

Digital Learning Innovations for Social Sciences and History Education in Primary Schools

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ABSTRACT

The Digital learning innovations have significantly transformed contemporary educational practices by introducing new methods of knowledge acquisition, interaction, and assessment. In primary school social sciences and history education, digital technologies provide opportunities to overcome traditional limitations associated with abstract concepts, limited learning resources, and passive knowledge transmission. This research paper examines the role of digital learning innovations in improving social sciences and history education through an analytical review of technological applications, pedagogical frameworks, and implementation challenges. The study investigates how digital platforms, smart electronic systems, Internet of Things (IoT)-enabled environments, artificial intelligence-supported tools, and interactive learning resources contribute to meaningful learning experiences among young learners.

The research adopts a qualitative analytical methodology based exclusively on the provided scholarly literature. The study synthesizes perspectives on digital transformation, educational technologies, digital competencies, innovation readiness, and higher-order thinking development. Digital technologies in education have expanded learning possibilities by enabling personalized instruction, collaborative learning environments, multimedia-based historical exploration, and improved accessibility of educational resources (Haleem et al., 2022). Similarly, the evolution of smart electronic systems and connected technologies demonstrates the increasing capacity of digital infrastructures to support intelligent and adaptive educational environments (Sassone et al., 2019).

The findings reveal that digital learning innovations contribute to primary social sciences and history education through five major mechanisms: enhanced visualization of historical events, increased learner engagement, development of critical thinking skills, improved collaboration, and access to diverse knowledge resources. Interactive timelines, digital archives, virtual exhibitions, geographical information systems, and educational simulations allow students to examine historical processes beyond conventional textbook-based approaches. Furthermore, digital learning environments support the development of twenty-first-century competencies, including information literacy,

problem-solving, communication, and technological adaptability (van Laar et al., 2020).

However, the analysis also identifies significant challenges, including unequal access to technology, insufficient teacher digital competence, cybersecurity concerns, and the risk of excessive dependence on digital platforms. Effective implementation requires institutional readiness, appropriate teacher training, and alignment between technological tools and educational objectives. The research concludes that digital innovations should not replace traditional teaching approaches but should function as complementary systems that strengthen inquiry-based learning and historical understanding.

This study contributes to discussions on technology-enhanced humanities education by presenting a conceptual framework for integrating digital innovations into primary social sciences and history classrooms. It emphasizes that successful digital transformation depends on balancing technological capability with pedagogical purpose, ensuring that technology serves meaningful educational development rather than becoming an isolated technical intervention.

Keywords: learning innovations; Primary education; Social sciences education; History teaching; Educational technology; Digital literacy; Smart learning systems; Higher-order thinking skills;

1. INTRODUCTION

Social sciences and history education in primary schools serve as essential foundations for developing students' understanding of society, culture, human development, and collective experiences. These subjects introduce young learners to concepts such as historical change, social relationships, citizenship, cultural diversity, and technological progress. However, teaching these areas has traditionally relied heavily on textbooks, lectures, and memorization-based approaches. Such methods may limit students' ability to visualize historical contexts, connect past events with contemporary realities, and develop analytical interpretations of social phenomena.

The emergence of digital learning innovations has created new possibilities for transforming primary education. Digital technologies have changed the structure of learning environments by introducing interactive platforms, multimedia resources, intelligent systems, and collaborative tools. In social sciences and history education, these innovations enable students to explore historical events through digital archives, interactive maps, virtual environments, and visual representations. Instead of receiving historical information passively, learners can engage with evidence, compare perspectives, and construct knowledge through exploration.

Digital transformation in education is closely connected with broader technological developments. The expansion of digital technologies has influenced how information is produced, accessed, and communicated. Haleem et al. (2022) emphasize that digital technologies have become

important components of modern educational systems by supporting flexible learning models, improving accessibility, and enhancing educational efficiency. These developments indicate that technology is no longer only a supportive tool but an important factor influencing educational structures and learning processes.

The increasing development of smart electronic systems further strengthens opportunities for innovative learning environments. Smart technologies integrate computing capabilities, connectivity, and intelligent functions to create responsive systems. Sassone et al. (2019) highlight the importance of smart electronic systems in modern technological ecosystems, demonstrating how intelligent devices can support complex human activities. Within education, similar technologies can contribute to adaptive learning experiences where digital resources respond to learners' needs.

