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Requirements for Digital Transformation in Physical Education Curricula According to Quality Standards

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ABSTRACT

Educational curricula have undergone significant transformations due to rapid technological advancements, making digital transformation a central element in developing education according to modern quality standards. This study aims to analyze the digital transformation requirements in physical education curricula in line with contemporary educational quality standards. The study adopted a descriptive-analytical approach, and data were collected using a questionnaire assessing the readiness of digital curricula from a sample of 100 faculty members, The results revealed that digital infrastructure is available at an above-average level but is insufficient to fully support digital transformation. Digital content showed a clear gap between curriculum objectives and available materials, focusing primarily on theoretical aspects with limited integration of practical activities. Faculty members' digital competencies were moderately advanced, while significant challenges were identified, including insufficient devices and software, weak infrastructure, limited continuous training, and unclear standards for digital transformation. A strong positive correlation was observed between digital competencies and digital teaching practices, Based on these findings, the study recommends developing digital infrastructure, enhancing digital content, improving faculty digital competencies through continuous training programs, promoting digital teaching practices These recommendations aim to improve curriculum readiness, support interactive learning, and enhance educational outcomes in physical education.

Keywords: Digital transformation, Physical education, Educational curricula, Educational quality standards, Digital competencies, Digital teaching practices.

متطلبات التحول الرقمي في مناهج التربية البدنية وفقًا لمعايير الجودة

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المستخلص

شـهدت المناهج التعليمية تحولات كبيرة نتيجة التطورات التكنولوجية المتسـارعة، مما جعل التحول الرقمي عنصـرًا محوريًا في تطوير التعليم وفقًا لمعايير الجودة الحديثة. وتهدف هذه الدراســة إلى تحليل متطلبات التحول الرقمي في مناهج التربية البدنية بما يتوافق مع معايير الجودة التعليمية المعاصــرة. وقد اعتمدت الدراســة على المنهج الوصــفي التحليلي، وجُمعت البيانات باســتخدام اســتبانة لقياس جاهزية المناهج الرقمية، وذلك من خلال عينة مكونة من (100) عضــو من أعضاء هيئة التدريس.

وكشــفت النتائج أن البنية التحتية الرقمية متوافرة بمســتوى أعلى من المتوســط، إلا أنها غير كافية لدعم التحول الرقمي بصورة كاملة. كما أظهر المحتوى الرقمي وجود فجوة واضـحة بين أهداف المنهج والمواد المتاحة، حيث يركز بدرجة أســاســية على الجوانب النظرية مع دمج محدود للأنشـطة العملية. كما جاءت الكفايات الرقمية لدى أعضــاء هيئة التدريس بمســتوى متوســط متقدم، في حين برزت عدة تحديات مهمة، من بينها نقص الأجهزة والبرمجيات، وضــعف البنية التحتية، ومحدودية التدريب المستمر، وعدم وضوح معايير التحول الرقمي.

كما أظهرت النتائج وجود علاقة ارتباطية موجبة قوية بين الكفايات الرقمية وممارســات التدريس الرقمي. وبناءً على هذه النتائج، توصـــي الدراســة بتطوير البنية التحتية الرقمية، وتعزيز المحتوى الرقمي، وتحســين الكفايات الرقمية لأعضــاء هيئة التدريس من خلال برامج تدريبية مســتمرة، ودعم ممارســات التدريس الرقمي. وتهدف هذه التوصــيات إلى تحسين جاهزية المناهج، ودعم التعلم التفاعلي، وتعزيز مخرجات التعليم في مجال التربية البدنية.

الكلمات الدالة: التحول الرقمي، التربية البدنية، المناهج التعليمية، معايير الجودة التعليمية، الكفايات الرقمية، ممارسات التدريس الرقمي.

