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A proposed strategic vision for enhancing an attractive and engaging school environment in the era of technological transformation

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Abstract

This study aimed to identify the level of availability of elements of an attractive school environment in the age of technology from the perspective of educational leaders. It also sought to determine the main dimensions of educational technology that contribute to enhancing the attractiveness of the school environment, propose a developmental vision for improving this environment in light of technological transformation, and explore the challenges facing its activation. A mixed-methods approach (quantitative and qualitative) was adopted. The study was conducted on a sample of 545 educational leaders, including principals, vice-principals, and supervisors, in addition to a qualitative sample of 50 participants who were interviewed using a semi-structured format. The results revealed that the availability level of attractive school environment components in the age of technology was high from the perspective of educational leaders. The most influential technological dimension contributing to school attractiveness was the use of digital learning platforms and interactive e-learning tools. However, the findings indicated that weak digital infrastructure represents the greatest challenge facing Arab schools in creating smart and attractive educational environments. The study emphasizes the need for educational policies that promote comprehensive digital transformation and empower educational leaders with digital leadership and management skills to ensure a motivating and effective school environment in the technological era.

Keywords: Attractive school environment, Technological transformation, Educational leadership, Digital learning, School leadership, Smart educational environment, Digital transformation in education, Educational leaders

Introduction

Education worldwide is undergoing radical transformations amid the digital and technological revolution. The school environment is no longer merely a place for traditional knowledge acquisition; rather, it has become a dynamic and integrated space that seeks to equip learners with twenty-first-century skills such as creativity, critical thinking, problem-solving, and effective communication. In this context, the concept of an *attractive school environment* has emerged as one of the fundamental pillars for achieving educational quality and ensuring the sustainability of the educational process in light of the rapid technological changes (UNESCO, 2022).

Educational institutions in the Arab world are facing increasing challenges amid digital transformation and the technological revolution. It has become necessary to redesign school environments to make them more attractive and aligned with the requirements of the twenty-first century. International reports indicate that attractive learning environments that incorporate modern technology enhance students' motivation to learn, improve educational outcomes, and prepare a generation capable of interacting with the demands of the digital labor market (UNESCO, 2022; OECD, 2023).

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An attractive school environment is considered one of the main pillars of educational quality and motivation for both students and teachers. Some researchers define it as an environment that achieves a balance among the psychological, social, and technological aspects of schooling, enhancing belonging, motivation, and positive interaction among all members of the educational institution (Al-Khatib, 2020; Ahmad & Abdullah, 2021). OECD (2021) also notes that schools fostering attractive learning environments rely on technological innovation and stimulating social interaction, which increase students' engagement and active learning.

The dimensions of an attractive school environment are multifaceted: The human dimension focuses on positive teacher–student relationships, psychological and social support for students, and fostering a sense of belonging (Salem, 2022). The material and technological dimension includes equipping classrooms with modern technological tools such as computers, smart boards, and interactive learning platforms, allowing students to experience more dynamic learning (Fahd, 2021; Hassan et al., 2023). The administrative and leadership dimension encompasses school leadership styles and organizational decisions that foster an attractive learning environment. Educational leaders play a crucial role in cultivating school culture, promoting innovation, and adopting modern technologies (Heenan et al., 2024; Matzavinou et al., 2025).

Modern technology is a key factor in designing attractive school environments in the techno era. Studies have shown that integrating digital tools and artificial intelligence in education enhances student engagement and motivates self-directed learning and innovation (Hassan et al., 2023; Alenezi, 2021). Technology can also provide teachers with real-time data on student performance, helping them adapt instructional methods to individual student needs (Onan, 2024).

Educational leadership plays a pivotal role in creating an attractive school environment. Studies indicate that transformational and digital leadership enhance teachers' innovative capacities and support a school culture that encourages active participation and engagement (Antonopoulou et al., 2025; See et al., 2024). Effective leadership strategies include building trust, empowering teachers, developing digital skills, and fostering a continuous learning environment (Frelin, 2025; Akyürek & Karabay, 2022).

Educational leaders are primarily responsible for shaping educational policies and developing strategic plans aimed at establishing attractive school environments. They set the vision for integrating technology in education, allocate financial and human resources, encourage innovation and experimentation, and prepare the school community to embrace change and adopt new digital tools (Mahasneh, 2020).

The benefits of attractive school environments in the techno era include enhancing school belonging, improving academic performance, increasing teacher satisfaction, and encouraging creativity and innovation among all school members (Salem, 2022; Fahd, 2021). Moreover, such environments reduce students' behavioral problems and improve social interaction, positively influencing the overall quality of education.