Despite these opportunities, the integration of digital innovations into primary social sciences and history education remains a complex challenge. Technology availability does not automatically guarantee educational improvement. Successful implementation depends on teachers' digital competencies, institutional preparedness, curriculum alignment, and students' ability to use digital resources effectively. Research on digital skills demonstrates that technological competence involves multiple dimensions, including information management, communication, problem-solving, and responsible technology use (van Laar et al., 2020).

The problem addressed in this research is the need to understand how digital learning innovations can be effectively integrated into primary social sciences and history education while maintaining educational quality and meaningful learning outcomes. Although digital technologies offer significant advantages, questions remain regarding appropriate pedagogical models, implementation strategies, and limitations.

The primary objective of this study is to analyze the role of digital learning innovations in enhancing social sciences and history education in primary schools. Specifically, the research aims to examine technological applications, identify educational benefits, evaluate implementation challenges, and develop a conceptual understanding of effective digital integration.

The significance of this research lies in its contribution to discussions about technology-supported humanities education. While digital transformation is often associated with scientific and technical disciplines, social sciences and history education can also benefit significantly from innovative digital approaches. By integrating technology with inquiry-based teaching methods, primary schools can support the development of historically aware, digitally competent, and critically thinking learners.

The scope of this study focuses on digital learning innovations applicable to primary social sciences and history classrooms. It examines digital platforms, smart systems, connected technologies, and competency-based learning approaches using the provided literature as the theoretical foundation. The research positions digital innovation as a pedagogical transformation process that requires both technological capability and educational vision.

2. LITERATURE REVIEW

The literature on digital learning innovations demonstrates that technological advancement has become increasingly connected with educational transformation, competency development, and intelligent learning environments. The provided studies collectively establish a theoretical foundation for understanding how digital systems influence teaching and learning practices, particularly through accessibility, connectivity, personalization, and cognitive development.

Haleem et al. (2022) provide an extensive examination of digital technologies in education and highlight their role in improving learning accessibility, operational efficiency, and instructional flexibility. Their analysis positions digital technology as a mechanism for expanding educational opportunities through online platforms, digital content, and technology-supported teaching models. In the context of primary social sciences and history education, these

ideas suggest that digital resources can overcome limitations of conventional teaching by providing students with visual, interactive, and diverse representations of historical knowledge.

The development of smart electronic systems represents another important dimension of digital learning innovation. Sassone et al. (2019) explain that smart electronic systems combine sensing, processing, and communication capabilities to create intelligent technological environments. Applied to education, such systems can support interactive classrooms through smart boards, connected devices, adaptive learning platforms, and automated feedback mechanisms. These technologies create possibilities for more responsive learning experiences where educational content can be adjusted according to learners' requirements.

The literature on Internet of Things (IoT) further expands understanding of connected educational environments. Ali Laghari et al. (2022) discuss IoT as a technological framework involving interconnected devices capable of exchanging information. Although their study focuses broadly on IoT development, its implications for education include the possibility of creating connected classrooms where digital resources, learning devices, and educational management systems operate together. In social sciences and history classrooms, IoT-enabled environments could support location-based learning activities, digital exhibitions, and interactive historical simulations.

Digital competency development is another significant theme within the literature. Van Laar et al. (2020) emphasize that twenty-first-century digital skills involve more than technical operation of devices. They include information processing, communication, creativity, problem-solving, and critical evaluation. This perspective is highly relevant for primary history education because students must learn not only to access digital historical resources but also to interpret and evaluate information critically.

The importance of institutional readiness for digital transformation is examined by Sony and Naik (2020), who identify essential factors influencing technology adoption and organizational preparedness. Their framework suggests that successful implementation depends on infrastructure, leadership support, human capabilities, and strategic planning. In educational contexts, this indicates that digital innovation requires systematic planning rather than simply introducing technological devices into classrooms.

Ghobakhloo (2020) connects digitization with broader sustainability and transformation processes, highlighting how digital technologies reshape organizational activities and resource management. This perspective supports the argument that digital learning innovations should be

implemented sustainably by considering long-term educational goals, resource efficiency, and accessibility.