Introduction

The contemporary world is witnessing fundamental transformations in educational systems as a result of the rapid development of digital technologies and artificial intelligence. This has made digital transformation a central focus of international and national educational policies. Educational institutions are now required to restructure their curricula in accordance with global quality standards, which are now based on the use of digital tools, data analysis, and the promotion of interactive learning environments. UNESCO reports (UNESCO, 2023) indicate that digital transformation is a fundamental pillar in building "sustainable education" capable of meeting learners' cognitive and skill-based needs, especially in light of the enormous technological changes that have reshaped learning and teaching methods around the world. The OECD, in its report on digital education, confirms that curricula are no longer measured solely by their ability to provide content, but rather quality now depends on the level of integration of digital technologies and the clarity of conceptual frameworks that support the development of 21st-century skills such as critical thinking, innovation, and collaborative work (OECD, 2021). This transformation is essential across all disciplines, but physical education occupies a special position due to its practical nature and direct link to physical performance, making it one of the fields most in need of systematically employing technology to keep pace with global developments.

Recent international literature indicates that motion technology and digital applications for motion analysis have contributed to improving the quality of motor education by enhancing assessment methods, strengthening feedback mechanisms, and increasing teachers' ability to track learners' skill development. Bailey and Kirk (2020) note that physical education is increasingly reliant on digital systems capable of providing accurate measurements of motor skills, thus improving teaching efficiency and contributing to the development of data-driven learning strategies. The digital component has been further enhanced through the use of presentations, shared portfolios, and live online instruction by trainers from the United Kingdom. Abushafa, M., Albeshti, M., & Mandra, F. (2020). In the United Kingdom, teacher training qualifications have also been developed that focus on adult education or education for those over 14 years of age. These qualifications are divided into three levels: Level 1: the Award in Education and Training (AET), which offers modern methodologies and a general structure for teaching; Level 2: the Certificate in Education and Training (CET), which targets trainers in professional institutions and focuses on planning educational programs and developing teaching and assessment skills; and Level 3: the Diploma in Education and Training (DET), which leads to the status of a qualified teacher and includes theoretical and practical applications and conducting educational research (Abushafa, M. 2014). Furthermore, the WHO (2022) confirms that wearable technologies are no longer just sports equipment but have transformed into educational tools that help track physical activity, analyze steps, and assess fitness objectively using temporal and digital data. In the Arab context, Al-Sultan (2021) indicates that digital transformation now includes rebuilding the philosophy of the curriculum itself, starting with the formulation of objectives. This includes everything from digital technology to evidence-based content design and the development of smart data-driven assessment tools. Al-Yousef and Al-Salmi (2022) argue that implementing digital educational quality standards requires a robust technological infrastructure, professional teacher training, and accredited frameworks for evaluating digital practices within curricula. They point out that many Arab curricula still need precise calibration to ensure their alignment with digital quality standards. In the field of physical education, several Arab studies have shown that integrating technology into teaching contributes to enhancing student learning and increasing their motivation towards physical activity. Hassan and Abdulaziz (2021) explain that wearable technologies and cloud computing applications are effective tools in teaching motor skills, as

they provide real-time data that helps teachers improve their lesson plans. Al-Omari (2023) points out that digital transformation is essential for developing physical education curricula, especially with the emergence of blended learning environments, augmented reality, and e-assessment. These elements have become part of the quality standards adopted in many educational systems. The importance of international quality standards such as ISTE (2021) and AECT (2019) is also highlighted. These standards offer constructive models for modern digital curricula and emphasize that technology should be a functional component of the curriculum, not merely an added tool. These standards include: clear digital identity for the content; setting digitally measurable learning objectives; adopting interactive, data-driven teaching strategies; and developing intelligent assessment tools capable of analyzing student performance. These requirements are pivotal when analyzing curricula, especially those combining practical and applied aspects, such as physical education curricula. Based on the above, it can be said that analyzing the requirements for digital transformation in physical education curricula, according to modern educational quality standards, is a fundamental scientific step towards building curricula that keep pace with the digital age, are capable of activating technology-enhanced learning, provide more accurate educational experiences, and raise the efficiency of both teachers and learners. This analysis also contributes to revealing the gaps between the current situation and aspirations, determining the readiness of curricula for transformation, and providing a scientific basis for developing visions that align with global educational trends.

