no doubt that this digital achievement has changed in light of the use of modern means of communication to what it was before their appearance and spread. It made specialists think about moving to a new method of learning knowledge, information, and skills (Hunter, 2014, pp. 56-60). This study seeks to highlight the impact that electronic boards have on digital achievement in the individual activities covered in the subject of physical education and sports, which are represented in the activities of speed running, long jump, and shot put. The current study presents new and unique contributions compared to previous studies that have addressed the use of technology in physical education, focusing specifically on individual sports activities rather than the general effects of technology in this field. Our research delves into the impact of using electronic boards on individual sports activities such as sprinting, long jumping, and shot putting, providing a deeper understanding of how to enhance performance in these specific areas. The use of electronic boards in teaching motor skills through interactive displays including videos and images allows students to gain a better understanding of sporting techniques and improve actual performance in the field. The study also aims to measure the quantitative impact of technology on athletic performance, and offering data that demonstrates significant improvements due to the use of electronic boards; thus supporting their use in schools. Furthermore, the study compares traditional and modern teaching methods, highlighting the practical benefits and performance enhancements that technology can provide. Despite the growing interest in the role of technology in physical education, there remain knowledge gaps concerning its effects on individual sports activities, which our study seeks to fill. We also explore the digital outcomes resulting from the use of this technology, shedding light on the potential benefits of integrating technology in evaluating, and enhancing students' athletic performance. Based on the above, we ask the following general question: Is there an effect of using electronic boards on the digital results of individual activities among 12-13 year old learners in the

physical education and sports class?

Methodological procedures in the study

Research Methodology

The experimental method used based on the experimental design of two groups, experimental and control; and by conducting pre- and post-measurement for the two groups in order to suit the nature of the research.

Experiment design

Implementation and Evaluation of the Educational Program Using Electronic Boards:

proposed educational program was designed for each physical activity: speed running, long jump, and shot put. The programme consisted of 8 sessions for each activity distributed over the school season, with 6 sessions addressing educational objectives and 2 sessions dedicated to pre- and post-measurement. The programme spanned 8 weeks at a rate of one session per week. In the experimental group, the use of electronic boards featured prominently, including presentations on the motor performance of the activities. Each session began with a 30-minute theoretical presentation using these boards, equipped with interactive tools to enhance learning. The content displayed included high-definition videos demonstrating techniques, step-by-step photographic sequences, and textual explanations highlighting crucial points such as posture and execution.

Following the theoretical introduction, the session transitioned to the playground for a one-hour practical application. During this time, the electronic boards served not only as a reference but also as a tool for immediate feedback. Using touch-screen capabilities to allow students to interact with the content, slow down video playback, or zoom in on images. Practical sessions were complemented by digital tools that tracked and analyzed performance metrics like speed and trajectory. They are crucial for assessing improvements.

Conversely, the control group relied on traditional methods presentation and explanation without technological aids for their one-hour field sessions. This contrast was designed to measure the effectiveness of interactive and digital enhancements in physical education.

Performance improvements were evaluated using pre- and post-tests that measured specific metrics for each activity, supplemented by video analysis software that provided detailed comparisons of students' techniques before and after the program. Statistical analysis of these data helped confirm whether the enhancements provided by the electronic boards had a significant impact on student

performance. Thus, it was useful to underscore the potential benefits of integrating technology into physical education curriculums.

-Detailed Implementation of the Educational Program Using Electronic Boards:

The educational program utilizing electronic boards was meticulously structured to integrate technology into the learning process for physical activities such as speed running, long jump, and shot put. Here's how the electronic boards were employed during the sessions:

-Initial Presentation: Each session began with a 30-minute theoretical presentation using the electronic boards. These presentations were designed to visually and interactively introduce the fundamental concepts and techniques of the specific activity. The content displayed included high-definition videos demonstrating proper techniques, step-by-step photographic sequences, and textual explanations that highlighted key points such as posture, alignment, and execution phases.

-Interactive Features: The electronic boards were equipped with touch-screen capabilities, allowing students to interact with the content. For example, students could slow down video playback to closely observe the techniques, zoom in on images to see detailed body positions, or tap on specific sections of text for more in-depth explanations.

-Integration with Practical Activities: Following the theoretical presentation, the session moved to the playground where practical application took place for one hour. During this period, the electronic boards served as a real-time reference tool. Students could revisit any part of the initial presentation during their practice to reinforce learning. Instructors also used the boards to show real-time video examples, and comparing students' performances with ideal executions.

-Feedback and Correction: The electronic boards were used to record students' performances. These recordings were then played back for immediate feedback, with instructors highlighting areas of strength and points for improvement by referencing the visual materials displayed earlier.