The relationship between digital innovation and higher-order thinking development is explored by Kwangmuang et al. (2021), who examine learning innovations designed to enhance students' analytical abilities. Their findings support the use of technology-supported learning approaches that encourage problem-solving, creativity, and deeper cognitive engagement. These principles are particularly valuable for history and social sciences because these subjects require interpretation, comparison, and reasoning rather than simple memorization.

Wong (2020) contributes to the discussion by examining competency development and assessment. The study highlights the importance of defining and measuring competencies effectively. In digital history and social science education, assessment approaches must evaluate students' ability to analyze information, communicate ideas, and apply knowledge rather than only recall facts.

The remaining provided studies focusing on social, cultural, and educational phenomena contribute contextual perspectives regarding human behavior, knowledge transfer, and contemporary learning environments. Carter et al. (2025), Kaluba et al. (2025), Reynolds and El-Sayed (2025), Guessan et al. (2025), and Pang et al. (2025) provide discussions related to social structures, knowledge practices, learning processes, and emerging educational applications. Particularly, research on large language models in education highlights the increasing role of artificial intelligence-supported learning environments (Pang et al., 2025).

Despite extensive discussion of digital technologies, a research gap remains regarding their specific application in primary social sciences and history education. Existing literature provides strong theoretical explanations of digital transformation, competency development, and technology adoption, but limited attention has been given to integrating these innovations with historical thinking and social understanding among young learners. This study addresses this gap by developing an analytical framework connecting digital technologies with primary-level humanities education.

3. METHODOLOGY

This research adopts a qualitative review-based methodology to analyze digital learning innovations in primary social sciences and history education. The approach is based exclusively on conceptual synthesis of the provided references. The methodology focuses on identifying technological functions, educational applications, competency requirements, and implementation challenges associated with digital

transformation in learning environments.

The research framework consists of four analytical dimensions: technological infrastructure, pedagogical integration, learner competency development, and educational sustainability.

The first dimension, technological infrastructure, examines the digital systems that enable innovative learning experiences. These include smart electronic systems, IoT-based environments, digital platforms, artificial intelligence applications, and multimedia learning resources. Smart technologies provide the foundation for interactive educational environments by enabling communication between devices, users, and digital content. Sassone et al. (2019) explain that smart systems combine computational intelligence and connectivity, characteristics that can support modern classroom environments.

In primary social sciences and history classrooms, technological infrastructure can include interactive digital maps, virtual historical tours, online archives, educational applications, and collaborative platforms. For example, students studying ancient civilizations can explore digital geographical models, examine historical images, and interact with multimedia timelines rather than relying exclusively on printed materials.

The second dimension, pedagogical integration, examines how teachers transform digital tools into meaningful learning experiences. Technology must be connected with instructional objectives and curriculum requirements. A digital history lesson should not simply replace a textbook with a screen-based resource; instead, it should encourage investigation, comparison, and interpretation.

The methodology identifies inquiry-based digital learning as an effective approach. In this model, students engage with digital resources to answer historical questions. For example, learners may analyze photographs, documents, and maps from different historical periods to understand social changes. Such activities promote deeper understanding and align with research emphasizing technology-supported higher-order thinking development (Kwangmuang et al., 2021).

The third dimension, learner competency development, focuses on the skills required for effective participation in digital learning environments. Students require information literacy, critical thinking, communication skills, and responsible technology practices. Van Laar et al. (2020) demonstrate that digital competencies involve multiple cognitive and social abilities beyond basic device operation.

The fourth dimension, educational sustainability, considers long-term implementation requirements. Sustainable digital education requires infrastructure investment, teacher training, institutional support, and

equitable access. Sony and Naik (2020) emphasize that successful technology adoption depends on organizational readiness and strategic implementation.

The proposed Digital Innovation Framework for Primary Social Sciences and History Education includes:

Digital Resource Layer:

Provides access to historical databases, multimedia materials, simulations, and interactive learning resources.

Technology Integration Layer:

Connects digital tools with classroom activities through smart devices, AI-supported systems, and collaborative platforms.

Cognitive Development Layer:

Encourages analysis, evaluation, creativity, and problem-solving through technology-supported inquiry.

Assessment Layer:

Measures digital competencies, historical understanding, and students' ability to apply knowledge.

This framework recognizes that digital innovation is a combination of technology, pedagogy, and human capability. Effective implementation requires balancing technological opportunities with educational principles.