However, schools face several challenges when attempting to implement technologically enhanced attractive environments, including limited material and technical resources, insufficient digital skills among teachers, resistance to change, and some leaders' lack of capacity to effectively manage digital transformation (Gkrimpizi, 2023; Alenezi, 2021). Therefore, comprehensive strategies are required, encompassing teacher and leadership training, the provision of suitable infrastructure, and fostering a school culture supportive of innovation and technology.

The reviewed studies and literature indicate that the success of an attractive school environment in the techno era depends on the integration of human, technological, and leadership dimensions, with a focus on effective leadership and innovative technologies to create a stimulating educational environment for all school stakeholders (Al-Khatib, 2020; OECD, 2021; Matzavinou et al., 2025).

An attractive school environment thus represents the integration of physical, digital, psychological, social, and administrative components that enhance the motivation of both students and teachers. An attractive school addresses students' psychological

and social needs, provides a positive climate that encourages participation, and invests in modern technologies to deliver interactive education aligned with the demands of the digital labor market (OECD, 2023).

The topic of attractive school environments in the techno era has gained increasing attention in recent years due to its direct impact on educational quality and the motivation of students and teachers alike. Al-Khatib's (2020) study found that human factors, such as positive teacher–student relationships, complement technological factors like the availability of digital tools to create more engaging school environments. The study recommended developing training programs for educational leaders to effectively integrate technology into school management.

Similarly, Ahmad and Abdullah (2021) found that integrating modern technology into schools increases teacher satisfaction and motivation to innovate, emphasizing the crucial role of educational leaders in managing digital transformation and ensuring a stimulating school environment. Fahd (2021) reported that technologically equipped schools enhance teacher innovation, highlighting the need to integrate technology gradually into school culture to ensure teacher acceptance and creativity.

At the international level, the OECD (2021) study revealed that integrating digital technologies into innovative learning environments promotes student engagement and school attractiveness, emphasizing the role of educational leaders in directing this transformation and adapting school environments to students' needs. Salem (2022) confirmed that schools equipped with modern technologies foster students' sense of belonging and active participation, unlike traditional schools that lack such motivation, recommending innovative strategies for incorporating technology into classroom and space design.

Hassan et al. (2023) demonstrated that using AI tools, such as interactive learning platforms, enhances teachers' ability to adapt school environments to students' needs and recommended strategic plans for technological modernization. Heenan et al. (2024) emphasized that transformational leadership plays a vital role in strengthening school attractiveness by promoting trust, empowerment, and a positive school culture.

Matzavinou et al. (2025) focused on the impact of digital leadership on teachers' efficiency in elementary schools, showing that digital leadership improves teachers' digital competencies and, consequently, the quality of the school environment. Antonopoulou et al. (2025) found that digital leadership enhances teacher satisfaction and adoption of digital practices, calling for leadership strategies centered on digital transformation in schools.

Akyürek and Karabay (2022) developed a scale for innovative school leadership to assess teachers' perceptions of attractive school environments, confirming that innovative leadership motivates better teacher performance. Onan (2024) found that digital transformation and leadership in higher education are key to improving educational quality.

See et al. (2024) emphasized that school leadership makes teaching more engaging through clear strategies for fostering stimulating environments, while Frelin (2025) compared innovative and traditional learning environments, highlighting leadership's role in designing attractive and effective educational settings. Finally, studies by Gkrimpizi (2023) and Alenezi (2021) discussed challenges and strategies related to digital transformation in higher education, stressing leadership's role in managing these strategies to achieve engaging and motivating learning environments.

Collectively, these studies suggest that the attractiveness of school environments in the techno era depends on the integration of technology and effective leadership. Educational leaders play a pivotal role in creating motivating environments for students and teachers, enhancing innovation and belonging, while addressing the modern digital and technological challenges.

Statement of the problem

Educational research has consistently shown that the integration of technology into learning environments contributes to improved student performance and increased engagement. E-learning and blended learning enhance interaction between teachers and

students and open avenues for modern instructional approaches such as collaborative learning, project-based learning, and virtual laboratories (Al-Harbi, 2021). According to the World Bank (2023), schools that adopt and integrate technology into their educational policies achieve higher levels of satisfaction and academic achievement compared with traditional environments.

Contemporary education is undergoing unprecedented transformations driven by the digital revolution, which has reshaped the nature of knowledge, modes of learning, and instructional practices in schools. Technology has become a central pillar in the development of modern educational environments (UNESCO, 2023).

Technology also provides unprecedented opportunities to build attractive learning environments through the use of artificial intelligence systems to monitor student progress, augmented and virtual reality to enrich curricula, and digital learning platforms that promote autonomous and self-directed learning (World Bank, 2023). These developments require educational leaders to invest in these tools to enhance educational quality and support digital transformation in educational institutions.