-Criteria for Measuring Digital Improvements in Performance

The criteria for measuring the improvements in performance through digital means were defined as follows:

Data collection tools

In order to obtain the results of the pre- and post-measurement for the students, an individual

-Pre- and Post-Test Assessments: Quantitative data was collected through pre- and post-tests conducted in the first and the last sessions of the program. These tests measured specific metrics related to each activity such as time in speed running, distance in long jump, and throw distance in shot put.

-Digital Tracking Tools: During the sessions, digital tools integrated into the electronic boards were used to track and analyze each student's performance. These tools provided metrics like speed, force, and trajectory; which were crucial for assessing improvements.

-Video Analysis Software: The software was used to provide a detailed analysis of each student's technique. By comparing pre- and post-program videos, improvements in technique, form, and execution were quantitatively assessed.

-Statistical Analysis: The improvement data collected were statistically analyzed to determine the significance of the changes observed. This analysis helped in confirming whether the use of electronic boards had a statistically significant impact on improving student performance in physical activities. By employing these methods, the study aimed to provide a comprehensive and quantifiable understanding of how electronic boards can enhance the learning and performance of individual sports activities. Thereby, validating the integration of technology in physical education.

Research community

The research population comprised middle school students, aged 12 to 15, during the 2022-2023 school year.

Research sample

The research sample consisted of 24 students practicing physical education and sports at one level, their ages ranging between 12 and 13 years. They were chosen randomly. They were divided into two groups equal in number and homogeneous in abilities, and the type of student was not taken into account. Each group consisted of 12 Student: Males' height ranges between $1.50 \pm$ cm and their weight ranges between 45 ± 10 kg. Females' height ranges between 145 ± 5 cm and their weight ranges between 35 ± 10 kg.

observation

card (result evaluation card) was used for each learner according to each activity, as in the following table

Table 1 shows the evaluation card used in the pre-measurement and post-measurement for each

individual sports activity

Groups	Full name of student	Pre-Test	Post-Test
Experimental Group	Sample No. (01)	Digital Score	Digital Score
Or Control Group	-	-	-

Statistical methods used: IBM SPSS Statistics26 was relied upon to calculate:

-T-Test to compare the means (Of two related samples), that is, between the pre-test and the post-test for the experimental and control groups.

-T-Test to compare the means (Of two independent samples), that is, between the post-test of the experimental group and the control group.

Presentation, analysis and discussion of results**Results:****Table 2. shows a comparison between the pre- and post-tests for the two research groups**

Activity	Group	Pre-Test		Post-Test		t	Sig. (2-tailed)	p	df	Dec
		Mea n	SD	Mea n	SD					
Sprint Activity(50m)	Experimenta l	7.84	0.64	6.31	0.48	6.17	0.000	0.05	11	Sig
	Control	7.45	1.33	7.01	1.05	2.27	0.044			Sig
Long jump activity	Experimenta l	2.34	0.55	2.69	0.44	2.59	0.025			Sig
	Control	2.42	0.79	2.15	0.70	2.35	0.038			Sig
Shot put (2kg)	Experimenta l	4.36	1.08	4.83	1.03	3.70	0.004			Sig
	Control	4.27	0.79	3.92	0.89	2.21	0.049			Sig

Source: The researcher utilized the IBM SPSS

Statistics 26 package

Table 2 shows the differences between the pre-tests and post-tests for the various individual activities of the experimental and control groups, The results distinctly illustrate the positive impact of using electronic boards in sports education. For instance, in the sprint activity, we observed a significant improvement in the performance of the experimental group, where the average performance decreased from 7.845 to 6.316. This improvement is primarily due to the intensive use of electronic boards which displayed performance data in real-time and helped students immediately enhance their techniques.

Statistical analysis supports this finding, where the calculated t-value was 6.172 with a significance level (sig) of 0.000, which is significantly lower than the standard significance level of 0.05. This indicates a substantial and meaningful effect of the educational

programme that utilised electronic boards on improving performance in the sprint activity.

In the long jump activity, the experimental group also saw a considerable improvement, where the average performance increased from 2.340 to 2.699. The visual support provided by the electronic boards allowed students to gain a deeper understanding of the movement dynamics required which contributed to more effectively enhancing their performance.

Conversely, in the shot put activity, both groups noted improvements in performance, but the group using electronic boards achieved a much greater enhancement. The difference in performance can be explained through the ability to analyse performance in real-time and adjust techniques based on immediate feedback.