4. RESULTS / FINDINGS

The analysis of digital learning innovations in primary social sciences and history education reveals several significant patterns regarding the role of technology in improving educational experiences. The findings indicate that digital transformation influences not only the availability of learning resources but also the methods through which students understand, interpret, and engage with historical and social knowledge.

The first major finding is that digital technologies improve the visualization and accessibility of complex social science and historical concepts. Primary-level students often experience difficulties understanding abstract ideas such as historical timelines, cultural transformations, political developments, and social relationships. Digital tools provide multimedia representations through images, animations, interactive maps, and simulations, allowing students to construct clearer conceptual connections. Digital technologies in education have expanded opportunities for flexible and resource-rich learning environments by improving access to diverse educational materials (Haleem et al., 2022).

The second finding demonstrates that digital innovations support active and inquiry-based learning. Traditional history education frequently emphasizes information retention, whereas digital environments encourage exploration and interpretation. Students can examine digital archives, compare historical sources, participate in virtual activities, and create multimedia presentations.

Such practices encourage higher-order thinking skills, including analysis, evaluation, and problem-solving. Kwangmuang et al. (2021) emphasize that innovative learning approaches can enhance students' cognitive abilities by encouraging deeper engagement with learning activities.

The third finding relates to the development of digital competencies among primary learners. Digital learning environments require students to develop abilities beyond basic technology operation. They must evaluate information reliability, communicate effectively through digital platforms, and use technological resources responsibly. The development of these competencies supports broader twenty-first-century learning objectives. Van Laar et al. (2020) identify digital skills as multidimensional capabilities involving information management, creativity, communication, and critical thinking.

The fourth finding highlights the importance of teacher readiness and institutional support. Technology integration is most effective when teachers possess adequate digital knowledge and pedagogical skills. Simply providing devices without professional development may result in limited educational benefits. The literature on organizational technology readiness indicates that successful adoption depends on infrastructure, leadership, human resources, and strategic planning (Sony & Naik, 2020). This principle applies directly to educational institutions implementing digital learning initiatives.

Another important finding concerns the contribution of smart and connected systems to future classrooms. Smart electronic systems and IoT-based technologies create possibilities for interactive and adaptive educational environments. Connected devices can support personalized learning experiences, automated feedback, and collaborative activities. Sassone et al. (2019) demonstrate that smart systems integrate sensing, processing, and communication capabilities, which can contribute to more intelligent learning ecosystems.

However, the analysis identifies several limitations. The first challenge is unequal access to digital infrastructure. Differences in device availability, internet connectivity, and institutional resources may create educational inequalities. The second challenge involves digital dependency. Excessive reliance on technology may reduce opportunities for direct discussion, social interaction, and reflective learning. The third challenge concerns information quality and digital safety. Students require guidance to evaluate online information and use digital resources responsibly.

The findings also indicate that digital learning innovations should complement rather than replace traditional teaching approaches. Historical understanding requires

interpretation, discussion, and human interaction. Technology can enhance these processes by providing additional resources and learning opportunities but cannot independently create meaningful educational experiences.

Overall, the results suggest that digital learning innovations have considerable potential to transform primary social sciences and history education. Their effectiveness depends on purposeful implementation, teacher competence, institutional preparedness, and alignment between technological tools and educational objectives.

5. DISCUSSION

The findings of this research demonstrate that digital learning innovations represent a significant shift in the teaching and learning of social sciences and history at the primary level. The transformation extends beyond introducing digital devices into classrooms; it involves changing how knowledge is accessed, interpreted, and constructed. Digital technologies create opportunities for students to move from passive information receivers toward active participants in historical inquiry and social understanding.

A central theoretical implication of this study is that digital innovation should be viewed as a socio-technical educational process. Technology does not function independently from human practices, institutional structures, and pedagogical decisions. Ghobakhloo (2020) explains that digitization creates broader transformation opportunities when organizations strategically integrate technology into their processes. Similarly, educational institutions must approach digital learning as a planned transformation rather than a simple equipment acquisition process.

The integration of digital technologies into history education creates important pedagogical advantages. Interactive resources allow students to explore historical events through multiple perspectives, encouraging critical interpretation rather than memorization. For example, a primary classroom studying local history can combine digital maps, photographs, recorded narratives, and online archives to understand community development. This approach strengthens connections between historical knowledge and students' personal environments.

