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The Impact of Educational Platforms on the Educational Process for Students of Physical and Sports Activities Sciences and Technologies in Light of Some Variables

A Field Study Students at Sétif 2 University

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Abstract:

This study aims to explore the impact of digital educational platforms on the educational process among students specializing in Physical and Sports Activities, Sciences, and Technologies at Sétif 2 University in light of certain variables. A descriptive methodology was adopted, and a questionnaire comprising three dimensions (cognitive, affective, and psychomotor) was utilized as the primary data collection instrument for a randomly selected sample of 30 students. The results indicated that educational platforms had a moderate effect overall. This evidence shows that these platforms are not perfect for helping develop motor skills and hands-on experience, which are important in applied fields. Furthermore, we observed no statistically significant differences based on academic level, suggesting a relative homogeneity in students' digital competencies. The study recommends the adoption of hybrid learning models.

Keywords: Educational platforms, Educational process, Sports science students.



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1. INTRODUCTION

Over the past decade, higher education has undergone a qualitative transformation due to integrating digital educational platforms into the teaching and learning process. This shift has generated new pedagogical opportunities and perspectives, particularly during times of crisis, such as the COVID-19 pandemic, which compelled universities to adopt alternative instructional approaches, including distance and hybrid learning models. In this situation, important questions have arisen about how well these methods work in practical and physical fields, like the sciences and technologies of physical and sports activities, where theoretical knowledge is naturally linked to practical skills.

These educational platforms have played a significant role in reshaping the dynamics of teaching and learning by enhancing interaction, providing access to a wide array of digital resources, and introducing innovative platforms such as Moodle. This evolution has gradually shifted educational practices away from traditional methods in favor of more modern, learner-centered pedagogical approaches. However, this transformation has not been without challenges, many of which are linked to the contextual constraints of the educational environment—particularly in disciplines that heavily depend on sensorimotor interaction. Transmitting practical skills through digital media remains a considerable challenge in such fields. Previous studies (Kaya et al., 2021; Kostova, 2022) have revealed that students struggle to acquire motor skills and engage in physical interaction when using distance learning modalities. This finding raises important questions regarding the alignment of these platforms with the specific pedagogical requirements of physical education. In response, (Iuliano et al., 2021) note that this problematic transition has forced educators to rethink their instructional strategies and adapt to online workshops, with students reporting varying satisfaction levels.

In contrast, some researchers (Gümüş & Gençoğlu, 2020; Jeong & So, 2020) say that using interactive learning tools like educational games and quizzes can help students understand difficult ideas in sport sciences, but only if they are used with the right teaching methods.

Moreover, certain variables—such as digital literacy, technical support, and social belonging—play a critical role in determining the effectiveness of platform usage by both instructors and students. Recent research (Sellami et al., 2024) has

shown the importance of the organizational environment in making it easier for educational technologies to be used. This evidence shows the importance of looking at these factors when studying how these platforms affect education.

Furthermore, new research (Ratcliffe & Tokarchuk, 2021; Wei et al., 2024) shows that using augmented reality (AR) and immersive virtual reality (IVR) technologies which involve sensorimotor interaction can lower cognitive load and improve understanding, even though it is still difficult to measure motor interaction.

This study aims to bridge a knowledge gap related to understanding the impact of educational platforms on the learning process among students specializing in the sciences and technologies of physical and sports activities in light of certain variables. The significance of this research lies in both its theoretical and practical contributions. Theoretically, it advances the literature on technology-enhanced learning within applied disciplines. Practically, it aligns with current transformations in higher education, where universities are increasingly mandating standardized digital platforms (such as Moodle). This shift raises important questions regarding how much such platforms align with the specific pedagogical requirements of physical education as a discipline.

Building upon this framework, the central research question posed by this study is as follows:

To what extent do digital educational platforms contribute to supporting academic achievement and developing motor competencies among students of the sciences and technologies of physical and sports activities, in light of certain variables?

