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Analyzing the Impact of Artificial Intelligence (AI) Integration on the Transformation of Teachers' Instructional Methods and Students' Learning Experiences in Elementary Schools

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Abstract
This study analyzes the impact of integrating Artificial Intelligence (AI) on the transformation of teachers' instructional methods and students' learning experiences in elementary schools, highlighting both the benefits and the challenges of implementation. The study employed a qualitative approach, using structured interviews with three elementary school teachers and three elementary school students, selected through purposive sampling. Data collection was conducted on 30 September (08:40–12:00) and analyzed descriptively through data reduction, categorization, and interpretation of the meaning of participants' statements. The interview results indicate that the use of AI in elementary schools remains limited; some teachers have not directly utilized AI and instead rely more on digital media or platforms, such as YouTube, TikTok, Canva, or search engines, to enrich learning materials. In terms of impact, the use of technology was perceived to accelerate the search for learning materials, facilitate the preparation of teaching resources, and increase students' motivation and ease in completing assignments. However, implementation also faces obstacles, including teachers' limited digital literacy, limited facilities and internet connectivity, and unequal access to devices among students, which may widen the digital divide. These findings underscore the need to strengthen teacher capacity, enhance infrastructure support, and effectively monitor technology use so that AI can be utilized wisely in elementary education.

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Introduction

Education today stands at the threshold of a significant transformation driven mainly by rapid technological advances, particularly the integration of artificial intelligence (AI). AI integration is now reaching various levels of education, including elementary schools (SD), which represent the most foundational stage in students' lives for character formation and the development of lifelong learning capacities. Teaching and learning processes in elementary education, which have traditionally been teacher-centered and relatively uniform in method, now face both challenges and opportunities to evolve. Importantly, AI is not intended to replace teachers; instead, it can work in collaboration with teachers to enhance instructional processes and personalize students' learning experiences (Untu et al., 2025). Elementary-school environments have unique characteristics, which require pedagogical approaches to consider children's cognitive, social, and emotional development during a period of rapid growth. Traditionally, elementary teachers have been tasked with administrative duties, planning lessons for diverse student ability levels, and conducting time-consuming evaluations. Students, on the other hand, vary in their backgrounds, interests, and learning paces. Consequently, in

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crowded classrooms, the gap between individual student needs and the ability to meet those needs often becomes a significant barrier to effective learning (Untu et al., 2025).

AI integration can address several classic challenges. One key potential contribution is the transformation of teachers' instructional methods by providing advanced tools to analyze learning data and recommend adaptive content and instructional strategies. AI can also offer immersive, interactive, and—most importantly—personalized learning experiences for students (Rifky, 2024). However, despite these promising potentials, AI integration also brings critical impacts that need to be examined. These include concerns about the dehumanization of education, whereby the teacher's role as an educator who embodies affective values and empathy might be substituted by technology. Teachers are not only instructors but also individuals who understand students' emotions and social development. Therefore, AI should be regarded as a supportive tool, not a replacement for teachers (Holmes et al., 2022). In addition, issues such as the digital divide, student data privacy, technological dependency, and the need to maintain humane interaction in elementary education must not be overlooked (Rifky, 2024).

Accordingly, this analysis aims to comprehensively examine the impact of AI integration on the transformation of teachers' instructional methods and students' learning experiences in elementary schools. The study examines how AI can enhance pedagogical effectiveness, as well as the ethical and practical challenges that arise during implementation. By understanding these multidimensional impacts, educational stakeholders can design appropriate strategies to leverage AI while mitigating risks, thereby creating a flexible and relevant foundation for education in the digital era. Research gaps persist regarding the integration of AI in elementary education. While the literature widely discusses AI's potential to personalize learning and improve teaching effectiveness, real-world practices in elementary schools remain limited. Teachers tend to use simple media such as videos or content-search applications rather than leveraging AI optimally. Moreover, teachers' limited technological literacy, inadequate infrastructure, and unequal student access to devices and the internet constitute significant barriers.

Research Method

This study employed a qualitative approach using in-depth interviews with teachers and students as the primary data collection method. Interviews are a technique used to collect research data (Putri, H. J., & Sri, M., 2025). In simple terms, an interview is an interaction process between an interviewer and an interviewee through direct communication. Qualitative research is defined as an approach for discovering and describing events in a narrative manner (Nurrisa et al., 2025). In this study, the researchers sought to examine in greater detail how AI use affects teachers' and students' engagement in the teaching and learning process.