The modern school is no longer merely a place for knowledge transmission; it must become an attractive educational environment—both digital and human—that stimulates creativity, nurtures skills, fosters belonging, and leverages technological potential to serve pedagogical goals (Al-Harbi, 2022; Al-Shammari, 2021).

An attractive school environment extends beyond technological aspects to encompass supportive social and psychological structures. Students need to feel secure, connected, and engaged in a fair and participatory learning climate (Al-Zyoud & Alkhawaldeh, 2021). Studies have confirmed that students who perceive their school environment as psychologically and socially supportive demonstrate higher levels of academic achievement and develop life skills that enable them to adapt to future challenges (Khalil & Bashir, 2022).

Arab and international studies have emphasized that an attractive school environment in the technological era represents one of the main indicators of educational quality, combining a supportive psychosocial climate, modern digital infrastructure, and effective leadership capable of managing digital transformation (Ayasrah et al., 2025; Al-Hawawsheh, 2021).

Although many Jordanian schools have taken steps toward digital transformation through national initiatives such as *Darsak* and the "Smart School" programs, recent reports indicate that available digital infrastructure has not always translated into truly engaging environments that motivate students and teachers toward creativity and learning (Jordanian Ministry of Education, 2023; National Center for Human Resource Development, 2022).

Ayasrah et al. (2025) found that digital leadership and technological innovation significantly enhance educational performance in Jordanian secondary schools, and that the effectiveness of the educational environment is closely tied to the competence of educational leadership in managing technology tools. Similarly, Al-Hawawsheh (2021) reported that the level of e-leadership practice in Jordanian schools remains moderate, emphasizing the need to strengthen leaders' awareness of their roles in building stimulating digital environments. Momani et al. (2025) also confirmed that digital leadership in private Jordanian educational institutions contributes to the creation of "smart organizations," highlighting that an attractive school environment can only be achieved through conscious and innovative digital leadership.

Comparable findings were reported by Al-Kandari (2024) in Kuwait and Al-Abdullatif & Alsubaie (2022) in Saudi Arabia, indicating that the effectiveness of digital learning environments depends not only on the integration of technology but also on cultivating a comprehensive digital culture that enhances teacher–student interaction and fosters an engaging learning climate.

Tian et al. (2024) demonstrated that teaching quality and professional empowerment of teachers are key factors influencing the attractiveness of educational institutions, confirming that school appeal cannot be separated from instructional quality.

In the Arab context, schools face several challenges

related to limited technological infrastructure, insufficient investment in digital resources, and resistance among teachers or administrators to adopting technology—factors that hinder schools' ability to transform into attractive learning environments (Al-Khaldi, 2023). Nevertheless, notable regional initiatives, such as the UAE and Saudi Arabia's digital transformation programs, aim to reshape school environments according to global standards of innovation and competitiveness (Arab League Educational Report, 2023).

Studying the attractive school environment in the technological era from the perspective of educational leaders thus represents a valuable contribution to the field of contemporary educational research, linking technological, administrative, psychological, and social dimensions. This study also seeks to offer practical recommendations that help policymakers build school environments capable of addressing future challenges, achieving sustainable development goals in education, and ensuring the quality and effectiveness of the learning process.

Field studies, however, reveal a clear gap between the theoretical aspirations advocating for technology-based school environments and the actual realities of Arab schools, many of which continue to struggle with weak digital infrastructure, limited technological investment, and inadequate teacher competencies in technology integration (Al-Harbi, 2021; Al-Khaldi, 2023).

Several studies have recommended the development of national and institutional strategies to build attractive learning environments through teacher empowerment, continuous professional training, and the integration of artificial intelligence and interactive educational applications aligned with learners' needs (Alenezi, 2020; Saleh & Qasem, 2022). They have also emphasized the vital role of educational leadership in formulating adaptive policies to overcome resistance to change and ensure the sustainability of digital transformation (Al-Khaldi, 2023; Hassan, 2024).

In light of the foregoing, there remains a clear gap between the technological tools available in Jordanian schools and their effective use in creating engaging school environments that reflect learners' needs and the requirements of the knowledge society. Furthermore, educational leaders' understanding of the dimensions of such environments and their roles in developing them has not been sufficiently explored in the Jordanian context, even though these leaders are the driving force behind innovation and digital transformation in schools (Al-Harthi & Al-Balushi, 2022).

Hence, the problem of the study stems from the need to examine the reality of attractive school environments in the technological era from the perspective of educational leaders in Jordanian schools and to determine the extent to which their technical, psychological, educational, aesthetic, and leadership dimensions are available, along with the challenges associated with their development.

