The Factors of Digital Leadership Affected Administrative Effectivenessof Online Art Education at Educational Institution inBeijing

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Abstract

With the rapid development of digital technology and Internet applications, the scale of online education has also expanded, and art education is also showing such a trend. Clearly, more research is needed to improve the effectiveness of online learning. This is likely to provide educators and policymakers with ideas for designing future innovations in arts education. For this reason, this study aims to examine in detail how digital leadership factors affect the effectiveness of online arts education, using online arts education institutions in Beijing as an example.The factors of the study were the components of the digital leadership and administrative effectiveness of online art education in Beijing. and propose Structural Equation Modeling (SEM) of factors affecting administrative effectiveness of online art education in Beijing , and finally investigate the factors influencing for improving the effectiveness of online art education in Beijing.The research method adopts a mixed research method, including qualitative and quantitative research methods. The population were teachers and staffs of educational institution in Beijing. The total number were 1482 persons, and the respondent used for the study were 310 by G*Power software. The key informants for semi-structure interviews were 5 experts. The instruments used foe data collection were data record form; semi structured interview form and five-points rating scale questionnaire. Questionnaires have been received at the response rate of 100%. The statistic used for analyzing the data were descriptive statistics, CFA (Confirmatory Factor Analysis and SEM (Structural Equation Model). The results of this research were found that there were 5 factors affecting the effectiveness of digital leadership in online art education in Beijing. The most important were Digital Technology Literacy, The Structural Equation Modeling (SEM) of factors affecting the effectiveness of digital leadership in online art education in Beijing was fit with the empirical data by the value of Relative Chi-square = 216.091, Relative Chi-square = 0.965, GFI = 0.941, AGFI = 0.928, TLI = 1.003, RMR = 0.068, and RMSEA = 0.000. These indices suggest that the model fits the data well, supporting the specified relationships. According to the results of the research analysis, the conclusion is that only one factor, digital technology literacy, has a statistically significant direct impact on the effectiveness of digital leadership in online arts education in Beijing.

Keywords: Digital Leadership; Online Art Education; Educational Institutions in Beijing

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Introduction

The redevelopment of science and technology in today's era is rapid, and the trend of globalization and digitalization has gradually deepened and accelerated. The Fourth Industrial Revolution has changed the way we work and study, which in turn affects the business, organizational and social patterns. The field of education is developing and changing in such a background. UNESCO (UNESC0, 2013) pointed out that mobile learning has begun to develop rapidly. At present, there are more than 6 billion mobile phone users in the world, and the number of people using mobile devices to surf the Internet is twice that of desktop computers. Other challenges include blockchain, 3D printing, Internet of Thing, cloud technology, artificial intelligence, learning and analysis technology, robotization, social learning and mobile learning, technology-enabled learning, and the increasingly popular micro-certificate trend. The influence of potential and other aspects. In the past few decades, one of the most important changes in the discussion on teaching and learning has shifted from focussing on teaching to learning-centered, seeing learners as collaborators and producers and consumers.

The ubiquitous and increasingly powerful functions of mobile technology promote and facilitate the development of learning methods, especially where educational resources are scarce. The development of distance open education involves stakeholders at the regional, national and international levels, including learners, teachers, departments and institutions. Therefore, it is necessary to reform policy formulation, quality assurance, certificate issuance, verification and certification, and assessment system to meet the needs of all parties. UNESCO's 2030 Sustainable Development Goals for Education focusses on global learning, lifelong learning and all-round learning. According to this goal, anyone should be able to receive education anytime and anywhere through any device, and learners will take the initiative to plan their own various learning processes and methods and choose their own learning journey. Learners will take the initiative to plan their own learning process and methods and choose their own learning journey. These goals are aimed at providing and ensuring inclusive, fair and high-quality education, which will be realised by providing opportunities, practicing democracy, ensuring affordability, improving efficiency and embodying equality. It can be seen that we must rethink the leadership and management style at all levels to ensure that the digital transformation process that promotes learners to control their own learning is adaptive and open. We must also rethink our leadership at all levels in the field of education. Implement a modern management system to make the leadership and management team full of vitality and initiative. As a professional way of talent training, art education should follow the characteristics of different art majors and emphasize teaching according to aptitude because of its talent quality, way of thinking, living environment and other aspects. The development of digital technology will inevitably bring an impact on traditional art language and art disciplines. Therefore, we must clarify the relationship between traditional art disciplines and new disciplines, and avoid simply copying the views of evolution theory, and judging each other's superior understanding by the old and the new. In the traditional art education model, music, art, drama, opera, dance and other traditional arts pay attention to the technical training of the major itself, such as Chinese painting, oil painting and other traditional art majors. Students insist on learning the basic skills of painting, and the brush in their hands is the most important tool. With the advent of the digital age at any time, art education should further enrich teaching methods and actively explore the auxiliary role of digital technology in the education process. Base on this, It is hope that