Research Problem

Despite the accelerating international trend towards digital transformation in education, as emphasized by reports from international organizations such as UNESCO and the OECD, the reality of physical education curricula still faces a clear gap between what should be and what actually exists. Current curricula are often designed according to a traditional model that focuses on direct motor exercises without fully utilizing the potential offered by modern digital technologies, such as motion analysis systems, augmented reality, wearable applications, and interactive learning platforms. Furthermore, these curricula do not adequately reflect the requirements of digital educational quality, which emphasizes the integration of technology, content, and assessment tools. Recent educational research indicates a deficiency in the digital infrastructure of many educational institutions, inadequate teacher training in the use of technology in teaching, and a lack of clear standards for determining the levels of technology integration in physical education curricula. This deficiency leads to a gap between the educational goals that call for the activation of digital education and the practical reality, which still relies in many aspects on traditional methods that do not benefit from the analytical and interactive capabilities of modern technology. There is also a lack of clarity regarding the normative framework that curricula should be based on in their transition to the digital environment, whether in terms of content design, teaching methods, assessment techniques, or the management of learning experiences. This deficiency is further complicated by the practical nature of physical education, which requires specialized digital tools and multimedia learning environments capable of analyzing motor performance and providing real-time feedback. However, many current programs still lack the integration of technologies that have become an essential part of global educational practices, thus limiting students' ability to acquire physical and cognitive skills that meet modern quality standards. The absence of clear indicators for measuring digital transformation in physical education curricula makes development processes unsystematic and affects the quality of implementation and the alignment of educational outputs with the requirements of the digital age. Given the nature of the researchers' work as faculty members, they noticed a gap between modern educational trends that call for digital

transformation based on quality standards, and the actual reality of physical education curricula, which still suffers from a deficiency in integrating and employing technology efficiently.

The Importance of the Research

The importance of this study lies in its focus on a topic considered a contemporary global trend in educational development: the digital transformation of physical education curricula. This field still requires clear scientific theorizing and rigorous methodological grounding. The study's primary significance stems from its attempt to construct a comprehensive knowledge framework that clarifies the requirements for digital transformation in physical education curricula according to modern educational quality standards. It contributes to bridging a clear scientific gap in Arabic literature, which has rarely addressed this field systematically, integrating the dimensions of technology, content, and motor skills. This study represents a scientific reference framework that can be relied upon in curriculum development and modernization processes to align with digital advancements. The study's importance is further highlighted by its practical application, as it provides accurate and reliable data on the extent to which the requirements for digital transformation are met in the current educational landscape. This equips educators with scientific evidence to help them take practical steps to improve curriculum structure and enhance its digital readiness, whether through developing technological infrastructure, redesigning content, or supporting e-learning strategies.

The study's significance is also evident in its practical application, as it provides accurate and reliable data on the availability of digital transformation requirements in the current educational reality. This places educators in the hands of scientific evidence that assists them in taking practical steps to improve curriculum structure and enhance its digital readiness, whether through developing technological equipment, redesigning content, or supporting e-learning strategies. The study is also distinguished by its enhancement of physical education teachers' capabilities through a clear vision of the technological practices that can be employed within practical and theoretical lessons. Physical education requires specialized digital tools for motion analysis, real-time feedback, and digital simulation. This makes the study's findings an important tool for guiding teachers' professional development and retraining programs to keep pace with modern digital needs, the study's significance extends beyond curriculum development to include improving the quality of educational outcomes in physical education. Digital transformation contributes to enhancing the accuracy of motor assessments, increasing student engagement, and providing personalized learning opportunities based on real student performance data, thus strengthening modern educational practices.

Research Objective: To identify the digital transformation requirements necessary for developing physical education curricula in accordance with comprehensive quality standards, thereby contributing to improving the efficiency of the educational process and enhancing student learning outcomes.