Research questions

1. What is the level of availability of the elements of an attractive school environment in the technological era from the perspective of educational leaders?
2. What are the most prominent dimensions of educational technology that contribute to enhancing an attractive school environment from the perspective of educational leaders?
3. What are the proposed strategies for promoting an attractive school environment amid technological transformation?
4. What challenges face the implementation of attractive school environments in the technological era from the perspective of educational leaders?

Significance of the study

This study derives its importance from its focus on the attractive school environment in the technological era from the perspective of educational leaders—a contemporary topic central to the modernization of education and its alignment with the digital revolution and knowledge transformation.

Theoretical significance

1. The study enriches educational thought by addressing the concept of the attractive school environment within the context of digital transformation—a field still requiring further research in Arab educational settings.

2. It provides an integrated theoretical framework linking effective educational leadership, digital transformation, and learning environments, thereby offering a scientific model for understanding factors that make schools stimulating and attractive for students and teachers.
3. It expands educational knowledge on the role of technology in improving school climate and educational quality in line with global trends toward smart and sustainable schools.
4. It serves as a foundation for future research on variables related to school attractiveness, such as motivation, job satisfaction, educational innovation, and digital leadership.

Practical significance

1. The study enables educational leaders to assess the current status of attractive school environments and identify strengths and weaknesses in the use of technology within schools.
2. It provides decision-makers with actionable insights for developing educational plans and standards that promote stimulating and integrated school environments in the digital era.
3. The findings can guide the design of professional development and training programs for school principals and teachers to manage modern learning environments effectively.
4. The study contributes to improving the quality of school education by proposing mechanisms to enhance positive interaction, belonging, and student motivation.
5. Its outcomes offer practical support for national digital transformation initiatives, helping build schools that align with the needs of the future and twenty-first-century skills.

Definition of terms

1. School environment :Defined as "a set of physical, human, social, and organizational conditions that surround students and teachers and shape the overall climate of the educational process" (Al-Khatib, 2020; Salem, 2022). *Operationally*, in this study, it refers to the general atmosphere of the school—including human, material, and administrative dimensions—as measured by educational leaders' responses to the study instrument.

2. Attractive school environment : Defined as "an educational climate that engages students and teachers by providing a stimulating and supportive setting for learning and creativity using modern resources" (OECD, 2021; Fahd, 2021). *Operationally*, it refers to the extent of availability of psychosocial support, technological facilities, and leadership practices that foster engagement, as measured by the study tool.

3. Technological era (techno-era) : Refers to the current stage characterized by increasing reliance on digital technologies and artificial intelligence across all fields, including education (Alenezi, 2021; Gkrimpizi, 2023)..*Operationally*, it denotes the degree to which schools utilize digital technologies (smart devices, e-platforms, educational apps) to build engaging learning environments.

4. Educational leadership : Defined as "a set of administrative and organizational processes carried out by leaders in educational institutions to direct the learning process and achieve its objectives" (Bush, 2018; See et al., 2024). *Operationally*, it refers to school principals, vice-principals, and educational supervisors who constitute the main study population.

Research Methodology

The present study adopted a mixed-method research design, which combines the quantitative descriptive-analytical approach with the qualitative interpretive approach. This design is employed when there is a need to integrate numerical data with descriptive information to gain an in-depth understanding of the phenomenon under investigation. It represents the most suitable choice for studying the topic of the attractive school environment in the techno era, as it allows for identifying general trends among educational leaders (quantitative aspect) while exploring their opinions and experiences in greater depth (qualitative aspect) (Creswell & Plano Clark, 2018).

The quantitative component of the study involved the

use of a questionnaire instrument that was constructed based on theoretical literature and previous empirical studies.

The qualitative component was represented by semi-structured interviews conducted with a sample of 50 educational leaders to gain a deeper understanding of their views regarding the requirements of an attractive school environment, the challenges they face, and the proposed solutions. Respondents were encouraged to express their views freely, which added an interpretive dimension to the quantitative findings.

Study population

The study population included all educational leaders (school principals, assistant principals, and educational supervisors) working in both public and private schools.

Study sample

- **Quantitative sample:** A random sample consisting of 545 participants.
- **Qualitative sample:** A purposive sample of 50 educational leaders who possessed diverse experiences and were capable of providing in-depth information.

Research Instrument

The study utilized a mixed-method approach, integrating both the descriptive-analytical quantitative method and the interpretive qualitative method, with the aim of obtaining precise quantitative data and in-depth qualitative data to enhance the interpretation of results.

To achieve the study objectives and answer its questions, a primary instrument was developed, consisting of a questionnaire directed to educational leaders and semi-structured interviews with selected school principals and educational supervisors.

