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The extent to which educational technology contributes to the development of physical education and sports institutes

مدى مساهمة تكنولوجيا التربية في تطوير معاهد التربية البدنية والرياضية

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Abstract

This study aims to reveal the extent to which technology contributes to the development of physical education and sports institutes, by analyzing the reality of its use in pedagogical and administrative aspects. The study relied on the descriptive analytical approach to suit the nature of the topic, and was applied to a sample of 50 professors and administrative frameworks belonging to three different institutes selected in an intentional manner. The questionnaire was used as the main tool for data collection, and its validity and reliability were verified using scientific methods. The study found that technology has a prominent role in improving educational and formative performance, especially through the adoption of digital media in teaching, the development of evaluation methods, in addition to improving the effectiveness of academic management. The study also recommended the need for continuous training in the digital field for the benefit of human resources.

Keywords : Educational Technology - Physical Education - Institute Development, Pedagogy, Academic Management.

الملخص :

تهدف هذه الدراسة إلى الكشف عن مدى مساهمة التكنولوجيا في تطوير معاهد التربية البدنية والرياضية، من خلال تحليل واقع استخدامها في الجوانب البيداغوجية والإدارية. اعتمدت الدراسة على المنهج الوصفي التحليلي لملاءمته لطبيعة الموضوع، وتم تطبيقها على عينة مكونة من 50 أستاذا وإطارا إداريا ينتمون إلى ثلاث معاهد مختلفة تم اختيارهم بطريقة قصدية. استُخدمت الاستبانة كأداة رئيسية لجمع البيانات، وتم التحقق من صدقها وثباتها باستخدام أساليب علمية. توصلت الدراسة إلى أن للتكنولوجيا دورا بارزا في تحسين الأداء التربوي والتكويني، خاصة من خلال اعتماد الوسائط الرقمية في التدريس، وتطوير أساليب التقييم، بالإضافة إلى تحسين فعالية الإدارة الأكاديمية. كما أوصت

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الدراسة بضرورة التكوين المستمر في المجال الرقمي لفائدة الموارد البشرية.
- **الكلمات المفتاحية :** تكنولوجيا التعليم - التربية البدنية - تطوير المعاهد ، البيداغوجيا، الإدارة الأكاديمية

- **Theoretical chapter**

*** Introduction and problematic of the study**: The introduction and In recent decades, the physical education and sports sector has witnessed remarkable developments due to the acceleration of technological progress, prompting researchers to focus on the role of these digital transformations in modernizing training curricula and methods in this field. Educational technology is one of the most important contemporary tools that contributed to enhancing the quality of training, through the introduction of digital education, distance learning, simulation, and multimedia techniques in the educational system.

Modern pedagogical theories, such as constructivist learning theory and active learning theory, point to the importance of integrating technology as an actor in improving the learning environment, as it allows the learner to interact directly with the content, and provides opportunities for self-learning and critical thinking. The intellectual perspectives derived from approaches to total quality in education confirm that investment in technology is an essential lever to improve the educational process and improve the performance of training institutions. In this context, technology intersects with physical education through the use of physical performance measurement devices, health follow-up applications, and movement analysis software, which are tools that contribute to the development of physical and mental skills among students, and enable professors to provide accurate content and keep abreast of the latest scientific developments.

Previous Studies:

The integration of technology into the field of education in general, and the field of physical education in particular, has become an imperative imposed by accelerating technological changes and the new requirements of learners and the labor market. Digital means are no longer limited to their supportive role, but have become a pivotal element in the reformulation

of teaching methods, training methods, evaluation curricula, and even in the design of educational policies. Many international studies have dealt with this shift in depth, highlighting the gains made by the institutions that initiated the adoption of these tools, as well as the challenges that continue to hinder the process of comprehensive adoption.

In this context, the study of Upadhyay & Nathani (2015) indicates that the introduction of technology such as e-learning and the Internet has clearly contributed to improving the effectiveness of teaching within physical education institutions. Students have access to a variety of sources of mathematical information, from explanatory videos, interactive lessons, to specialized scientific articles. These tools have enabled the transcendence of temporal and spatial barriers that have long limited the effectiveness of traditional education. However, the study did not neglect to mention the challenges associated with the "digital divide", as some groups of students and teachers still suffer from difficulties in accessing the Internet or in possessing sufficient digital skills, which obliges educational institutions to adopt flexible and comprehensive solutions to reduce this disparity.