2. Methods

2.1 Study design and participants:

This study adopted a descriptive research methodology. The sample consisted of students from the Department of Physical Education at the University of Sétif 2. A random sample of 30 students majoring in the Sciences and Technologies of Physical and Sports Activities (STAPS) was selected to participate in the study.

2.2 Pilot Study:

A pilot study, acting as a preliminary investigation, is conducted by researchers on a sample prior to the main research endeavor. The objective is to refine the research methods and instruments, optimize the testing procedure, and ascertain the reliability of the measures. This process ensures that the subsequent study yields accurate and valid results. In adherence to established scientific methodology, a pilot study was deemed necessary to be conducted within fitness



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facilities. This preliminary investigation aimed to evaluate the validity and reliability of the measurement instruments used in the research, in addition to identifying various and contextual challenges that might arise during the application phase. The specific objectives of this pilot study were to: Gain a better understanding of the target population within the context of the study, and identify potential problem and obstacle that the researcher may encounter during the administration of the measurement instrument.

2.3 Research Instruments:

This study aimed to examine the impact of educational platforms on the learning process among students in the Department of Sciences and Technologies of Physical and Sports Activities at the University of Sétif 2 and to explore students' attitudes toward this mode of education. To achieve this objective, the study instrument was designed as a questionnaire developed by reviewing previous studies related to the topic.

Questionnaire:

The questionnaire served as the primary instrument for data collection in this study. It was designed to obtain the necessary information from the selected sample and was structured around three main dimensions aligned with the study's hypotheses. Each dimension comprised questions specifically tailored to explore that particular aspect.

Cognitive Dimension: Consisting of five questions.

Affective Dimension: Consisting of five questions.

Psychomotor Dimension: Consisting of five questions.

We rated the questionnaire items using a three-point Likert scale as follows:

Always	Sometimes	Never
3	2	1

2.4 The Psychometric Properties of Measurement Instruments:

Intrinsic Validity (Self-Validity):

Intrinsic validity refers to the internal validity of the test. It represents the extent to which the observed scores approximate the actual scores, free from measurement errors. We calculate it by taking the square root of the test's reliability coefficient. Given the scale's reliability coefficient of 0.99, we calculate the intrinsic

validity coefficient as follows:

Intrinsic Validity Coefficient = $\sqrt{\text{Reliability Coefficient}}$

Intrinsic Validity Coefficient = 0.9962

This value indicates a statistically significant and highly valid measure.

Reliability: Test-Retest Method

Total Score	Sample Size	Reliability Coefficient
Questionnaire	30	0.9926

We assessed the instrument's reliability using the test-retest method. As shown in the table, the Pearson correlation coefficient was 0.9926, which is considered a high value. This value indicates that the instrument demonstrates a high level of reliability.

2.5 Statistical analysis:

was conducted using SPSS software. Specifically, the statistical methods employed in this study include: the arithmetic mean, the standard deviation, and Pearson's correlation coefficient.

3. Presentation and discussion of the study results:

3.1 Presentation and Discussion of the First Hypothesis Results:

Educational platforms have a high impact on students of physical and sports activities, sciences, and technologies.

Table (2) illustrates the differences in the impact of educational platforms on students of physical and sports activities, sciences, and technologies.

Sample Size	Mean Score	Standard Deviation	Minimum	Maximum	Total Score
30	29,1	5,09	18	41	872

Based on Table 2, the mean score for the impact of educational platforms on students in the sciences and technologies of physical and sporting activities is 29.1, with a standard deviation of 5.09. The minimum recorded score was 18, while the maximum was 41. We divided the variable into three homogeneous categories to



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determine the level of impact—low, moderate, or high. Accordingly, the scale key is defined as follows:

Table (3) represents the level of impact of educational platforms on the educational process:

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41 - 33,34	33,34 - 25,67	25,67 - 18
High Influence	Moderate Influence	Low Influence

The total range of the scale (i.e., the difference between the maximum and minimum values: $41 - 18 = 23$) was divided into three approximately equal intervals, with each interval measuring about 7.67 points. Based on this categorization, the scale key is as follows:

- Low Influence: 18.00–25.66
- Moderate Influence: 25.67–33.33
- High Influence: 33.34–41.00

By comparing the sample mean (29.1) to the defined scale, it is evident that the level of influence of educational platforms on students in the sciences and technologies of physical and athletic activities is classified as moderate.