Research Question: What digital transformation requirements should be met in physical education curricula to achieve quality standards in the educational process?

Research Areas

This research focuses on three main areas representing the fundamental dimensions of the digital transformation requirements in physical education curricula:

First Area: The Technical Area : This area focuses on studying the availability of a supportive technological environment for digital transformation in physical education curricula. It includes:

1- Availability of appropriate digital devices and technologies for physical education (such as tablets and motion analysis software).

2- Readiness of digital infrastructure in schools (internet networks, digital learning platforms, and data security).

3- Availability of digital educational materials related to movement content.

4- The degree of integration of technological tools with theoretical and practical physical education lessons.

Second Area: The Curriculum and Educational Content Area

This area focuses on studying the readiness of physical education curricula for digital transformation in terms of design, content, and quality standards. It includes:

1- The degree to which digital skills and technological awareness are incorporated into the curriculum's objectives and components.

2- The quality of digital content and its suitability to the nature of physical activities.

3- The alignment of curricula with modern educational quality standards, digital accreditations, and competencies. 4- The extent to which the curriculum supports data-driven learning and digital assessments of physical performance.

Third Area: Human Resources, represented by faculty members.

This area focuses on the role of teachers and supervisors in implementing digital transformation, and includes:

1- The level of teachers' proficiency in utilizing digital technologies in physical education instruction.

2- Teachers' attitudes towards digital transformation and educational innovation.

3- The level of specialized professional training in digital physical education.

4- The degree of use of modern teaching methods that rely on digital analysis, augmented reality, motion tracking, and artificial intelligence.

Research Terms

Digital Transformation: Digital transformation refers to the process of employing modern technology to reshape educational practices and enhance the efficiency and quality of learning environments by integrating digital tools and platforms into content, assessment tools, and teaching methods (Al-Sultan, 2021). Al-Omari (2023) views digital transformation as a shift towards flexible and intelligent learning models that are data-driven and support interaction and personalization.

Physical Education Curricula: Physical education curricula are defined as a set of structured educational experiences aimed at developing learners' physical, motor, cognitive, and social abilities through educational sports activities planned according to educational and professional principles (Al-Khalifi, 2022).

Modern Educational Quality Standards: These are a set of indicators and standards that aim to improve educational outcomes. They include content quality, teaching efficiency, assessment, digital infrastructure, and the integration of technology in education (Al-Yousef & Al-Salmi, 2022). Recent studies indicate that achieving digital quality requires aligning

curricula with international standards such as digital accreditation, technical competencies, and the feasibility of electronic assessment (Al-Hussein, 2020).

Related Studies

1- Study: Ali, Wasan Hussein, 2025

Titled "Digital Transformation and its Role in Achieving Institutional Excellence in Colleges of Physical Education and Sports Sciences in Iraq," this study aims to reveal the level of adoption of digital transformation in colleges of physical education and to determine its impact on supporting institutional excellence indicators. The study hypothesized a statistically significant relationship between the level of digital transformation and institutional excellence indicators, as well as significant differences in the level of digital transformation according to functional variables. The study was conducted on a purposive sample of (87) faculty members in colleges of physical education at some Iraqi universities. The most important findings were: the availability of moderate levels of digital infrastructure, with a clear deficiency in specialized educational applications; and that digital transformation statistically contributes to raising the level of institutional excellence, but to a limited extent due to weak training, lack of administrative support, and the need for institutional strategies for computing and developing digital competencies.

2- Study: Al-Awawdeh, Muhammad Mahmoud, 2023

Titled "The Extent of E-Learning Use by Physical Education Teachers in Jordanian Public Schools"

This study aimed to identify the degree of e-learning use in physical education classes and to uncover obstacles to digital integration in daily practice. The study was conducted on a sample of (120) male and female physical education teachers from various educational directorates. The results showed that the actual use of e-learning in physical education is low to moderate. The most prominent obstacles were: weak infrastructure, lack of training, insufficient time, and unclear digital policies in sports education. Significant differences were found in favor of teachers with higher digital experience.