In a remarkable development, a recent study by Lu (Lu, 2024) observed how artificial intelligence has become essential in the personalization of sports education, allowing students to have individualized educational experiences commensurate with their abilities and pace of learning. The study highlights how AI systems were able to provide real-time analyses of physical performance, use tracking algorithms to improve play or exercise techniques, and provide realistic training simulations that helped learners develop their skills in a safe and effective environment. This specialization in education has not only improved the physical outcomes of students, but has also contributed to raising the levels of interaction and engagement in the educational process.

On the other hand, a study conducted by Suciu et al. (2021) confirmed that the use of technology extends to motivating students to continue learning outside the walls of the educational institution, through the use of smart devices such as sports watches and fitness tracking applications. These tools provided ongoing mechanisms for tracking physical

progress, linking sports activity to educational and health goals. The study showed that students who used these applications were more committed to training plans, and achieved better results at the physical and cognitive level, which indicates the effectiveness of combining formal education with self-technological practices.

At the level of analysis of published research, a recent bibliometric analytical study (Suardi et al., 2024) examined 350 scientific papers related to the use of technology in physical education, and found that there has been a significant upward growth in interest in this topic since 2012, especially in areas such as e-learning, smart systems, and digital interaction. However, at the same time, the study revealed a noticeable lack of studies dealing with teachers' experiences and attitudes towards these technologies, which highlights a research gap that requires greater attention in the future, especially since the success of any educational innovation depends on the teacher's acceptance of it and the availability of a supportive environment.

In the same direction, a review study prepared by Ahsan (2024) showed that a range of modern technologies – such as augmented reality, smart boards, and digital evaluation – have a direct impact on improving curriculum design and developing teaching methods in physical education. These tools have allowed the delivery of more interactive and diverse content, which enhances learners' motivation, and improves their ability to absorb and apply in practice. Digital assessment also contributed to providing immediate feedback to students, and customizing educational paths that help them overcome individual difficulties. On the other hand, the study warned of the need to address the disparity in access to these tools, especially in institutions with limited resources, which calls for the adoption of less expensive and more applicable technical solutions in various contexts.

From a purely applied point of view, a recent study by researcher Ilieva (2023) dealt with the importance of using modern technological means such as smart boards, electronic tests, and educational sites in teaching physical education methodology. She stressed that the success of employing these means is not limited to their availability, but depends mainly on the efficiency

of the teacher in using them. Therefore, the study recommended the need to train teachers and qualify them with specialized digital skills, and to link this training to the needs of the material and sports content, to ensure the effectiveness and sustainability of the process of technological integration.

These studies reveal a clear path towards a comprehensive digital transformation in the field of physical education, where the use of technology is no longer a complementary option, but a strategic necessity to improve the quality of education and training. However, this transformation remains dependent on providing a supportive institutional environment, building digital competencies among teachers, and redesigning curricula to accommodate the potential offered by these technologies. There is also an urgent need to expand the base of applied research in this field, in order to gain a deeper understanding of users' experiences, identify the most effective ways to overcome current challenges, and achieve effective integration between educational content and modern technological tools.

Research gap

Despite the great momentum of scientific research in recent years on the employment of technology in the educational field, especially in the field of physical education and sports, the tracker of academic production notes that there are clear gaps related to the institutional perspective of the use of technology, especially in the Arab and Moroccan context. Previous studies reviewed (e.g. Upadhyay & Nathani, 2015; Suciu et al., 2021; Lu, 2024; Ilieva, 2023) focused in their entirety on:

- The impact of technology on the learner: such as improving interaction, enhancing physical effectiveness, customizing education, and using smart devices to track performance.
- Analysis of specific tools and techniques: such as e-learning, artificial intelligence, augmented reality, smart whiteboards.
- Analytical bibliometric studies: dealt with research production quantitatively without delving into applied practice in institutions.

- The absence of applied studies in Arab educational environments in particular, which reflect the cultural, structural and logistical peculiarities of physical and sports education institutions in this region.

