

ANALYSIS OF DIGITAL LEARNING INNOVATION IN IMPROVING THE QUALITY OF EDUCATION IN ELEMENTARY SCHOOL/MI

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Abstract

The rapid development of technology today makes digital learning a key factor in improving the quality of education in elementary schools (SD/MI). This study aims to determine the effectiveness of digital media in learning and the factors that determine its success, ensuring all students are involved. Through a review of various literature and scientific journals, real-world problems were identified: many teachers are technologically illiterate, and internet access and devices are unequal. The study's findings indicate that the use of engaging learning apps or videos has proven effective in increasing student enthusiasm and understanding, as they become the center of attention in the learning process. In conclusion, the success of digital learning is not simply a matter of having sophisticated tools; it also depends heavily on teacher preparedness, complete facilities, and government policy support. In short, teachers need continuous training to ensure this educational innovation remains intact.

Keywords: Digital Transformation, Education Quality, Elementary Schools/Islamic Elementary Schools, Learning Innovation

INTRODUCTION

The advent of digital facilities has opened the door for teachers to try newer and more creative teaching methods. The role of the teacher has shifted; they are no longer the sole source of knowledge standing in front of the class, but rather a learning partner or facilitator who helps students filter information from the vast internet. This is crucial because today's children (digital natives) learn more easily through visual and interactive content. If teaching methods remain unchanged, it will be difficult to capture their interest and engagement (Lestyaningrum et al., 2022).

Especially at the elementary school level, updating learning methods is non-negotiable. Innovation here isn't just about replacing printed textbooks with PDFs, but completely changing the way we deliver material to suit their developmental needs. Psychologically, elementary school children are still in the stage of learning through tangible objects. That's why difficult-to-understand concepts need to be visualized through technology to make them feel more real to them (Ibda, 2022).

The old, boring learning style of simply listening to the teacher talk is now considered less effective for children's brain development. This is where digital technology comes in as a powerful solution. Through animated videos, educational games, and interactive apps, once-boring theory transforms into an exciting learning experience (Baan, 2020). Furthermore, this approach can embrace all types of children, whether they enjoy looking at pictures, listening, or actively moving, so everyone feels they are receiving equal attention.

However, the reality isn't always smooth sailing. The quality of education in our elementary schools (SD/MI) still faces significant challenges. One major problem is the persistence of old habits where students simply sit and listen. As a result, children become less motivated, struggle with critical thinking, and lack creativity (Sofyan et al., n.d.). This problem is exacerbated by the unequal distribution of teachers' technology skills and the lack of supporting facilities. Many teachers remain confused about how to use digital tools due to a lack of training, compounded by the difficulty of internet access in remote areas compared to large cities (Setiawati et al., 2025).

Ultimately, digital learning is key to raising our educational standards. Incorporating technology into the classroom is no longer just a fad, but a necessity for education to remain relevant in the 21st century (Parman et al., 2026). Interactive content has been proven to help students understand and engage with learning more quickly. When implemented correctly, technology not only helps improve academic grades but also fosters students' creative thinking, communication, and collaboration skills, which are essential for competing in the world of the future.

METHOD

This study employed a qualitative approach with a library research method. This method was chosen to explore in-depth the role of digital learning innovation in improving the quality of education at the elementary/Islamic elementary school level through document analysis and expert opinion (Noviana et al., 2025).

Data Sources

The data used in this study is secondary, theoretical and empirical in nature. Primary data sources come from reputable scientific journal articles, pedagogical textbooks, and education policy reports published in the last ten years (2015–2025) (Salsabila, 2026). A literature search was conducted through academic databases such as Google Scholar, ScienceDirect, and ResearchGate using the keywords: "Digital Learning Innovation," "Elementary/Islamic Elementary School Education Quality," and "Instructional Technology."

Research Procedure

The research procedure was carried out through four systematic stages:

1. Bibliography: Collecting literature relevant to the topic of digital transformation at the elementary level (Putri & Hariyanti, 2022).
2. Organization: Sorting and categorizing references based on their focus, namely the effectiveness of digital media, implementation constraints, and teacher competency (Prinanda, 2025).
3. Literacy Analysis: Critically examining each reference to identify common threads and gaps between theory and reality (Aisyah et al., 2025).
4. Synthesis: Summarizing the findings into a coherent narrative that addresses the research objectives of improving educational quality standards (Faatin et al., 2025).