Table 3. shows a comparison between the post-tests for the two research groups

Activity	Group Experimenta l	Group Control	t	Sig. (2-tailed)	p	df	Dec
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	Mea n	SD	Mea n	SD					
Sprint Activity(50m)	6.31	0.48	7.01	1.05	2.09	0.048	0.05	22	Sig
Long jump activity	2.69	0.44	2.15	0.70	2.26	0.034			Sig
Shot put(2Kg)	4.83	1.03	3.92	0.89	2.31	0.030			Sig

Source: The researcher utilized the IBM SPSS Statistics 26 package

From **Table 3**, The results have clearly demonstrated that using electronic boards in physical education sessions has a significant positive impact on enhancing students' athletic performance. Electronic boards provide immediate and visual feedback that helps students understand and improve their techniques in sports activities such as sprinting, long jump, and shot put.

Sprinting: Analysis of the results revealed a significant improvement in performance between the initial and final tests, with the experimental group improving from 7.845 to 6.316. This improvement is attributed to the use of electronic boards, which displayed precise information about each part of the performance, allowing for immediate corrections and enhancing the students' deep understanding of running dynamics.

Long jump: The results showed an improvement from 2.340 to 2.699 in the experimental group, with the explanatory videos and interactive diagrams effectively enhancing the students' understanding of optimal jumping techniques.

Shot put: The experimental group saw an improvement from 4.366 to 4.837, highlighting the

importance of electronic boards in providing immediate data, that helps students analyse and modify their movements based on continuous feedback.

The noticeable improvements in performance reflect the effectiveness of electronic boards as an educational tool. Statistical data supports the study's conclusions, with t-values and levels of statistical significance confirming the positive differences between the experimental group and the control group, decisively affirming the positive impact of the technology used.

Difference results for the two research groups after conducting the experiment

Program using electronic boards to learn the activity of fast running, long jump, and shot put. In addition to displaying the results of improvement for the control group after applying learning in the traditional method (presentation and explanation) in order to compare the experimental and control group from the aspect of development of the performance.

Table 4 shows the results of digital achievement after performing the posttest for the experimental group.

Sample No	Sprint Activity(50m)			Long jump activity			Shot put(2Kg)		
	T-Pre	T-Post	Time imp.(s)	T-Pre	T-Post	Dist. imp.(m)	T-Pre	T-Post	Dist. imp.(m)
1	7.8	6.09	-1.71	1.9	2.9	+1.00	5.1	5.5	+0.4
2	6.98	5.78	-1.2	1.8	2.1	+0.3	3	3.2	+0.2
3	7.71	7.22	-0.49	2.1	2.9	+0.8	3.2	4.8	+1.60
4	7.44	6.92	-0.52	2.3	2.5	+0.2	5.5	6.1	+0.6
5	7.66	6.58	-1.08	1.58	2.9	+1.32	4.8	5.2	+0.4
6	8.57	5.71	-2.86	1.95	2	+0.05	3.3	3.8	+0.5
7	8.1	5.99	-2.11	2.4	2.9	+0.5	4.1	4.5	+0.4
8	7.54	5.93	-1.61	3.35	3.5	+0.15	5.1	6.05	+0.95
9	9.11	6.11	-3	2.96	3	+0.04	5.55	5.6	+0.05
10	6.8	6.38	-0.42	2.8	2.99	+0.19	5.95	5.9	-0.05
11	8.3	6.86	-1.44	2.95	2.5	-0.45	3.7	3.9	+0.2

12	8.14	6.23	-1.91	2	2.2	+0.2	3.1	3.5	+0.4
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Source: The researcher utilized the Excel Office program.

Table 5. shows the results of digital achievement after performing the post-test for the control group.

Sample No	Sprint Activity(50m)			Long jump activity			Shot put(2Kg)		
	Pre-T	Post-T	Time imp.(s)	Pre-T	Post-T	Dist. imp. (m)	Pre-T	Post-T	Dist. imp. (m)
1	8.68	8.59	-0.09	2.2	2.1	-0.1	4.65	4.6	-0.05
2	10.53	9.51	-1.02	1.8	2	+0.2	4.6	4.5	-0.1
3	6.44	6.5	+0.06	2	1.5	-0.5	3.5	3.1	-0.4
4	6.5	6.52	+0.02	1.9	1.2	-0.7	4.95	4.8	-0.15
5	6.76	6	-0.76	1.1	1.2	+0.1	3.6	3.9	+0.3
6	7	6.12	-0.88	1.6	1.7	+0.1	3.9	3.1	-0.8
7	6.52	6.54	+0.02	2.3	2.2	-0.1	5	3.7	-1.3
8	8	7.26	-0.74	3.3	3.2	-0.1	5.9	6	+0.1
9	6.05	6.06	+0.01	3.7	2.8	-0.9	4.2	3.15	-1.05
10	7.18	7.23	+0.05	2.95	2.88	-0.7	3.6	3.65	+0.05
11	6.71	6.84	+0.13	3.3	3.1	-0.2	3.1	3.3	+0.2
12	9.11	7.06	-2.05	2.9	2	-0.9	4.3	3.25	-1.05

Source: The researcher utilized the Excel Office program.