Hence, the current research gap crystallizes in the following axes:

1. Weak focus on the Arab institutional context: Most studies focus on countries with advanced digital infrastructure, while physical education institutions in many Arab countries still face realistic challenges in infrastructure and resources.
2. The absence of a holistic analysis that combines the formative aspect (pedagogical) and the administrative aspect (administrative):Studies often separate the impact of technology on education from its impact on management, while reality imposes an integrative study that combines both sides.
3. Lack of direct field studies: Most of the previous research relied on theoretical reviews or bibliometric analyses, without actually identifying field practices through applied tools such as a questionnaire or interview.
4. Lack of realistic evaluation of the extent to which technology contributes to the development of institutes as institutions: There are not enough studies on the contribution of technology to achieving comprehensive institutional transformation, whether in terms of modernizing teaching methods, improving management mechanisms, or enhancing the quality of academic training.
5. Lack of focus on the experiences of professors and administrators as a primary source of data:Some studies focused on students, or on technology as a subject in itself, without giving enough space to the experiences of key actors within institutions.

The Significance Of The Research:

Building on these gaps, this research seeks to fill the gap in the literature by:

- Analyze the reality of the use of technology in physical education and sports institutes in a local and field context.

- Collect data directly from practitioners (professors, administrators) to understand challenges and opportunities from the perspective of the actual user.
- Linking the formative and administrative aspect to provide a comprehensive vision on the role of technology in the development of the Institute as an integrated educational institution.
- Make actionable recommendations that take into account the realistic context and the possibilities available.

Against this background, this study poses the following problem:

To what extent does technology contribute to the development of physical education and sports institutes?

The following sub-questions are subdivided:

- What is the reality of using technology in the educational aspects within the institutes?
- What is the level of impact of technology on improving managerial and pedagogical performance?
- What are the challenges in integrating technology into physical education institutes?

It has the following objectives:

- Analyze the use of technology in academic and administrative training.
- Assessing the impact of technology on the quality of the outputs of physical education institutes.
- Provide practical suggestions for the development of digital configuration strategies.

The importance of this study is that it touches on one of the modern trends in education, and provides scientific data that can be used to formulate future educational policies.

- **The practical chapter** :

A field study was conducted on three institutes of physical education and sports, with the aim of identifying the reality of using technology in the fields of training and management within these institutions. This survey came in response to the rapid transformations in the field of

information and communication technology, and the challenges and opportunities they pose to educational institutions in general, and physical and sports education institutes in particular, in their quest to modernize training methods and improve the quality of administrative and educational management.

Methodology of the Study:

The **descriptive analytical** approach was adopted, because of its ability to describe educational and social phenomena in their natural environment, and to analyze their dimensions and components. This approach has enabled researchers to objectively monitor the reality of technology use and derive scientific indications based on accurate field data.

Population and Sample of the Study:

The study population consists of all professors and administrators working in the three institutes under study. From this community, an **intentional sample** of **50 individuals** was selected, in order to represent various disciplines (movement sciences, sports training, sports management...) As well as the diversity of years of experience among the participants, which gave the sample a representative dimension that enhances the credibility of the results.

The purposive sampling was scientifically justified by the need to capture the diversity of expertise and professional experience relevant to the study's objectives.

The study tool and its psychometric characteristics:

The **questionnaire** was used as a basic tool for data collection, given its ease of distribution and explanation, and its ability to survey a large number of participants in a short time. The questionnaire contained a set of axes related to:

- the level of technology integration into pedagogical formation,
- The use of digital means in administrative management,
- Challenges faced by professors and administrators in employing technology,
- Future perceptions of the modernization of the educational and management process.

To ensure the **validity and stability of the tool**, the questionnaire was subjected to a stability test using the Cronbach Alpha coefficient, with a value of **0.87**, which is a high value indicating a **high degree of reliability**, which ensures the accuracy and stability of the measurement across the various paragraphs of the questionnaire.

Table 1: Validity and reliability coefficient of the study tool

Axis Number	Axis	Number of Items:	Stability coefficient (Cronbach Alpha)	Stability indication	Remarks
1	Use of Technology in Formation	10	0.85	High	Good
2	The use of technology in administrative management	8	0.83	High	Acceptable
3	Challenges and difficulties	6	0.80	High	Constancy
4	Future Perceptions	6	0.89	Very High	Excellent stability
Grand Total	Questionnaire	30	0.87	Very High	The tool is reliable