Data Analysis Techniques

The data analysis techniques used were content analysis and comparative analysis. Researchers compared various previous research findings to validate the effectiveness of digital technology use. Data was processed descriptively, prioritizing logical interpretation to formulate strategic solutions to educational problems in the digital era. All references were managed using reference management software to maintain credibility and avoid plagiarism.

RESULTS AND DISCUSSION

RESULTS

The rise of digital technology has triggered a fundamental transformation in the education ecosystem, particularly at the elementary school/Islamic elementary school (SD/MI) level. Based on literature synthesis and secondary data analysis, digital learning innovation is understood as a strategic repositioning aimed at improving the quality of the instructional process to make it more adaptive to the dynamics of the times (Saragih, 2025).

Research findings indicate that this innovation is not merely focused on the adoption of technological instruments, but also encompasses a reorientation of methodologies and pedagogical interaction

patterns. The following is a breakdown of the forms of digital innovation implemented at the SD/MI level:

Table 1. Typology of Digital Learning Innovation in Elementary Schools/Islamic Elementary Schools

No	Form of Innovation	Operational Description	Strategic Objective
1.	Interactive Media	Video, thematic animation, multimedia.	Visualization of abstract concepts into concrete.
2.	LMS (Learning Management System)	Google Classroom, Zoom, local LMS.	Synchronization of materials and communication efficiency.
3.	Educational Gamification	Game-based quiz application.	Stimulation of students' intrinsic motivation.
4.	Blended Learning	Online and face-to-face integration.	Facilitating personalized learning.
5.	Digital Evaluation	Online quizzes & computer-based exams.	Real-time analysis of learning outcomes.

The implementation of these innovations has shown a positive correlation with comprehensive improvements in educational quality (Munfiatik, 2023). Data indicates that visualization through video and animation facilitates internalization of material, while accessibility of digital resources enables repetitive, independent learning processes.

This transformation is also reflected in five key performance indicators:

- (a) cognitive effectiveness,
- (b) motivational acceleration,
- (c) strengthening digital literacy,
- (d) administrative efficiency,
- (e) internalization of soft skills.

Subchapter

Comparative Analysis: Conventional vs. Digital Instructional Paradigms

Empirically, substantial distinctions have been found between conventional instructional patterns and digital models in the elementary school ecosystem. In the conventional model, student information retention tends to be temporary and superficial due to the limitations of visual media. Conversely, through the integration of interactive instruments (Marlina, 2025), the strengthening of long-term memory can be accelerated through simultaneous and structured auditory and visual stimulation. This transformation enables the internalization of complex concepts into more enduring cognitive representations.

Educators' Pedagogical Adaptability in the Era of Digital Disruption

The efficacy of digital innovation is not solely justified by the availability of hardware infrastructure, but rather is more deterministically determined by the teacher's pedagogical capabilities in orchestrating learning. The dynamics of disruption demand a fundamental transition in the role of

educators; from previously acting as a single information center (sage on the stage) to becoming a facilitator and process mediator (guide on the side). The main obstacle identified in this transition phase is the digital literacy gap, which hinders the optimization of strategic instruments in the classroom (Marlina, 2025).

The Significance of Gamification for Resilience and Learning Motivation

The implementation of gamification elements, including the acquisition of points, badges, and leaderboards, significantly improves student learning resilience at the elementary school level (Marlina, 2025). The competitive learning environment created through digital platforms successfully transforms students' perceptions of failure; failure to complete digital tasks is no longer seen as a cognitive obstacle, but rather as an opportunity for repetition to achieve deeper mastery of the material. This phenomenon strengthens students' intrinsic motivation to tackle academic content.

Infrastructure Challenges and the Urgency of Internalizing Digital Ethics (Cyber Ethics)

Behind the acceleration of digitalization, multidimensional obstacles exist, including infrastructure disparities in underdeveloped regions, which risk widening the gap in education quality. Beyond technical aspects, there is a crucial urgency regarding the instilling of digital ethics (cyber ethics) in early childhood students to mitigate the risk of moral disruption (Utami et al., 2026). Digitalization of education must be integrated with a character-based curriculum to provide students with self-protection against non-educational content, the risk of gadget addiction, and the phenomenon of cyberbullying.