3- Study: Jassim, Abdul Rahman Muhammad, 2023

Titled "The Effectiveness of Using Smart Applications in Improving Students' Skills in Physical Education"

This study aimed to examine the effectiveness of smartphone applications and digital media in developing students' motor and cognitive skills, as well as to compare student results between the traditional method and the application-enhanced method. The study was conducted on a sample of (60) middle school students, divided into two groups (experimental/control). The most important results showed that the experimental group outperformed the students in fine motor skills and cognitive achievement, and that there was a clear increase in motivation among the students who used the applications.

4- Study: Al-Harthi, Najla Abdul Aziz, 2022

Entitled "The Reality of Employing Modern Technologies in Teaching Physical Education in Secondary Schools in the Kingdom of Saudi Arabia," the study aimed to determine the extent to which modern technologies (movement applications, analytical videos, and smart boards) are employed in classes, as well as to identify the digital competencies required by physical education teachers. It was conducted on a stratified sample of (95) male and female physical education teachers in secondary education. The most important results showed that technology is mostly employed in theoretical aspects, while its practical application remains weak. The results also indicated that a lack of training is the biggest factor limiting its use, and that the availability of digital equipment is not sufficient unless it is integrated into clear

methodological plans. Furthermore, it is necessary to develop a framework of standards for digital competencies for physical education teachers.

5- Study: Mohamed Abushafa, Mohamed Albeshti, Fuzia Mandra, 2020

Titled: "Experiences of Blended Learning in Libyan Higher Education"

This study confirms that blended learning represents an effective model for developing teachers' skills in Libyan higher education, as it combines direct interaction with modern technologies and contributes to achieving international educational standards.

Furthermore, integrating the international dimension and technology enhances the quality of education and prepares teachers and students to compete in a global educational environment.

Utilizing Previous Studies:

By reviewing and clarifying previous studies that shed light on many scientific landmarks utilized in this research, several key points were identified. These points enabled the researchers to formulate the research objectives in terms of methodology. Most studies agreed on the descriptive approach as the most suitable for this type of research. Furthermore, previous studies allowed the researchers to select the most appropriate measurement tools, commonly used in research, and suitable for this research. They also enabled the researchers to choose the most appropriate statistical methods for data processing to achieve the research objective. Finally, these studies helped the researchers establish the general framework for the research.

Research Procedures

Research Methodology

The research employs the descriptive approach due to its suitability to the research nature.

Research Population

The research population consists of all faculty members in the Colleges of Physical Education and Sports Sciences in the Western Region. This population was selected to assess the readiness of curricula for digital development according to modern educational quality standards, and to determine the level of faculty proficiency in using digital technologies in teaching and practical instruction.

Research Sample

The study sample was selected purposively from the research population, which consisted of faculty members in the Colleges of Physical Education and Sports Sciences in the Western Region. The sample comprised (100) faculty members distributed across the colleges in the Western Region for the academic year 2024-2025.

Data Collection Tools

The researchers relied on a questionnaire to assess the readiness of physical education curricula for digital transformation. This questionnaire was designed by the researchers with the assistance of experts in the field of digital transformation and is detailed as follows:

The current questionnaire was designed within a systematic scientific framework aimed at measuring the quality of e-learning in educational institutions according to contemporary academic accreditation standards. The construction process was based on specific standard indicators representing the dimensions of quality in digital education, ensuring consistency between the research instrument and the theoretical and normative framework of the study. This underscores the importance of developing measurement tools to guarantee validity, reliability, and generalizability.