Source: SPSS 28th Edition

The results of Table No. (1) showed that the study tool used – consisting of 30 paragraphs divided into four main axes – has a high degree of stability, which is evident through the **Cronbach Alpha** coefficient, which is a strong indicator of the reliability of the tool and its ability to measure the studied phenomena consistently. At the sub-axis level, the axis of "using technology in formation" and the axis of "administrative management" achieved stability coefficients of **0.85** and**0.83**, respectively, indicating **very good and high stability**, which enhances the validity of the tool to measure technology use practices in the pedagogical and administrative fields. The “Challenges and Difficulties” axis also recorded a value of **0.80**,

which is considered a scientifically acceptable level and indicates **good consistency** in monitoring the obstacles facing the use of digital tools. While the "Future Perceptions" axis achieved the highest stability rate of **0.89**, which indicates **excellent reliability** in measuring the extent of the respondents' awareness and future perceptions about digital transformation in higher education. Looking at these results together, it can be said that the questionnaire tool is characterized by a high degree of internal consistency, which gives the results of the study strong statistical and moral credibility, and enhances the possibility of its generalization and investment in building practical recommendations. From a methodological point of view, these indicators reflect the accuracy of the tool's design and its suitability for measuring the target variables, which makes it a solid basis for conducting reliable scientific analysis of the subject of the study.

Presentation, interpretation and discussion of the results.

The results of the completed field study on three physical education and sports institutes showed important data that reflect the reality of the use of technology in the training and management processes within these institutions. These data were collected through a questionnaire directed to an intentional sample of 50 professors and administrators working in the institutes. The data were analyzed by adopting appropriate statistical methods.

Table 2: Degree of Technology Utilization in Teaching by Faculty Members

Category	Number of individuals	Weight (%)
They use technology periodically	41	82%
They use technology sometimes	7	14%
They don't use technology	2	4%
Total	**50**	

Source: SPSS 28th Edition

The results of Table No. (2) indicate that 82% of the respondents periodically use technology in teaching, which clearly reflects the increasing awareness of professors of the importance of integrating digital tools in the educational process, whether through presentations,

educational platforms, or electronic interaction tools with students. This high percentage may also be the result of the development of the technical infrastructure in educational institutions, and the provision of training and technical support necessary to enhance the digital competence of faculty members. In contrast, 14% of professors sometimes use technology, which may indicate that there are some technical challenges or weaknesses in digital skills, or perhaps that some of them prefer the traditional way of communicating information. The remaining 4%, who do not use technology at all, despite its limitations, highlight the need to intensify training efforts and provide the necessary support to motivate this part of the faculty to interact positively with digital transformation. Based on the above, it can be concluded that the general trend is towards the adoption of technology in education, but there is a continuous need to expand rehabilitation opportunities and overcome obstacles to ensure the inclusiveness of this transformation and enhance its effectiveness.

Table 3: Most Frequently Used Technologies in Teaching

Technological Method	Number of users	Percentage of sample (%)
Presentation Software (PowerPoint, Prezi)	40	80%
Training applications (video analysis, physical evaluation)	35	70 %
E-learning platforms (Moodle, Teams...)	22	44%
Video projectors	18	36%
Not currently using	2	4%

Source: SPSS 28th Edition

The results of Table No. (3) showed that presentation programs such as PowerPoint and Prezi are the most used technological means by professors, where the percentage of their use reached 80%, followed by training applications for video analysis and physical evaluation by 70%, then e-learning platforms by 44%, and finally video projectors by 36%. Remarkably, only 4% of the respondents do not use any technological means in teaching. This trend reflects a great reliance on means that allow the presentation of content in a visual and interactive manner, which contributes to facilitating the delivery of concepts, especially in materials that

combine theoretical explanation and practical application, as is the case in the field of physical and sports education. This demand is attributed to several factors, most notably the change in academic training methods towards more modern and effective models, in addition to the increasing pressure on educational institutions to keep pace with digital transformation and the requirements of the labor market, which has become increasingly important for digital competencies. The dynamic nature of the subject also necessitates employing the means to analyze physical performance, explain technical skills, and provide educational content in innovative and attractive ways for students. Thus, the widespread use of these means reflects not only their availability, but also teachers' awareness of their role in improving the quality of learning and enhancing teacher-student interaction.