through the research of the above topics in this research and the analysis of scientific research methods exploring the effectiveness of online art education and digital leadership in Beijing. Delves into the components contributing to the effectiveness of online art education and identifies the key digital leadership factors influencing its success in Beijing. Furthermore, it aims to establish managerial guidelines aimed at enhancing the effectiveness of online art education in the city, emphasizing the pivotal role of digital leadership in this educational domain.

The research background highlights the rapid advancement of science and technology, particularly under the Fourth Industrial Revolution, which has significantly influenced education. This era is characterized by globalization and digitalization, with mobile learning becoming increasingly prevalent due to the widespread use of mobile devices. UNESCO's 2030 Sustainable Development Goals stress the importance of inclusive, fair, and high-quality education accessible to all, anytime and anywhere, facilitated by digital technology.

The shift from a teaching-centered to a learner-centered approach emphasizes learners as active participants in their education. This transformation necessitates policy reforms, quality assurance, certification processes, and assessment systems to cater to various stakeholders, including learners, teachers, and institutions at multiple levels. Art education, with its unique characteristics, must adapt to the digital age by integrating digital technology to enrich traditional teaching methods. The research aims to explore the effectiveness of online art education and digital leadership in Beijing, identifying key components and managerial guidelines to enhance this educational domain. This underscores the crucial role of digital leadership in fostering an adaptive, inclusive, and innovative educational environment.

Base on this, It is hope that through the research of the above topics in this research and the analysis of scientific research methods exploring the effectiveness of online art education and digital leadership in Beijing. Delves into the components contributing to the effectiveness of online art education and identifies the key digital leadership factors influencing its success in Beijing. Furthermore, it aims to establish managerial guidelines aimed at enhancing the effectiveness of online art education in the city, emphasizing the pivotal role of digital leadership in this educational domain.This paper is being presented to address the evolving landscape of education in the digital era, characterized by rapid advancements in science and technology, the widespread adoption of mobile learning, and the transformative impact of the Fourth Industrial Revolution. The research focuses on the realm of art education in Beijing, aiming to delve into the components that contribute to the effectiveness of online art education and to identify the key digital leadership factors that influence its success.

By exploring the effectiveness of online art education, this research seeks to bridge the gap between traditional art education practices and the opportunities presented by digital technologies. The integration of digital tools and methodologies into art education can enhance learning outcomes, accessibility, and engagement, particularly in a world where mobile devices have become ubiquitous and educational resources may be limited.Furthermore, by identifying key digital leadership factors, this study aims to illuminate the critical role that leadership plays in driving the successful implementation of online art education initiatives. Effective digital leadership is essential for navigating the complexities of digital transformation, fostering innovation, and creating a supportive environment for educators and learners to thrive in the digital age. In addition, the establishment of managerial

guidelines is crucial for guiding educational leaders in effectively leveraging digital technologies to enhance the quality and inclusivity of online art education. By providing practical recommendations and strategies, this research aims to empower educational institutions and policymakers to adapt to the changing educational landscape, align with UNESCO's 2030 Sustainable Development Goals for Education, and ensure that education remains accessible, engaging, and relevant for learners in Beijing and beyond.

In conclusion, this research paper seeks to contribute to the ongoing dialogue on the intersection of digital technology, art education, and leadership, with the overarching goal of promoting inclusive, fair, and high-quality education that empowers learners to take control of their learning journey in the digital age.

Research Objectives

(1) To study the components of the effectiveness of digital leadership in online art education in Beijing.

(2) Propose Structural Equation Modeling (SEM) of factors effecting effectiveness of online art education in Beijing.

(3) To investigate the factors influencing for improving the effectiveness of online art education in Beijing.