The questionnaire was developed based on a set of indicators from the e-learning quality standard, encompassing key dimensions related to:
- Digital infrastructure and equipment
- Production and management of digital content
- Technical support and educational services
- Faculty digital proficiency. These indicators were transformed into main themes within the questionnaire, with each item reflecting one or more of the standard's indicators. The questionnaire items were formulated according to the following organized scientific steps:
- Analyzing the standard indicators and identifying the sub-dimensions for each indicator.
- Translating the indicators into measurable behaviors or practices within the educational environment.
- Formulating the items in a clear and direct questionnaire format that is easily respondable to by the sample.
- Ensuring no duplication or overlap between items while maintaining comprehensive measurement.
- Linking each item to one or more of the standard's indicators to ensure structural consistency. Thus, the items became suitable for the nature of the adopted quality standard indicators. To ensure the instrument's quality and scientific validity, the questionnaire was reviewed by a group of experts specializing in e-learning, educational technology, and quality assurance and academic accreditation. The experts examined the suitability of the items to the original indicators, assessed the clarity of the linguistic and scientific formulation, and confirmed the comprehensive coverage of the standard's domains. They suggested necessary modifications to some items and removed inaccurate or redundant ones. Based on their feedback, the required revisions were made, and the final version of the questionnaire was approved.

Following this scientific review process, it was determined that all questionnaire items were directly derived from the e-learning quality standard indicators. Therefore, all items were validated and approved in their final form for use in the research study.

Instrument Validity and Reliability

Questionnaire Validity

A content validity matrix was used, where five experts in physical education and digital technologies evaluated each questionnaire item on a 4-point scale (unsuitable, requires significant modification, partially suitable, fully suitable). The percentage of agreement of acceptable items was calculated, and all items achieved a score of 0.80, indicating good content validity.

Questionnaire Reliability

Internal reliability testing was conducted. The questionnaire was administered to a pilot sample of 15 faculty members who did not participate in the main sample. Cranach’s alpha coefficient was calculated for each questionnaire axis, as shown in the following table:

Table (1) shows the calculation of Cranach's alpha coefficient for each axis of the questionnaire.

Axis	Number of Items	Alpha Cronbach
Digital Infrastructure and Equipment	5	0.88
Digital Content and Curriculum Integration	5	0.86
Faculty Digital Proficiency	5	0.90
Digital Teaching Practices	5	0.87
Challenges and Obstacles	5	0.85
Complete Questionnaire	25	0.91

The results in Table (1) indicate that the reliability coefficients calculated using Cranach's alpha coefficient came within high levels for all the axes of the questionnaire, as the values ranged between (0.85) and (0.90), while the overall reliability coefficient of the questionnaire reached (0.91). It is noted that all the values exceeded the minimum acceptable limit in educational and standard studies, which is usually estimated at (0.70), and they also exceed the good level that starts from (0.80), which indicates a high degree of internal consistency between the items of each axis of the instrument. The fact that the digital competence axis of faculty members obtained the highest value (0.90) reflects strong homogeneity between its items, which indicates the accuracy of measuring this dimension in particular. In contrast, the challenges and obstacles axis had the lowest relative value (0.85), but it remains within the high reliability range, confirming the stability of this dimension's measurement and the absence of significant dispersion in item responses. As for the instrument as a whole, Cranach's alpha value (0.91) indicates a very high degree of internal consistency, enhancing the questionnaire's reliability and suitability for use in field research. This confirms that the items measure a coherent conceptual framework consistent with the study's theoretical dimensions.

The basic study: The questionnaire was distributed to faculty members in physical education colleges in the Western Region during the period between January and February of the 2025-2026 academic year.

Statistical analyses: - Arithmetic mean - Standard deviation - Correlation coefficient

Table (2) shows the analysis of data using (arithmetic mean and standard deviation)

Interpretation of result	Standard deviation	Arithmetic mean	Maximum	Minimum	Number of items	Axis
Advanced Intermediate	0.72	3.60	5.0	2.0	5	Infrastructure
Average	0.80	3.42	5.0	1.8	5	Digital Content
Advanced Intermediate	0.78	3.50	5.0	2.2	5	Digital Competence
Average	0.85	3.30	5.0	1.6	5	Digital Practices
Average to High	0.70	3.70	5.0	2.0	5	Challenges and Obstacles