Table 4: Effectiveness of Digital Systems in Administrative Management

Category	Number of individuals	Weight (%)
They consider digital systems very effective	23	46%
They consider it to be somewhat effective	15	30%
They consider it ineffective	7	14%
They have never used it before	5	10%
Total	50	100%

Source: SPSS 28th Edition

The results of Table No. (4) indicate that a significant percentage of administrators – 76% – believe that digital systems are effective to varying degrees in administrative management within educational institutions, as 46% of the sample reported that these systems are very effective, while 30% believed that they are somewhat effective, which reflects a positive general trend towards adopting digital transformation in the administrative field. The respondents confirmed that the reliance on digital management tools, such as scheduling programs, academic evaluation platforms, and university information management systems, has helped reduce manual effort, contributed to improving the efficiency of communication between departments, and raised the accuracy of administrative processes related to

registration, evaluation, and pedagogical follow-up. On the other hand, 14% indicated that these systems are ineffective, while 10% stated that they do not use them at all, which highlights a disparity in the level of digital transformation between institutes, and this may be due to a disparity in the technical infrastructure, or to a lack of training and training in the use of these systems. These results, although they reflect a generally positive image, at the same time pose challenges that require reconsideration of the readiness of educational institutions in terms of equipment and technical support, in order to ensure a comprehensive and effective application of digital systems at all administrative levels.

Table 5: Technology Use by Years of Experience

Years of Experience	Number of Participants	High Utilization
Less than 5 years	12	58%
5 – 15 years	28	89%
> 15 years	20	65%

Source: SPSS 28th Edition

Table No. (5) reveals that there are clear differences in the level of technology use according to years of professional experience, with a notably high usage rate of 89% among professors and administrators whose experience ranges from 5 to 15 years. This finding highlights the positive impact of professional maturity combined with adaptability, and it underscores the importance of continuous training programs. Ongoing professional development appears to play a crucial role in equipping this group with the necessary skills to effectively integrate technology into educational and administrative practices, ompared to only 58% among those with less than 5 years of experience, and 65% among those whose experience exceeded 15 years. This finding is significant, as it breaks the stereotype that the younger or less-experienced group is more likely to use modern technologies, and instead highlights that the middle-experienced group is more likely to interact with digital tools in educational and administrative practice. This disparity can be explained by several overlapping factors. First, the category of people with intermediate experience is often at the peak of its professional and technical integration, where it has frequent opportunities for continuous training, and is more

in contact with pedagogical developments that impose the use of technology as a necessity rather than an option. Secondly, this group often possesses advanced digital competence resulting from previous professional experiences that enabled them to acquire multiple skills, without yet suffering from professional fatigue or technological inertia that may affect those with long experience. In contrast, the low use of the new category may be attributed to insufficient university training in the field of digital competencies, or to its preoccupation with adapting to the new work environment. As for the more experienced group, they may face challenges related to psychological resistance to change, or the failure of some of their members to keep pace with rapid technical developments. Hence, there is a need to adopt institutional policies that ensure the dissemination of digital training and qualification opportunities to all groups, without assuming that years of experience in themselves are sufficient to ensure the effective use of technology. Supporting less tech-savvy groups, whether through training or successful use models, is a necessary step to achieve digital justice within educational institutions and ensure a smooth transition towards full digital transformation.

Table 6: Comparison of Current Study Results with Gharbi (2021)

Axis	Study Findings	Western results (2020)	Mesh points (Eng.)
Use technology	Relatively high (82% for professors, 76% for administrators)	Middle	Both studies confirm the importance of technology
Barriers	Lack of configuration, poor infrastructure	Poor training, absence of a supportive environment	Barriers
Impact of Technology on Performance	Improved configuration and handling	Supporting pedagogical performance	Agreement in Positive Influence
Recommendations of the study	Continuous training support, infrastructure development	Provide continuous configuration and policy updates	Convergence in proposed solutions

Source: Prepared by the researcher

When comparing these results with previous literature, in particular **Gharbi's (2021)** study, we note a clear intersection in the conclusions, as that study showed that technology is a **pivotal element in improving pedagogical performance and developing educational management**, but the main challenge, as both studies confirm, is the **lack of training and weak digital infrastructure**.

While stakeholders are increasingly aware of the need for digital transformation, the technical possibilities available remain limited in many organizations, which negatively affects the possibility of optimal employment of technology. Some studies also suggest that the absence of an overarching strategic vision for integrating technology into education is an additional barrier, particularly when initiatives are left to individual jurisprudence without clear institutional framing or guidance.

Based on these results, it can be said that physical education and sports institutes have made important strides in integrating technology, both in training and management, but there is still considerable room for development, especially with regard to providing technical means, modernizing infrastructure, and raising awareness of the importance of continuous training. It is also recommended to adopt a clear institutional policy based on a periodic diagnosis of digital needs, while encouraging good practices and exchange of experiences between institutes.