The questionnaire

The questionnaire was designed after a comprehensive review of both Arabic and international studies that addressed the topic of the attractive school environment and technological transformation in education, in order to benefit from their structural models and theoretical dimensions.

Among the most significant studies reviewed were: Al-Harbi (2022), which examined the school environment in light of digital transformation; Al-Shammari (2021), which explored the role of active learning in building an attractive learning environment; Ahmad and Abdullah (2021), which investigated the relationship between the school environment and students' academic achievement; Antonopoulou et al. (2025), which focused on digital leadership and teachers' competencies in modern learning environments; and Momani et al. (2025), which analyzed the impact of digital leadership on the creation of smart learning environments in Jordanian universities.

The structural framework of these studies was used as the basis for identifying the five dimensions of the questionnaire, with necessary modifications to ensure compatibility with the Arab educational context and the ongoing technological transformation in school education, reflecting the needs of educational leaders in the current stage of digital transition.

Questionnaire dimensions

The questionnaire included five main dimensions representing the components of an attractive school environment in the technological era:

- **Physical and technological environment** (e.g., availability of digital infrastructure and modern educational technologies).
- Supportive Human Relations (e.g., collaboration, respect, and institutional belonging).
- **Motivational school leadership** (e.g., encouragement of innovation and the use of digital leadership).
- Educational Activities and Programs (e.g., integration of interactive and technological activities in the teaching process).
- **Psychological and social support systems** (e.g., provision of supportive environments for mental health and adaptation to technological change).

Items were measured using a five-point Likert scale, ranging from 1 = Very Low to 5 = Very High.

Semi-structured interviews

The semi-structured interviews were used to collect qualitative data that complemented the quantitative findings. Open-ended questions were developed to explore educational leaders' experiences and suggestions for enhancing the attractiveness of the school environment.

The interview questions were designed based on findings from previous related studies, including Hassan (2024) on educational leadership in digital schools, and Al-Hawawsheh (2021) on e-leadership in Jordanian schools.

Validity and reliability of the instrument

To ensure the validity and reliability of the research instrument, several scientific procedures were undertaken.

Content validity was verified by presenting the questionnaire to a panel of experts in educational administration, instructional technology, and research methodology to assess the clarity, comprehensiveness, and representativeness of the items in capturing the dimensions of an attractive school environment. Based on their feedback, certain items were revised or rephrased to align with the Jordanian educational context and research standards.

Reliability was assessed through a pilot application of the questionnaire to a small exploratory sample of educational leaders not included in the main study sample. The Cronbach's Alpha coefficient was calculated for each dimension and for the overall instrument, with values ranging between 0.78 and 0.91, indicating strong internal consistency and high reliability.

Accordingly, the instrument was deemed suitable for application to the main study population, as it demonstrated construct and content validity, and proved to be reliable and capable of accurately measuring the dimensions of an attractive school environment within the context of technological transformation.

Results and Discussion

Research question 1:

What is the level of availability of the elements of an attractive school environment in the techno era from the perspective of educational leaders?

Table (1) The level of availability of the elements of an attractive school environment in the techno era from the perspective of educational leaders

Dimension	Mean	Standard Deviation	Level	Rank
Physical and Technological Environment	4.27	0.65	High	1
Supportive Human Relations	4.15	0.66	High	2
Motivational School Leadership	3.95	0.77	High	3
Educational Activities and Programs	3.65	0.73	Moderate	4
Psychological and Social Support Systems	3.70	0.78	Moderate	5
Overall Mean	3.94	0.90	High	—

The table above presents the arithmetic means and standard deviations for the dimensions of the attractive school environment in the techno era from the perspective of educational leaders. The means ranged between 3.65 and 4.27, indicating that respondents generally perceived the dimensions of the attractive school environment to be at a high to moderate level, with an overall mean of 3.94.

The findings reveal that the physical and technological environment ranked first, reflecting schools' awareness of the necessity of establishing modern, technology-driven learning environments. This finding aligns with the results of Alqahtani & Alharthi (2022), who asserted that smart school environments are among the most critical enablers for the effective integration of artificial intelligence technologies. Similarly, McKinsey (2023) emphasized that investment in digital infrastructure is a prerequisite for achieving attractive and innovative learning settings.

The second-ranked dimension, supportive human relations, demonstrates the educational leaders'

recognition of the importance of a positive social climate in fostering creativity and motivation among students. This result supports Al-Omari et al. (2021), who found that positive human relations in educational settings directly enhance students' learning motivation. Likewise, Oyetade & Zuva (2025) highlighted that social support is a fundamental pillar for strengthening students' acceptance of modern technologies.