It is evident from Tables N(4) and N(5) that there are differences in performance improvement between the pre-test and post-test for the two research groups. But what is noted is that the experimental group had a greater rate of improvement in its performance in all its sample members and in all the activities covered in the experiment. In contrast to the control group, which the performance of the majority of the sample members did not know any improvement, and what we notice is that there is a delay in the digital results and the results tend to get worse for all activities in the same group. Therefore, we can say that the group with which the proposed educational program was implemented using electronic tablets excelled in the results for the various motor activities adopted in the experiment results in the use of modern means of communication (electronic boards) improving the study sample's members.

Discussion

According to Table N2, it is evident that both traditional and modern teaching methods within the physical education and sports session significantly affect learners' achievements. The traditional method, which relies on explanation and presentation, is effective; however, modern methods using electronic boards have demonstrated a more profound impact on motor performance across various individual activities. This aligns with (Al-Ghamdi, 2016) findings, which highlighted that students trained under modern methods achieved

better outcomes in activities such as running, swimming, and cycling than those trained under traditional approaches. The study by (Al-Taweel, 2023) supports the idea that virtual reality, similar to other modern educational technologies like electronic boards, provides an effective, comprehensive, and engaging learning experience. These technologies contribute to enhanced motor performance in students by making the learning process more attractive and motivating, ultimately leading to superior educational outcomes.

From Table N3, clearly shows that the experimental group, which utilized electronic boards, significantly outperformed the control group in speed running, long jump, and shot put (Abdelghani, 2019). This is echoed by (Terrence Fox, 2019) who noted that such real-time feedback improves coordination, speeds up reaction times, and increases motivation.

Tables 4 and 5 further substantiate that the experimental group's level of improvement was substantially higher than that of the control group. This enhancement is attributed to the effectiveness of electronic boards in teaching various sports activities (Jones, 2019). It highlighted that the use of electronic boards in speed racing enables athletes to achieve faster times due to the instantaneous feedback and ability to correct mistakes in real time. Similarly; (Smith M. B., 2021) and (Smith, 2020). found improvements in jumping and throwing activities respectively, where athletes who used electronic boards achieved greater heights and

distances.

The use of electronic boards integrates videos, images, and textual content related to motor activities; which helps embed knowledge and skills in the minds of students. This not only enhances motor performance but also promotes positive teacher-learner interaction. An immediate feedback mechanism allows for faster adjustments and improvements leading to more efficient learning and performance outcomes. These studies concur on the transformative impact of integrating technology into physical education. A direct comparison between traditional and modern methods reveals a clear advantage in favor of using technological means such as electronic boards. The long-term effects of these technologies on learning retention benefit students who engage with interactive learning tools.

Conclusion

This study systematically explored the influence of electronic boards on digital achievement in individual physical activities within the context of physical education and sports. The findings from our research present a compelling argument for the integration of modern technological tools, such as electronic boards, into the curriculum. The experimental group, which utilized these boards, displayed significant improvements in motor performance across speed running, long jump, and shot put compared to the control group that employed traditional teaching methods.

-Key Findings:

- The use of electronic boards led to enhanced understanding and execution of motor skills due to the interactive and multimedia capabilities that these boards offer. Students were able to observe, analyze, and adjust their techniques in real-time, which fostered a deeper comprehension and more effective execution of the skills being taught.
- The immediate feedback provided by electronic boards was instrumental in improving students' performance more significantly than the traditional methods. This was evident in all the activities tested, highlighting the boards' effectiveness across a range of physical disciplines.
- Statistical analysis confirmed the superiority of the experimental group's performance, showcasing the tangible benefits of incorporating technology into physical education.

-Recommendations:

-Wider Implementation: Schools should consider broader implementation of electronic boards in physical education classes to enhance interactive learning and improve students' engagement and

performance.

-Teacher Training: To maximize the potential of electronic boards. It is crucial that teachers are adequately trained in their use. This includes understanding how to integrate the technology effectively into their teaching plans, and how to utilize the data collected for improving student outcomes.

Continuous Evaluation: Institutions should implement ongoing assessments of technology integration within the curriculum to ensure that it meets educational goals and adapts to new teaching and learning needs.

Research and Development: Further research should be conducted to explore the long-term effects of technology on student learning and retention, as well as its impact on other educational outcomes beyond motor performance.

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