The results in Table (2) indicate that the average responses of the sample members on the questionnaire axes were generally within the average level, with slight variations between the axes. The Challenges and Obstacles axis received the highest arithmetic mean (3.70), indicating that this aspect is the most prominent and influential from the sample members' perspective, reflecting the existence of noticeable difficulties that require addressing and development. The Infrastructure axis and the Digital Proficiency axis were within the (Advanced Average) level, with averages of (3.60) and (3.50) respectively, indicating a

relatively good level of digital equipment and proficiency, but one that still needs strengthening to reach a high level. In contrast, the Digital Content axis (3.42) and the Digital Practices axis (3.30) recorded the lowest averages, both falling within the average level, indicating that these aspects still require further development in terms of digital production and its applications in the educational process. The standard deviations ranged between (0.70 – 0.85), which are relatively close values, indicating an acceptable degree of homogeneity in the responses of the sample members and a lack of significant dispersion. Their opinions.

Table (3) shows the correlation coefficient and the relationship between the axes

Relationship between axes	Correlation ship coefficient	Variable 2	Variable 1
0.001	0.62	Digital competence	Infrastructure
0.002	0.58	Digital practices	Digital Content
0.001	0.65	Digital practices	Digital Competence

The table shows that there are strong positive correlations between infrastructure, digital competence, and digital teaching practices.

Results Analysis:

The descriptive analysis revealed that the average participant rating for the Digital Infrastructure and Equipment axis was (3.60/5) with a standard deviation of 0.72, indicating an advanced average level. This reflects the availability of some modern devices, such as computers, tablets, internet access, and e-learning software, albeit to varying degrees across colleges. Despite this infrastructure, limited resources and a lack of sufficient specialized software hinder the full integration of digital transformation. The average rating for Digital Content was (3.42/5) with a standard deviation of 0.80, indicating an average level. The analysis suggests that existing digital materials often cover theoretical aspects, with a lack of integration with practical activities. The results also showed that the alignment between curriculum objectives and digital content is not always sufficient, and that digital assessment has not been systematically integrated in most colleges. The axis showed an average of (3.50/5) with a standard deviation of 0.78, reflecting an advanced average digital proficiency among faculty members. Most professors possess basic knowledge of digital software, but the ability to design activities... The interactivity and use of advanced analytical tools (such as digital motion analysis) are key factors, but the lack of ongoing training is a major obstacle hindering faculty members' ability to effectively utilize technology. The mean score for this axis was (3.30/5) with a standard deviation of 0.85, indicating an average level of practical application of digital technologies. The analysis suggests that the integration of smart applications, educational videos, and digital analysis is limited, and that their use is concentrated on supporting theoretical activities rather than practical ones. A strong positive correlation ($r = 0.65$, $p < 0.01$) between digital competence and digital practices demonstrates that increased faculty competence leads to improved digital practice in classrooms. The mean score (3.70/5) with a standard deviation of 0.70 indicates moderate to high obstacles affecting the implementation of digital transformation. The most prominent challenges are the lack of specialized hardware and software, weak technological infrastructure, the absence of a clear standard framework for digital transformation requirements, insufficient ongoing training, and limited time allocated to practical activities. These findings are consistent with previous studies (Ali, 2025; Al-Harthi, 2022) that indicated a lack of resources and training. These represent major obstacles to integrating technology into physical education.

Conclusions

1- The results indicate that the digital infrastructure in physical education and sports science colleges in the Western Region is moderately advanced, but insufficient to support full digital transformation due to a lack of some modern devices and specialized software.

2- Analysis of digital content and curriculum integration revealed a gap between curriculum objectives and available digital materials. Digital content focuses on theoretical aspects without effective integration of practical activities, and digital assessment tools have not been systematically integrated.

3- The digital proficiency level of faculty members is moderately advanced. Most professors possess basic knowledge of digital software, but their ability to design interactive activities and use advanced analytical tools remains limited. A lack of continuous training is a major factor limiting the effectiveness of implementation.