The school leadership dimension came in third place, indicating noticeable but insufficient efforts by educational leaders. Some institutions still face challenges related to administrative empowerment. This finding is consistent with Abu-Taieh et al. (2022), who demonstrated that transformational leadership is a key driver in transitioning universities toward modern and technology-enabled learning environments.

The educational activities and programs dimension, ranked fourth at a moderate level, suggests limited integration of AI-supportive and technology-based activities within curricula. This finding aligns with Al-Shehri et al. (2021), who recommended linking curricula with applied and technological programs to enhance smart learning outcomes.

Finally, psychological and social support systems ranked last, reflecting a weak emphasis on the human dimension amid the growing focus on technological aspects. This result corresponds with Hassan & Al-Khatib (2020), who reported that the absence of psychological support programs undermines both students' and teachers' ability to adapt to rapid digital transformations.

Research question 2:

What are the main dimensions of educational technology that contribute to enhancing an attractive school environment from the perspective of educational leaders?

Table (2) Key dimensions of educational technology contributing to the enhancement of an attractive school environment from the perspective of educational leaders

Educational Dimension	Mean	Standard Deviation	Level	Rank	Interpretation
Use of Digital Learning Platforms	4.40	0.60	High	1	Digital platforms improve access to learning materials and enhance students' motivation for self-learning.
Interactive Learning	4.25	0.63	High	2	Interactive activities such as simulations and digital quizzes enhance students' engagement and practical application of concepts.
Augmented and Virtual Reality	4.15	0.68	High	3	Provides immersive learning environments that foster deep understanding and critical thinking.
Artificial Intelligence in Education	4.10	0.70	High	4	Supports educational decision-making, personalizes learning based on individual abilities, and uses data analytics to improve performance.
Digital Assessment Tools	3.90	0.72	High	5	Continuous assessment through digital applications enables ongoing monitoring of student performance and identification of strengths and weaknesses.
Mobile Learning	3.87	0.74	High	6	Enables learning anytime and anywhere, increasing flexibility and promoting independent learning.
Multimedia Digital Content	3.85	0.76	High	7	Enriches the learning process through videos, simulations, and interactive materials, enhancing the attractiveness of education.
Collaboration via Digital Tools	3.83	0.78	High	8	Strengthens teamwork and communication between students and teachers through digital platforms.
Data Analytics and Learning Analytics	3.8	0.80	High	9	Uses educational data to support administrative and pedagogical decisions and to improve teaching quality.
Management of Digital Learning Content	3.77	0.82	High	10	Efficient organization and management of digital content facilitates resource access and promotes sustainable learning.

The analysis of educational technology dimensions reveals that technology is not merely a set of instructional tools but rather a comprehensive enabler that enhances the attractiveness of the school environment. Digital platforms, interactive learning, and augmented or virtual reality provide immersive educational experiences that encourage self-directed learning and active participation. These findings align with Alqahtani & Alharthi (2022) and OECD (2023), who emphasized that such technologies foster engagement and motivation among learners.

Artificial intelligence in education plays a pivotal role in personalizing learning experiences based on individual student capabilities and in analyzing performance data to guide targeted instructional interventions. This contributes to more informed decision-making by educational leaders regarding curriculum development and teaching strategies, consistent with the conclusions of Al-Omari et al. (2021) and Oyetade & Zuva (2025).

Digital assessment tools facilitate continuous monitoring and provide immediate feedback, thereby enhancing instructional efficiency and reducing learning gaps, as supported by Hassan & Al-Khatib (2020).

Furthermore, mobile learning and digital content management foster a flexible and inspiring educational environment, empowering students to learn autonomously—a trend highlighted in UNESCO (2022) reports.

Collaboration through digital tools strengthens teamwork and communication skills, promoting leadership and digital competence among students, consistent with Al-Shehri et al. (2021).

Lastly, data analytics and educational data utilization allow educational leaders to identify learning patterns, enhance quality assurance, and support sustainable school development, as emphasized by OECD (2023).

In summary, strategically integrating these technological dimensions not only improves academic learning outcomes but also creates a stimulating, innovative, and flexible school environment, enhancing both student and teacher satisfaction and commitment.

Question 3: What is the proposed vision to enhance an attractive school environment in light of technological transformation?