Literature Review

Digital leadership combines mindset, behaviors, and skills to enhance school culture through technology. Leaders across sectors embrace change, transparency, collaboration, sharing, global dialogue, and community building. They leverage digital tools to support traditional leadership roles while initiating transformative change, a practice still prevalent today. Key goals include increasing student engagement, improving learning outcomes, enhancing economic viability, closing the digital divide, making academics relevant, and building 21st-century skills (Lemke, Coughlin, & Reifsneider, 2009).

Notable theories and frameworks in digital leadership include:

1) Digital Leadership Model:Combines strategic thinking, digital capabilities, and leadership behaviors.

2) Digital Transformation Leadership Theory:Focuses on driving digital transformation and creating a culture of innovation.

3) Digital Mindset Theory:Encourages continuous learning and a growth-oriented approach to digital technologies.

4) Digital Leadership Capabilities Framework:Highlights skills like digital literacy and data analytics.

5) Digital Ecosystem Leadership Theory:Emphasizes navigating digital ecosystems and building partnerships.

6) Network Leadership Theory:Leverages networks and relationships beyond hierarchical structures.

7)Technological Leadership Theory:Focuses on driving technology adoption and fostering innovation.

Research Hypotheses

H1: Digital Technology literacy has statistically significant directly influences the effectiveness of digital leadership in online art education in Beijing .

H2: Leadership and Organizational Structure has statistically significant directly influences the effectiveness of digital leadership in online art education in Beijing .

H3: Thinking and Performance Expectations has statistically significant directly influences the effectiveness of digital leadership in online art education in Beijing .

H4:Digital Competencies and Organizational Culture has statistically significant directly influences the effectiveness of digital leadership in online art education in Beijing .

H5:Transparency, Adaptation, and Feedback has statistically significant directly influences the effectiveness of digital leadership in online art education in Beijing .

Research Method

1. Research Design

The research method adopts a mixed research method, including quantitative and qualitative research methods. The population were teachers and staffs of educational institution in Beijing. The total number were 1482 persons, and the respondent used for the study were 310.The key informants for semi-structure interviews were 5 experts.The instruments used foe data collection were data record form; semi structured interview form and five-point rating scale questionnaire.Questionnaires have been received at the response rate of 100%. by G*Power software in order to fit the research methodology by using CFA and SEM statistics.

2. Population and Sample

The total number were 1482 persons, and the respondent used for the study were 310.The key informants for semi-structure interviews were 5 experts. The purposive sampling research papers is used to select in this part total 22 documents, Conducted in-depth interviews with educational experts special from China totally 5 experts with more than5 years of work experience.

3. Research Instruments

The instruments to collect data consist of 2 parts: First to collect data record note and form from documents related. Second, after the researcher makes content analysis from review literature will request the interview from 5 educational administration experts. Use the semi-structured interview form (SSI). Individual interview will be done by Face-to-face and Online interview.Research instruments was questionnaire which was 5 points rating skill. It is consisted of 3 parts, part 1 was about basic information of the responsedant. part 2 the question about digital leadership factors affecting organization effectiveness.part 3 were the open end questions, selected the items that make good IOC to complete questionnaire , choose reliability 310 people from the population 1482, but not the same people in the sample. Then go to try out IOC..The instruments used foe data collection were data record form; semi structured interview form and five-point rating scale questionnaire.Questionnaires have been received at the response rate of 100%. by G*Power software in order to fit the research methodology by using CFA. and SEM statistics.

4. Data Analysis

(1) Descriptive statistic to describe the variables using frequency, percentage, arithmetic mean, standard deviation, skewness, and kurtosis, and the criteria was used to interpret the mean score were: (John W. Best, 1997: 190)

1.00 – 1.49	Very low	1.50 – 2.49	Low
2.50 – 3.49	Moderate	3.50 – 4.49	High
4.50 – 5.00	Very high		

(2) Correlation analysis between independent variables to study the relationship among variables for multicollinearity check, in this event the Pearson Correlation coefficient not more than 0.90 (Hair, et.al.,2010).

(3) Composite Reliability (CR), and Average Variance Extraction (AVE) used to check the convergent validity of CFA measurement model. In this context the CR. Must be have 0.7 and more, and AVE must be 0.5 and more (Fornell and Larcker, 1981; Hair, et.al.,2010)

(4) Data analysis in order to hypotheses testing, The MIMIC analysis was used, the values used to check the harmonization and coherence of the structural equation model with the empirical data included. By looking at the value of factor loading (b and β), Standard arrow, Z-test, p-value and R-square. And the fit index for model fit with empirical data.