4- Digital teaching practices in colleges remain limited. Digital technologies are mostly employed to support theoretical aspects, with weak integration of smart applications, educational videos, and digital analysis into practical activities.

5- There are clear obstacles to digital transformation, most notably: a shortage of devices and software, weak infrastructure, the absence of a clear standard framework, insufficient continuous training, and time constraints. Designated for practical activities.

6- The results show a strong positive correlation between digital proficiency and digital teaching practices, meaning that improving faculty members' digital skills leads to greater integration of technology in education.

Recommendations:

1- Develop the digital infrastructure by providing modern devices, stable internet networks, and specialized educational software to support practical and theoretical teaching.

2- Establish e-learning management systems that encompass all courses.

3- Enhance digital content and design integrated digital modules that link the theoretical and practical aspects.

4- Systematically integrate digital assessment tools into all lessons.

5- Enhance faculty members' competence by organizing regular training programs to develop digital skills, including the use of analytical tools and digital motion analysis.

6- Encourage faculty members to design interactive digital learning activities.

7- Promote digital teaching practices by encouraging faculty members to use smart applications and educational videos in practical lessons.

8- Integrate digital learning with traditional teaching methods to increase student engagement and improve their achievement.

9- Develop a standardized framework for digital transformation requirements by preparing a comprehensive guide or framework that defines the essential requirements for digital transformation according to educational quality standards. Modernization.

10- Addressing administrative obstacles by adjusting class schedules to allocate sufficient time for digital practical activities, as well as coordinating between colleges and departments to ensure the availability of required resources and software.

References

1- Al-Sultan, A. (2021). Digital Transformation in Education: Concepts and Applications. Riyadh: King Fahd National Library.

2- Al-Omari, N. (2023). Digital Transformation in Public Education According to Vision 2030: Requirements and Challenges. Journal of Contemporary Education.

3- Al-Yousef, F., and Al-Salmi, R. (2022). Digital Educational Quality Standards in Curricula: An Analytical Study. Journal of Educational Sciences.

4- Hassan, S., and Abdulaziz, M. (2021). Using Wearable Technologies in Physical Education Lessons: Reality and Challenges. Journal of Physical Education and Sports Research.

5- Ali, Wasan Hussein. (2025). Digital Transformation and its Role in Achieving Institutional Excellence for Colleges of Physical Education and Sports Sciences in Iraq. Journal of Sports Science and Physical Education, University of Baghdad.

6- Al-Awawdeh, Muhammad Mahmoud. (2023). The Extent of Physical Education Teachers' Use of E-Learning in Public Schools in Jordan. Journal of Educational Studies, University of Jordan.

7- Al-Harthi, Najla Abdul Aziz. (2022). The Reality of Employing Modern Technologies in Teaching Physical Education in Secondary Schools in the Kingdom of Saudi Arabia. Journal of Education and Humanities, Umm Al-Qura University.

8- Jassim, Abdul Rahman Muhammad. (2023). The Effectiveness of Using Smart Applications in Improving Students' Skills in Physical Education. Journal of Physical Education and Sports Research, University of Mosul.

9- Abushafa, M., Albeshti, M., & Mandra, F. (2020).Experiences of blended learning in Libyan higher education. ResearchGate.

10- AECT. (2019). AECT standards for educational technologies. Association for Educational Communications and Technology.

11- Bailey, R., & Kirk, D. (2020). The future of physical education: Technology, innovation, and digital pedagogy. Physical Education and Sport Pedagogy, 25(6), 567–583.

12- ISTE. (2021). ISTE standards for educators. International Society for Technology in Education.

13- OECD. (2021). Digital education outlook 2021: Learning in the digital age. Organisation for Economic Co-operation and Development.

14- UNESCO. (2023). Global education monitoring report: Technology in education. United Nations Educational, Scientific and Cultural Organization.

15- World Health Organization. (2022). Physical activity factsheet. WHO Press.