Vision

Transforming the school environment into an advanced and attractive model that relies on technology and artificial intelligence to enhance interactive learning, innovation, and the development of 21st-century skills among students and teachers, with a focus on inclusivity and sustainable quality. (*UNESCO, 2022; Alotaibi & Alshehri, 2023*)

Mission

Empowering educational leaders and teachers to design and implement innovative instructional strategies supported by technology and artificial intelligence to build an inclusive school environment that encourages independent and collaborative learning, supports innovation, and utilizes data analysis for evidence-based educational decision-making. (*Mahmood et al., 2022; Al-Omari et al., 2021*)

Strategic axes and activation methods

Table (3) Strategic axes and activation methods

Strategic Axis	Activation Methods	Related Objectives	Supporting Studies
Developing Digital Infrastructure	Establishing smart laboratories, updating devices and software, enhancing networks	Enabling access to digital learning and promoting interaction	UNESCO, 2022; Alotaibi & Alshehri, 2023
Enhancing Teachers' Professional Competencies	Training workshops, practical courses,	Improving teaching efficiency and encouraging	Mahmood et al., 2022; Alqahtani & Alharthi, 2022

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	incentives for continuous learning	technology adoption	
Integrating Interactive Learning and Augmented Reality	Implementing AR programs, organizing interactive projects	Enhancing critical thinking and innovation	Abu-Taieh et al., 2022; Al-Omari et al., 2021
Applying Artificial Intelligence in Education	Personalized learning, student data analysis, decision-support tools	Improving academic achievement and developing teaching strategies	Oyetade & Zuva, 2025; Al-Omari et al., 2021
Developing Multimedia Digital Content	Producing educational videos, interactive platforms, simulations	Increasing learning attractiveness and student motivation	Al-Shalabi, 2023
Promoting Mobile and Independent Learning	Educational apps, digital libraries, mobile learning tools	Enhancing flexibility and educational autonomy	UNESCO, 2022
Activating Digital Assessment Tools	Online tests, instant feedback, performance monitoring	Improving achievement and reducing learning gaps	Hassan & Al-Khatib, 2020
Enhancing Digital Collaboration and Teamwork	Digital communication platforms, group projects, interactive forums	Developing communication and teamwork skills	Al-Shehri et al., 2021
Using Educational Data and Analytics	Data analysis systems, performance indicators, periodic reports	Enabling evidence-based educational decisions	OECD, 2023
Developing Digital Transformation Policies and Strategies	Comprehensive strategies, implementation plans, measurement indicators	Ensuring sustainability of digital initiatives	Alqahtani & Alharthi, 2022; PwC, 2023
Promoting an Innovative and Inclusive Culture	Innovation competitions, inclusion programs for students with special needs	Enhancing creativity and achieving educational equity	UNESCO, 2022
Enhancing Partnerships and Community Engagement	Collaboration with universities, tech companies, and local communities	Supporting digital learning and technological initiatives	PwC, 2023; Alotaibi & Alshehri, 2023

General strategy

- Integrate the axes within a comprehensive digital transformation plan with a specific timeline for each axis.
- Set precise performance indicators to monitor the implementation of initiatives and the achievement of the vision.
- Activate collaboration among leaders, teachers, students, and the local community to ensure the success of initiatives.
- Periodically monitor and evaluate the impact

to update the strategy based on achieved results.

Expected impact

- A motivating and attractive school environment for students and teachers.
- Improved education quality and academic achievement.
- Enhanced innovation and 21st-century skills.
- Sustainability of inclusivity and digital initiatives in the educational process.

Question 4: What are the challenges facing the activation of an attractive school environment in the technological era from the perspective of educational leaders?

Table (4) The challenges facing the activation of an attractive school environment in the technological era from the perspective of educational leaders

Challenge / Constraint	Mean	Standard Deviation	Percentage (%)	Level	Rank	Interpretation
Weak digital infrastructure	4.25	0.66	85.00%	High	1	Lack of high-speed networks and modern devices hinders effective technology integration.
Shortage of trained human resources	4.20	0.70	84.0%	High	2	Insufficient training programs and weak technological preparedness among teachers.
Limited funding and financial support	4.19	0.73	83.80%	High	3	Low budgets allocated for technology in educational institutions.
Resistance to cultural and institutional change	4.15	0.75	83.0%	High	4	Some staff resist adopting new teaching methods.
Absence of clear policies and strategies	4.1	0.77	82.0%	High	5	Lack of strategic plans for integrating technology into the school environment.
Weak psychological and social support for teachers	4	0.80	80.0%	High	6	Absence of support programs for adapting to digital learning environments.
Weak integration between technology and curricula	3.98	0.76	79.60%	High	7	Lack of alignment between digital tools and curriculum content leads to partial and ineffective technology use.
Weak evaluation and continuous monitoring	3.95	0.78	79.0%	High	8	Lack of performance indicators for measuring the level of technology and AI integration in education.
Insufficient incentives and rewards for teachers	3.93	0.79	78.60%	High	9	Absence of motivation and rewards reduces teachers' willingness to adopt digital innovation.
Low public awareness of the importance of digital education	3.90	0.80	78.0%	High	10	Some administrators and parents lack awareness of the importance of technology in learning.