The research participants consisted of three teachers and three elementary school students, selected through purposive sampling. Teachers were chosen because they have a direct role in designing and implementing technology-based learning. In contrast, students were chosen because they directly experience the impact of AI use in the learning process. The study was conducted at the end of September, specifically on 30 September from 08:40 to 12:00, using structured interviews with teachers and students. The interview technique was used to elicit information directly from relevant informants—teachers and students who had been involved in the use of AI-based learning media.

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The interview data were analyzed descriptively using qualitative procedures. The analysis involved reducing data, grouping relevant information, interpreting the meaning of participants' statements, and linking observational results with relevant theories concerning teacher and student engagement in the use of educational technology. Through interviews, the researchers aimed to obtain objective, in-depth, and goal-relevant information. The analysis process was conducted continuously from data collection through the writing of research findings.

Research Findings and Discussion

The application of artificial intelligence in teaching and learning involves basic concepts of AI in education. AI enables the development of intelligent systems that can analyze data, solve problems, and learn from errors. In educational contexts, AI explains how this technology can be utilized to enhance efficiency and effectiveness in learning, as well as how teachers' roles may evolve with the integration of AI (Hikmawati et al., 2023). AI integration in education is an innovative approach to providing more effective and efficient learning experiences. AI has the potential to support more personalized learning, identify students' unique needs, and provide faster response times (Budiyono et al., 2024). Additionally, AI can support teachers in implementing the curriculum, developing appropriate instructional strategies, and providing access to a broader range of educational resources.

Table 1. Teacher Interview Results

Code (Question)	Code Description	Interview Excerpt
What do you feel during instruction amid the widespread use of AI?	This question examines teachers' feelings, experiences, and psychological reactions when encountering and utilizing AI technology in daily learning activities, particularly as AI becomes increasingly prevalent. The focus includes perceived benefits, concerns, and emotional challenges.	"I have never used AI. So far, I only know that AI can answer questions. In learning, I usually look for material from videos or use simple media." (Teacher 1) "Constraints mainly come from students. In my view, AI is often used negatively. In our school, most students do not yet have mobile phones, unlike in other areas. Children also have not used technology positively; it is more often used for playing games, so their knowledge of AI is still minimal. My instruction is still manual, mostly using the lecture method." (Teacher 2) "Technology greatly helps learning, both for completing teachers' tasks and for independent learning. AI makes students more enthusiastic, motivated, and able to understand the material more easily. In addition, technology introduces the digital world, and for teachers, AI can function as an assistant in preparing materials or questions." (Teacher 3)
What changes have occurred since AI emerged in the continuity of the learning process?	This item explores observable changes in the learning process that have occurred since the emergence and use of AI.	"In our school, the influence of technology is still limited because students are not very familiar with technology or AI. Teachers' understanding is also minimal, so I usually only use platforms such as Ruang Guru or the Meta app to search for materials." (Teacher 1)

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Code (Question)	Code Description	Interview Excerpt
		"The influence of technology is still limited because students are not familiar with technology or AI, and teachers' understanding is also minimal. I usually only use platforms such as Ruang Guru or Meta to search for materials. Support tools such as LCD and sound systems exist, but they are not permanently installed, so preparation takes time and reduces instructional effectiveness." (Teacher 2)
		"I am more enthusiastic about learning with technology. Motivation increases because learning is more interesting, and my knowledge becomes broader because information can be obtained quickly from many sources, not only from books." (Teacher 3)
Can AI help maximize learning at school, or the opposite?	This item examines whether AI can contribute positively to enhancing the learning process or instead create new constraints in education.	"AI should be able to maximize learning, because it can answer questions and make it easier for teachers in the learning process." (Teacher 1)
		"AI should be invaluable because it provides various information. However, facilities in our school are still limited, so implementation is gradual. AI use requires guidance and socialization to prevent it from going in the wrong direction, as well as supervision at home to ensure technology is not misused. At school, facilities are also limited; for example, only an LCD is available." (Teacher 2)
		"Technology really helps learning, for example, in completing assignments, I can quickly search for references." (Teacher 3)
What is the biggest challenge in integrating AI into the elementary school curriculum?	This item examines the significant challenges faced by teachers and schools in integrating AI into their curricula and learning activities.	"The challenge is that I need to learn many new things, such as how to download learning media. Nowadays there are many media available, even on TikTok, so technology actually makes learning easier because sources are diverse." (Teacher 1)
		"The main challenge is limited knowledge about AI. I myself do not fully understand how to use it and more often use Google, Canva, YouTube, or Meta to search for materials and questions. A KKG program about AI exists, but it has not yet been implemented. Meanwhile, students' phone use is more for games or social media, so they are less motivated to read, write, and think critically." (Teacher 2)
		"The challenge lies in limited facilities and internet connectivity. Not all students have personal phones, while their use at school is also restricted to prevent misuse. Another barrier is frequently unstable networks and the gap in facilities between students who have phones and those who do not." (Teacher 3)