(5) This phase design by using the qualitative method to collect data from the perception of educational experts in order to filter the factors influencing for improving the effectiveness of online art education in Beijing.

Research Results

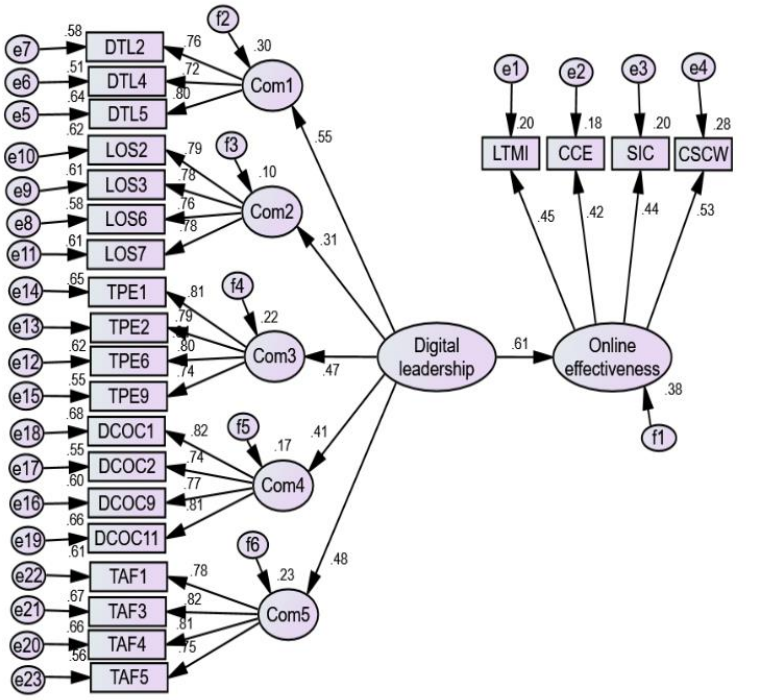
According to the research objectives (1)To study the components of the effectiveness of digital leadership in online art education in Beijing.(2)Propose Structural Equation Modeling (SEM) of factors effecting effectiveness of online art education in Beijing. (3) To investigate the factors influencing for improving the effectiveness of online art education in Beijing.The results of this research were found that (1) there were 5 factors influencing the effectiveness of digital leadership in online art education in Beijing. The most important were Digital Technology Literacy, (2) The Structural Equation Modeling (SEM) of factors influencing the effectiveness of digital leadership in online art education in Beijing was fit with the empirical data by the value of Relative Chi-square = 216.091, Relative Chi-square = 0.965, GFI = 0.941, AGFI = 0.928, TLI = 1.003, RMR = 0.068, and RMSEA = 0.000. These indices suggest that the model fits the data well, supporting the specified relationships.(3) There was only one factor, Digital Technology Literacy has statistical significant directly influences the effectiveness of digital leadership in online art education in Beijing.

Table 1 The results of data analysis from the index used to examine the consistency and harmony of the variables with the empirical data.

Value	Criteria index	Value from analyzed	Result
x^2/df	2.00 <x^2/df≤ 3.00	0.858	Accept
GFI	0.90<GFI≤ 1.00	0.960	Very good
AGFI	0.90≤AGFI≤ 1.00	0.947	Very good
CFI	0.95≤CFI≤1.00	0.960	Very good
TLI	0,90≤TLI≤1.00	1.010	Very good

RMR	0.00≤RMR≤0.08	0.051	Very good
RMSEA	0.00≤RMSEA≤0.08	0.000	Accept

Figure 1 Show the construct of SEM analysis result of factors influencing effectiveness of digital leadership in online art educational in Beijing.