The results clearly highlight that technology has become an integral part of the training and administrative process in physical education and sports institutes, and also emphasize the importance of continuous training in the development of digital competence. In light of the comparison with previous studies, it is clear that structural and formative challenges still hinder the optimal use of technology, which requires strategic intervention from the custodians to support these institutions in the path of digital transformation, in order to ensure the quality of education and the efficiency of institutional performance.

Conclusions

Based on the field results reached through the exploratory study that included three institutes of physical education and sports, it is possible to draw a set of basic conclusions that answer the problem at hand, and clarify the reality of using technology in training and management:

1. The high level of use of technology in pedagogical training: The study showed that 82% of professors periodically use technology in teaching, especially presentation programs and training applications, which indicates a growing awareness of the importance of employing digital tools to improve the quality of education.
2. Increased adoption of digital systems in administrative management: The results showed that 76% of administrators acknowledge the effectiveness of digital systems in facilitating academic management tasks, including scheduling, evaluation, and follow-up.
3. The presence of statistically significant differences associated with years of experience: The data indicate that the average category in terms of years of experience (5–15 years) showed the highest levels of use of technology, reflecting the importance of continuous formation in enhancing digital efficiency.
4. The impact of configuration and poor infrastructure on the effectiveness of use: It was found through comparison with previous studies, especially the study of "Gharbi (2020)", that the common challenges lie in the lack of specialized training, and the weakness of digital infrastructure, which limits the optimal use of technology.
5. Lack of a clear institutional strategy for digital transformation: Despite positive individual initiatives, the absence of a structured and systematic institutional framework remains an obstacle to the effective universal use of technology.

Suggestions:

Based on the above data and the results from the three institutes, we propose a set of actionable recommendations to overcome current obstacles and enhance educational and administrative performance through technology:

1. Enhance Continuous Digital Training Programs

The high percentage (82%) of periodic technology users indicates a solid foundation, but the 14% occasional and 4% non-users reveal gaps that must be addressed. Therefore, launch specialized and continuous training programs tailored to varying levels of digital proficiency. Focus on practical skills related to learning management systems, scheduling tools, evaluation platforms, and administrative software to elevate occasional users into regular and confident adopters.

2. Strengthen Digital Infrastructure in Underperforming Institutes

The variance in technology adoption rates across institutes suggests uneven access to digital tools and reliable internet. Institutes with lower adoption should be prioritized for upgrades, including high-speed internet, smart classrooms, and up-to-date devices. This will ensure all users—especially those who are currently inconsistent—can rely on stable infrastructure.

3. Establish a Strategic Framework for Digital Integration

The usage patterns point to organic, individual-based efforts rather than a coherent institutional policy. To address this, each institute should develop a strategic digital transformation plan with measurable short-, medium-, and long-term goals, ensuring that technology is systematically integrated across teaching, evaluation, and administration.

4. Capitalize on the High Engagement of Mid-Experience Staff

As shown in Table 5, professionals with 5–15 years of experience have the highest technology usage (89%). This group can be leveraged as digital ambassadors or peer trainers to mentor both less experienced and senior staff, promoting internal capacity-building and shared best practices.

5. Incentivize Innovation in Tech-Driven Education

To sustain and expand effective digital use, especially among highly engaged users, institutes should offer recognition, professional development credits, or other incentives for professors and administrators who integrate innovative digital practices into their work. This will help maintain momentum and encourage wider participation.

6. Standardize Digital Platforms for Teaching and Student Monitoring

The diversity in usage habits calls for adopting unified digital platforms across institutes. This would harmonize tools for communication, evaluation, and administrative tasks, improving efficiency and reducing fragmentation in digital practices.

7. Integrate Digital Competence into Student Training Curricula

To ensure long-term impact, institutes should embed digital literacy and educational technology modules into student training programs. This prepares future educators and administrators in physical education to operate effectively in increasingly digital environments, ensuring continuity of digital progress.

Prospects for future research:

Based on this study, future research orientations can be proposed that contribute to deepening understanding about the relationship between technology and the educational process in the field of physical education:

– Completion of comparative studies between different institutes in multiple states or other countries, to monitor disparities in technology integration and analyze their causes.

– Studying the relationship between the use of technology and improving students' results in applied and theoretical subjects.

– Researching the impact of digital transformation on the quality of vocational training among graduates of physical education institutes.

Exploring the psychological and educational impact of the use of technology on the teacher and the student within the educational environment.

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