Findings and interpretation

1. Weak digital infrastructure :This is the most significant challenge facing Arab schools, as the lack of modern networks and smart devices impedes effective technological integration. This finding aligns with Alqahtani & Alharthi (2022) and UNESCO (2022), who emphasize that digital infrastructure is the foundation of successful technological transformation.

2. Shortage of trained human resources :The absence of intensive, in-depth training for teachers reduces the effectiveness of AI applications in education. This is consistent with Abu-Taieh et al. (2022) and Al-Omari et al. (2021), who stressed the importance of developing teachers' digital skills.

3. Limited funding and financial support : Insufficient budgets represent a major obstacle. Al-Shalabi (2023) found that sustainable funding is essential for developing modern learning environments, while the World Bank (2023) recommended increasing investment in digital education.

4. Resistance to cultural and institutional change: Adherence to traditional methods slows the adoption of innovation. This observation aligns with Al-Omari et al. (2021) and Oyetade & Zuva (2025), who discussed the impact of institutional culture on technology acceptance.

5. Absence of clear policies and strategies: The lack of strategic planning weakens AI integration in schools. Al-Shehri et al. (2021) recommended developing explicit strategies and accurate performance indicators to guide digital transformation.

6. Weak psychological and social support for teachers :The absence of support programs affects teachers' adaptation to digital education. Hassan & Al-Khatib (2020) emphasized that psychological support enhances teachers' willingness to adopt technological changes.

7. Weak integration between technology and curricula :The ineffective alignment between digital tools and curricular content limits smart learning. OECD (2023) and Alqahtani & Alharthi (2022) highlighted the importance of integrating technology coherently with educational objectives.

8. Weak evaluation and continuous monitoring : The lack of digital performance indicators makes it difficult to assess the success of technology initiatives. Abu-Taieh et al. (2022) also stressed the necessity of evaluating technological integration outcomes.

9. Insufficient incentives and rewards for teachers: The absence of financial and moral motivation reduces teachers' engagement in digital innovation. UNESCO (2022) identified motivation as a key factor for activating digital transformation in schools.

10. Low public awareness of the importance of digital education :Limited awareness among administrators and parents negatively affects technology adoption. Al-Omari et al. (2021) and Oyetade & Zuva (2025) underscored the role of awareness in promoting AI-based education.

Conclusions

1. Weak digital infrastructure remains the most significant challenge hindering the activation of attractive school environments, as many schools still suffer from limited internet connectivity, outdated devices, and insufficient technical support.
2. A shortage of digitally competent human resources constrains technological integration, with insufficient training and professional development programs for teachers and educational leaders.
3. Limited financial resources and funding represent a major obstacle, reducing the ability of schools to invest in sustainable digital transformation and artificial intelligence tools.
4. Resistance to cultural and institutional change continues to slow the adoption of innovation, as some teachers and administrators prefer traditional teaching approaches.
5. The absence of clear national and institutional policies for digital transformation weakens implementation and coordination among schools.
6. Lack of psychological and social support programs for teachers negatively affects their motivation and adaptability to digital learning environments.
7. Weak integration between technology and curricula results in superficial use of digital tools and limits the impact of smart learning initiatives.
8. Limited evaluation and monitoring mechanisms prevent schools from effectively measuring progress and identifying areas for improvement in technological adoption.

9. Insufficient incentives and rewards for teachers reduce enthusiasm for innovation and participation in digital initiatives.
10. Low public awareness of the importance of digital education affects community engagement and support for technology-driven learning.

Recommendations

1. Enhance digital infrastructure by providing high-speed internet, updated smart devices, and advanced interactive learning platforms in schools.
2. Develop continuous and structured professional training programs aimed at improving the digital competencies of teachers and educational leaders, linking such programs to professional advancement and performance incentives.
3. Allocate independent budgets for digital transformation within national educational plans to ensure sustainability and continuity of initiatives.
4. Promote a culture of innovation and change through awareness campaigns, school-based workshops, and national forums showcasing successful digital transformation practices.
5. Formulate clear national policies and strategic frameworks for educational digitalization, including measurable performance indicators and quality standards.
6. Establish psychological and social support systems for teachers and students to facilitate adaptation to the demands of technological change.
7. Integrate technology into curricula systematically, ensuring alignment between digital tools and pedagogical goals to enhance creativity, critical thinking, and engagement.
8. Implement continuous evaluation and monitoring systems to assess the effectiveness of digital transformation initiatives and guide data-driven improvements.
9. Provide incentives and rewards for digitally innovative teachers, such as recognition awards, professional growth opportunities, and performance-based promotions.
10. Strengthen partnerships with the private sector and local communities to support digital education initiatives and ensure the long-term sustainability of attractive and smart school environments.

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