The figure shows a structural equation model (SEM) developed using AMOS, illustrating the relationships between latent constructs related to "Digital Leadership" and "Online Effectiveness." The model includes five latent constructs (Com1 to Com5) with their respective observed variables and error terms. Com1 is linked to DTL2, DTL4, and DTL5, with factor loadings of 0.76, 0.72, and 0.80 respectively. Com2 connects to LOS2, LOS3, LOS6, and LOS7, with loadings ranging from 0.76 to 0.79. COM3 includes TPE1, TPE2, TPE6, and TPE9, with loadings from 0.74 to 0.81. COM4 is associated with DCOC1, DCOC2, DCOC9, and DCOC11, with loadings from 0.74 to 0.82. COM5 links to TAF1, TAF3, TAF4, and TAF5, with loadings from 0.75 to 0.82. The higher-order construct "Digital Leadership" is influenced by Com1 to Com5 with respective loadings of 0.30, 0.10, 0.22, 0.17, and 0.23. Digital Leadership also has a direct effect on "Online Effectiveness" with a loading of 0.61. "Online Effectiveness" is influenced by Digital Leadership and four observed variables: LTMI (0.45), CCE (0.42), SIC (0.44), and CSCW (0.53). Fit indices at the bottom of the figure

indicate the model's goodness-of-fit: Chi-square = 216.091, Relative Chi-square = 0.965, GFI = 0.941, AGFI = 0.928, TLI = 1.003, RMR = 0.068, and RMSEA = 0.000. These indices suggest that the model fits the data well, supporting the specified relationships.

Table 2 Show statistical value of the factors

			Estimate	S.E.	C.R.	P	Label
Online_effectiveness	<---	Com1	.173	.051	3.398	***	
Online_effectiveness	<---	Com2	-.004	.042	-.090	.928	
Online_effectiveness	<---	Com3	.144	.045	3.165	.002	
Online_effectiveness	<---	Com4	.013	.041	.319	.750	
Online_effectiveness	<---	Com5	.026	.042	.620	.536	
overallY1	<---	Online_effectiveness	.826	.186	4.447	***	
overallY2	<---	Online_effectiveness	.804	.186	4.318	***	
overallY3	<---	Online_effectiveness	.849	.191	4.446	***	
overallY4	<---	Online_effectiveness	1.000				

Discussion

Discussion about major findings of objective 1

There were 5 components that of digital Leadership required by online art education instruction in Beijing which consisted of:

1.Digital Technology literacy

2.Leadership and Organizational Structure

3.Thinking and Performance Expectations

4.Digital Competencies and Organizational Culture

5.Transparency, Adaptation, and Feedback

The highlighted studies collectively underscore the critical facets of digital leadership within the context of online art education in Beijing, touching on digital transformation,

communication evolution, cultural shifts, and strategic adaptation. Key insights include the necessity for a transformative vision and robust leadership to guide the digital transformation process, as elucidated by Fang, Y. (2019) and Zhu Zhiting, Hu Jiao, (2022). The importance of effective communication and collaboration, as discussed by Xiao Junhong (2018), aligns with the evolving demands for interactive and responsive educational environments. Moreover, the works of Liu Mian, Lin Maosen, (2020), and Wang Jingying, Zhou Danhua (2022) highlight the need for educational leaders to navigate cultural and structural changes within workplaces, advocating for a shift towards personalized, intelligent education systems. This body of research suggests that operational and strategic adaptations are crucial for integrating digital technologies effectively into educational practices, aiming to enhance the learning and teaching experience in a rapidly evolving digital landscape.

Discussion about major findings of objective 2

Objective 2 to study the factors of digital leadership affecting teacher work effectiveness of online art education in Beijing The major findings of this objective can be discussed as follows:

The distinction between organizational and technical leadership reveals that successful digital transformation requires both strategic organizational leadership and expertise in technical guidance and data governance. This dual-track leadership helps ensure alignment between technology and educational objectives.The importance of professional development and training is repeatedly emphasized, indicating that educators need to continuously improve their digital learning abilities to adapt to rapidly changing technological environments.The role of community and collaboration is seen as a key factor in the successful implementation of digital strategies, requiring educational institutions to cultivate a culture of cooperation and engage in effective communication and collaboration.The effectiveness of planning and evaluation is critical for ensuring the successful implementation of digital plans, involving the establishment of information systems, the construction of an information environment, and the creation of evaluation mechanisms.

Discussion about major findings of objective 3

The research associated with Objective 3 to the guidelines for improving the digital leadership of online art education in Beijing . Through detailed data analysis and research, several effective tactics and practices have been identified that can bolster the capabilities of leader to guide digital realms in educational settings.