The results of this hypothesis indicated that educational platforms moderately affected students' physical and sports activities, science, and technology. The mean effect was 29.1, and the standard deviation was 5.09.

Consequently, the findings suggest a moderate level of impact, which does not align with the original hypothesis proposing a high impact. Therefore, the first hypothesis is statistically unsupported based on the data obtained from the studied sample.

The moderate level of impact observed can be explained by the fact that not all students possess the qualifications or the capability to manage educational

platforms, thus influencing their overall experience effectively. This interpretation aligns with findings by (Begantsova et al., 2020) which examined digitalization in higher education and students' readiness to utilize digital resources. Similarly, certain studies have confirmed that most students demonstrate an intermediate level of digital competence (Grynyov et al., 2024)

In addition, the nature of the Physical and Sports Education Sciences specialization, which heavily relies on motor and skill-based activities, poses significant challenges for teaching such activities through educational platforms. The virtual learning environment has limited opportunities for both practical and experiential learning, which may negatively affect students' professional preparation and competency development. (Badau et al., 2021)

Moreover, the effective development of motor skills among students is closely associated with direct interpersonal interaction and access to physical activities, which are significantly diminished in online learning environments. (Kostova, 2022), This study underscores that students do not exhibit a positive attitude toward learning practical courses online (Savaş & Turan, 2023). Furthermore, psychological factors and acceptance of this novel form of e-learning play a crucial role in shaping students' attitudes toward educational platforms, a study by (Roman & Plopeanu, 2021) during the COVID-19 pandemic indicated that psychological stress and associated anxieties had a direct negative impact on the effectiveness of e-learning.

The findings of this study contrast with those of research suggesting that e-learning contributes to the enhancement of various student competencies. For instance, the results of studies by (Fernández-Vázquez et al., 2024; Gede et al., 2024) indicate that virtual reality is a highly effective tool for enhancing the learning of various sports activities,

Moreover, students demonstrate a positive attitude toward digitalizing education (Putilovskaya & Kassymova, 2021). Research demonstrates that educational platforms like Moodle, when combined with interactive digital strategies like immediate feedback, significantly boost student motivation for learning.

3.2 Presentation and Discussion of the First Hypothesis Results:

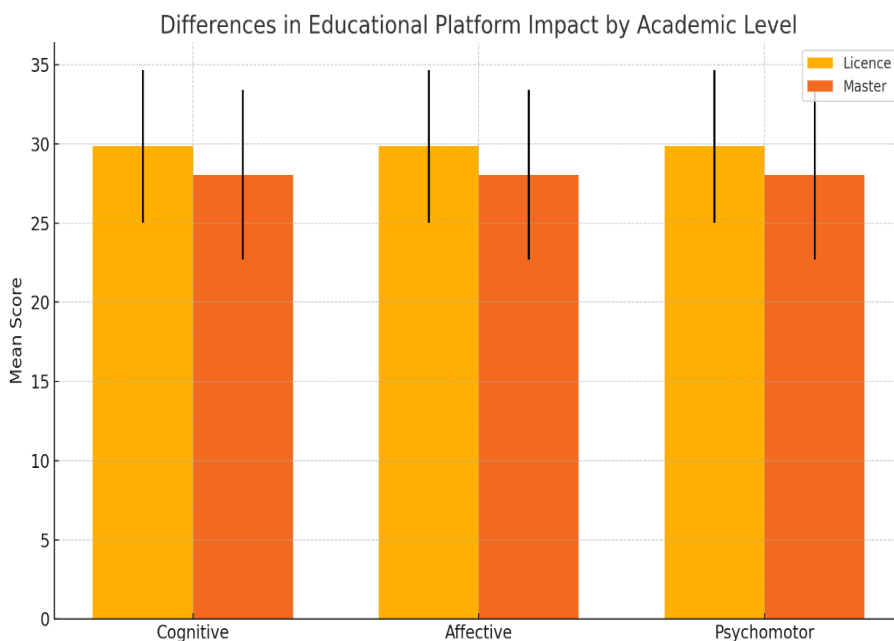
There are differences in the impact of educational platforms on the

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educational process among students of the Sciences and Technologies of Physical and Sports Activities attributed to the variable of academic level.