However, the discussion also reveals important tensions. While digital resources increase access to information, they also create challenges related to information overload and reliability. Young learners may encounter difficulties distinguishing accurate historical information from misleading digital content. Therefore, digital history education must include critical evaluation skills. Wong

(2020) emphasizes the importance of competency development and assessment, suggesting that educational success depends on clearly defined abilities rather than simple technology usage.

Another important implication concerns artificial intelligence and emerging digital systems. The increasing use of advanced technologies, including large language models, introduces new possibilities for personalized learning and educational support. Pang et al. (2025) highlight the growing relevance of AI-supported educational practices. In primary social sciences and history education, AI tools could assist with generating explanations, supporting inquiry activities, and adapting learning materials. However, careful supervision is required to maintain accuracy, ethical use, and learner independence.

The findings also emphasize the importance of teacher preparation. Teachers remain central to effective digital transformation because they determine how technology is integrated into classroom practices. Professional development programs should focus not only on technical skills but also on digital pedagogy, resource evaluation, and technology-supported assessment.

From an institutional perspective, digital transformation requires sustainable planning. Schools must consider infrastructure maintenance, cybersecurity, accessibility, and long-term resource management. The principles of technology readiness identified by Sony and Naik (2020) suggest that successful implementation requires alignment between organizational capacity and technological goals.

The limitations of digital learning innovations should also be recognized. Technology cannot completely replace traditional historical learning methods involving discussion, interpretation, and social interaction. Additionally, differences in digital access may increase educational inequalities if implementation strategies do not address resource disparities.

Despite these challenges, digital innovations provide valuable opportunities for improving primary social sciences and history education. When combined with effective teaching strategies, digital tools can enhance historical awareness, analytical thinking, collaboration, and digital competence. The future of digital education depends on achieving balance between technological possibilities and human-centered pedagogy.

6. CONCLUSION

Digital learning innovations have emerged as influential forces in reshaping primary education, particularly in the teaching of social sciences and history. This research examined the role of digital technologies in improving learning experiences, developing student competencies,

and supporting innovative pedagogical practices. The analysis demonstrates that digital transformation provides significant opportunities for making history and social sciences more interactive, accessible, and meaningful for young learners.

The study establishes that digital technologies enhance primary education by expanding access to diverse learning resources and enabling new forms of knowledge representation. Through interactive applications, digital archives, virtual environments, multimedia content, and connected learning systems, students can explore historical events and social concepts in ways that extend beyond conventional classroom limitations. These innovations support visualization, contextual understanding, and active participation, which are essential for developing meaningful historical awareness.

A major contribution of this research is the identification of digital learning as a combination of technological infrastructure, pedagogical practice, and competency development. Digital devices alone cannot transform education; their effectiveness depends on how teachers integrate them into curriculum objectives and learning activities. The role of teachers remains central because they guide students in interpreting digital information, evaluating sources, and developing critical perspectives.

The research also highlights that digital innovations support the development of twenty-first-century competencies. Primary students increasingly require skills related to information management, communication, creativity, collaboration, and responsible technology use. These competencies prepare learners not only for academic success but also for participation in digitally connected societies. As emphasized in research on digital skills, technological capability involves cognitive and social abilities rather than only operational knowledge (van Laar et al., 2020).

However, successful digital transformation requires addressing several challenges. Unequal access to technology, limited teacher training, infrastructure constraints, and concerns regarding digital safety remain significant barriers. Educational institutions must adopt strategic approaches that ensure equitable access and sustainable technology implementation. Digital innovation should therefore be considered a long-term educational development process rather than a short-term technological intervention.

Future research should examine digital learning innovations through empirical classroom studies, focusing on student achievement, teacher experiences, and long-term learning outcomes. Further investigation is also required into the responsible application of artificial intelligence, smart systems, and connected technologies in primary humanities education.

In conclusion, digital learning innovations represent valuable opportunities for strengthening social sciences and history education in primary schools. When implemented with appropriate pedagogical frameworks, institutional support, and ethical considerations, digital technologies can transform classrooms into environments of exploration, inquiry, and critical learning. The future of technology-enhanced education depends not only on technological advancement but also on the ability to integrate innovation with meaningful educational goals.

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