In summary, Objective 3's findings propose guidelines for enhancing the digital leadership of online art education administrators in Beijing. These guidelines encompass the creation of comprehensive strategies, provision of specialized training programs, integration of digital leadership in performance assessments, and the promotion of a digitally engaging culture. By adhering to these recommendations, can fortify their digital leadership capabilities, thereby contributing significantly to the advancement of online art education institutions. These actionable insights offer practical advice for educational entities aiming to

amplify their administrative digital leadership prowess and utilize digital technologies for improved educational achievements.

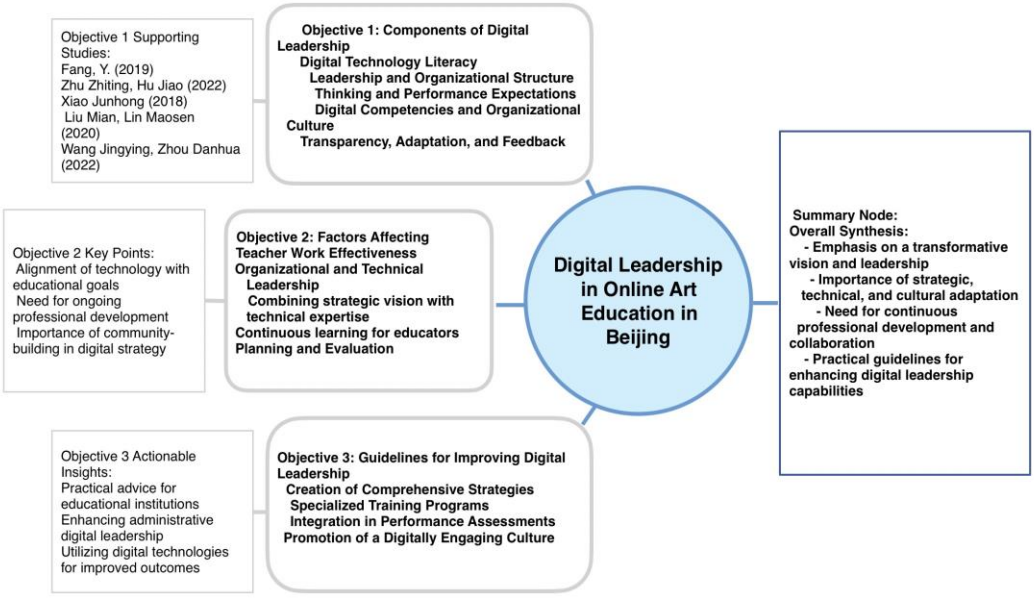


Figure 2 Show the overall findings from the discussion on digital leadership in online art education in Beijing involves organizing the major points into a visual structure

Recommendations

In the ongoing development of digital technology and its integration into the education system, especially in online arts education institutions in Beijing, there is a growing need to deepen our understanding of digital leadership and its multi-faceted implications. Future research should aim to create an overall picture covering several interrelated areas without necessarily dividing them into discrete topics.

Exploring the dynamics of digital leadership requires a holistic approach that considers cultural, technical, ethical, and pedagogical dimensions simultaneously. For example, understanding how digital leadership practices vary from culture to culture and the impact of these changes on educational outcomes can provide valuable insights into creating more effective and culturally sensitive leadership strategies. Similarly, studying the integration of emerging technologies such as artificial intelligence and virtual reality in arts education requires an understanding of the technical and leadership challenges involved in such efforts.

Empowering teachers through digital leadership is another key area of focus. This involves not only providing access to digital tools and platforms, but also fostering an environment that supports continued professional development, innovation in teaching practices, and a culture that values collaboration and ethical considerations when using digital data. In addition, the shift to online and blended learning models brought about by global events such as the COVID-19 pandemic highlights the need for in-depth research into how

digital leadership fits into and thrives within these new educational paradigms. This includes understanding the impact of such models on student engagement, institutional culture, and the scalability of digital initiatives across departments and projects. Furthermore, the ethical dimensions of digital leadership, including issues related to data privacy, security and the digital divide, need to be thoroughly investigated. These concerns are critical to ensuring that digital technologies are adopted in education in ways that are not only effective but also responsible and inclusive. Finally, the potential of public-private partnerships in advancing digital education initiatives is an area ripe for exploration. Such collaborations can facilitate the sharing of resources, expertise, and innovative practices, but they also raise questions about the impact of equity in education and the role of educational institutions in this changing digital landscape.

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