Table (4) presents the differences in the impact of educational platforms on the educational process among STAPS students according to their academic level.

Dimension	Academic Level	Sample Size	Mean	Std. Deviation	T-test Value	df	Significance
Cognitive Dimension	Bachelor's	15	29.85	4.83	0.943	27	0.354
	Master's	15	28.06	5.35			
Affective Dimension	Bachelor's	15	29.85	4.83	0.943	27	0.354
	Master's	15	28.06	5.35			
Psychomotor Dimension	Bachelor's	15	29.85	4.83	0.943	27	0.354
	Master's	15	28.06	5.35			



The mean scores for Bachelor's students in the cognitive, affective, and psychomotor dimensions were 29.85, with a standard deviation of 4.83. In comparison, Master's students had a mean score of 28.06, with a standard deviation of 5.35. The calculated T value was 0.943 at a degree of freedom of 27, with a

significance level of 0.354, which is not statistically significant ($p > 0.05$). Therefore, there are no statistically significant differences between Bachelor's and Master's students across the three dimensions (cognitive, affective, and psychomotor).

These results suggest that the impact of educational platforms in supporting the educational process across its various dimensions does not differ according to students' academic level. This may be attributed to the accelerated digital transformation adopted by Algerian universities, particularly in the aftermath of the COVID-19 pandemic. As a result, there has been a convergence in the level of digital competence among students at different academic levels, driven by the widespread use of technological tools by learners (Roman & Plopeanu, 2021).

The widespread diffusion of digital technologies has reduced the impact of individual differences among students, particularly in terms of their ability to use educational platforms. It is also important to highlight that the user-friendliness of these platforms has strengthened the positive correlation between digital learning environments and students' academic performance. Most students reported that e-learning improved their grades, while only a few indicated a negative impact (Fan et al., 2024).

This, in turn, increased student motivation to engage with digital platforms in the learning process. In the same context, (Kustandi et al., 2020) emphasize that students significantly improved their motivation when using virtual reality technologies, owing to a more interactive and immersive learning experience. The greater the level of interactivity, the more students perceived it as contributing positively to their academic performance. (Mehrvarz et al., 2021)

In addition, using a single, unified educational platform among students—namely Moodle—has contributed to narrowing the gap in students' ability to navigate and utilize the platform effectively. Standardized platforms help reduce the learning curve for users, as they offer a consistent interface and functionality across various disciplines. A study (Duangjai & Rutaikarn, 2020) observed that using Moodle enhanced students' motivation to learn both inside and outside the classroom, reinforcing the overall effectiveness of e-learning.

The findings of this study differ from those of (Rodafinos et al., 2024), who reported that postgraduate students demonstrated higher levels of digital competence, technology use, and academic performance. This discrepancy may be attributed to differences in academic disciplines, the instructional models adopted, or the technological infrastructure available within the respective learning environments.



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4. CONCLUSION:

This study aimed to examine the impact of educational platforms on the learning process among students majoring in the sciences and technologies of physical and sports activities at the University of Sétif 2 in light of certain variables. The results revealed that these platforms' overall level of impact was moderate, particularly when considering the cognitive, affective, and psychomotor dimensions. Such an outcome suggests a partial alignment with pedagogical objectives, especially within a discipline characterized by its practical and skill-based nature.

The first key finding indicates that while digital platforms—such as Moodle—have contributed to ensuring the continuity of learning and providing interactive educational formats, they remain insufficient in fully supporting the acquisition of psychomotor competencies. The second finding showed no statistically significant differences between Bachelor's and Master's students regarding the impact of educational platforms, which suggests a relative homogeneity in digital competence across academic levels.

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