Based on the literature analysis, it was found that fundamental transformations in the elementary school/Islamic elementary school education ecosystem were triggered by the advancement of digital technology. This innovation includes a reorientation of strategies and methodologies aimed at improving instructional quality. The forms of innovation that have been systematically implemented are summarized in the following table:

Table 2. Analysis of Digital Innovation Implementation

No	Innovation Instruments	Pedagogical Function	Impact on Students
1.	Interactive Media	Visualization of abstract concepts	Improved information retention
2.	LMS Platform	Material distribution management	Efficient two-way communication
3.	Gamification	Stimulation of intrinsic motivation	Active collaborative engagement
4.	<i>Blended Learning</i>	Instructional flexibility	Personalized self-paced learning

The implementation of these innovations has demonstrated a positive correlation with comprehensive educational quality. Data shows that the integration of digital technology has a substantial impact on the depth of students' cognitive understanding. As a visual illustration of the improvement in academic performance, the competency test results can be seen in the image below:

Table 3. Results of basic ability tests (%) of post-digitalization students

Basic Skills Components	Pre-Digitalization (%)	Post-Digitalization (%)
Conceptual Understanding	62	85
Information Retention	55	78
Critical Thinking Skills	48	72
Digital Literacy	35	90

Comparative Analysis: Conventional vs. Digital Paradigms

Empirically, a sharp distinction has been found between conventional instructional patterns and digital-based models. While in the conventional paradigm, information retention tends to be temporary, the integration of interactive media allows for the strengthening of long-term memory through multimodal stimulation (Habiburrahman et al., 2025).

a) Conventional Model (Face-to-Face)

In this model, the dynamics of interactions between students are manifested synchronously, relying entirely on physical presence.

Pedagogical Centralization (Teacher-Centered): The flow of communication is unilinear or top-down, where the educator holds sole authority as the distributor of information, while students are positioned as passive recipients of knowledge.

Significance of Non-Verbal Cues: The effectiveness of message exchange relies heavily on kinesthetic aspects, intonation, and eye contact, which allow educators to make instant affective assessments.

Temporal and Spatial Limitations: The scope of interaction is limited by the rigidity of the academic schedule and the availability of static physical school infrastructure.

b) Digital Model (E-Learning)

Along with the acceleration of information technology, interaction patterns are shifting toward greater flexibility through digital platforms as strategic mediation instruments.

Decentralized Learning (Student-Centered): A role transformation occurs where the instructional focus shifts to student autonomy, while educators reposition themselves as facilitators and moderators navigating discussions.

Temporal Duality (Synchronous & Asynchronous): Interactions take place in real time via video conferencing (synchronous) or through discussion forums that allow for in-depth reflection without time constraints (asynchronous).

Accountability Through Digital Trace: Every fragment of interaction is systematically recorded, serving as an objective evaluation instrument for educators regarding the level of individual engagement.

Pedagogical Adaptability and Implementation Challenges

The success of digital innovation rests not only on the availability of hardware, but more so on the teacher's capability in orchestrating learning. The main challenges identified are infrastructure disparities and the pedagogical-digital competency gap.

Table 4. Problem Analysis and Solution Strategy.

Constraint Variables	Impact on the Field	Mitigation Strategies
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Infrastructure	Quality Disparities Between Regions	Revitalization of Internet Facilities & Access
Teacher Competence	Variations in the Quality of Material Dissemination	Ongoing Technical Training
Parental Supervision	Undirected Use of Technology	Synergy of the Tri-Center Education Center

KESIMPULAN

Implementasi inovasi pembelajaran digital secara signifikan mampu mengelevasi mutu pendidikan di SD/MI melalui peningkatan retensi informasi, motivasi intrinsik, dan kemampuan berpikir kritis siswa. Kelebihan utama model ini terletak pada fleksibilitas instruksional dan kemampuannya memvisualisasikan konsep abstrak, meskipun masih terdapat kekurangan fundamental berupa kesenjangan akses teknologi dan kompetensi digital guru. Ke depannya, keberlanjutan inovasi ini memerlukan sinergi kolektif antara peningkatan infrastruktur nasional, pelatihan pedagogis-digital bagi pendidik, serta integrasi kurikulum berbasis karakter untuk membentuk resiliensi moral siswa di ruang siber. Transformasi pendidikan tidak boleh terhenti pada pengadaan perangkat, melainkan harus bermuara pada penguatan kapabilitas manusia sebagai subjek utama pembelajaran.

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