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Table 2. Student Interview Results

Code (Question)	Code Description	Interview Excerpt
Based on your understanding, what is AI?	This item inquires about the term "AI" as understood by students in general.	"It is like the Google app that can answer questions." (Student 1) "It is like the Gemini app that can be used to edit photos." (Students 2 and 3)
How do you feel when using AI to do homework?	This item explores students' feelings, experiences, and impressions when using AI for school assignments at home.	"Happy because I am not confused about finding the answer." (Student 1) "I feel very helped when doing assignments." (Student 2) "Homework gets finished faster." (Student 3)
What changes have occurred since AI emerged in the continuity of your learning process?	This item asks students to describe the changes they have observed in the teaching–learning process after the introduction and use of AI technology.	"Learning becomes easier and faster." (Student 1) "I can learn at home easily." (Student 2) "We become more enthusiastic about learning." (Student 3)

Based on interviews with three teachers and three students in elementary school, the integration of AI—viewed as a driver of transformation in teachers' instructional methods and students' learning experiences—appears to be limited in direct implementation. Most teachers have not explicitly used AI in their classroom practice; instead, they utilize digital media such as YouTube, TikTok, Canva, Meta, or Google to enrich instructional materials. This indicates that AI is primarily used as a supporting tool rather than as an active learning partner. Nevertheless, the use of digital media functions as an entry point for transforming conventional instruction into learning that is more interactive, varied, and student-centered. Additionally, learning can be tailored to meet students' needs, facilitating a more efficient learning process. Teachers therefore, need to learn foundational AI concepts and the skills required to use technology effectively (Girsang & Telaumbanua, 2024).

The positive impacts of integrating AI and digital media are visible. First, from the teacher's perspective, AI accelerates the search for materials, facilitates the preparation of teaching resources, and enables more creative variations in content delivery (Novela et al., 2024). This supports a shift away from one-way lecturing toward learning that emphasizes experience and exploration. Students perceive AI as a technology similar to Google that can answer questions; some students also describe AI as tools, such as Gemini, that can assist with photo editing. Students report positive impacts, including ease in completing homework, faster task completion, reduced confusion, and increased motivation, as they feel supported. AI-based media tend to motivate students to complete assignments more diligently and broaden their knowledge beyond textbooks, making learning more vivid and contextual.

However, several negative impacts require attention. The convenience of AI can weaken students' critical thinking and problem-solving abilities, as they may become accustomed to receiving instant answers without thorough analysis. Çela et al. (2024)

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emphasize that critical thinking is a crucial skill for analyzing and synthesizing data, making informed decisions, and solving complex problems. If not balanced with appropriate instructional strategies, this phenomenon may shift the teacher's role from facilitating critical thinking to merely providing materials. Moreover, insufficient parental monitoring can encourage technology use that deviates from educational goals—for example, using devices mainly for entertainment such as gaming or social media (Hernandez et al., 2024). This creates new challenges related to regulating children's digital behavior outside the classroom.

The integration of AI also highlights the digital divide in elementary-school settings (Werfhorst et al., 2022). While school facilities, such as projectors and LCDs, remain limited, not all students have access to digital devices or adequate internet. This situation creates unequal opportunities to benefit from AI and may widen learning outcome disparities among students. Therefore, transforming teachers' instructional methods through AI integration cannot be viewed solely as a matter of technical convenience; it must be situated within a broader effort to build an inclusive educational ecosystem. Teachers are required to enhance their digital literacy so they can guide the use of AI appropriately; students need to be trained to prevent the loss of critical thinking abilities and independent learning habits; and parents and schools must collaborate to provide supervision and supportive facilities.

Based on observations derived from interviews with teachers and students, the findings largely align with existing theories. The use of AI in elementary schools remains limited. Some teachers have not used AI directly but instead rely on digital platforms such as Canva, YouTube, TikTok, and others. The findings indicate that using Canva can improve students' learning achievement (Samsiyah et al., 2025). Teachers perceive that AI can help prepare materials and questions, making it easier for students to understand lessons; however, constraints include teachers' limited technology knowledge, lack of training, and limited school facilities and student-owned devices (Ardho & Permana, 2025). In principle, AI represents intelligent systems capable of analyzing each student's needs, presenting appropriate learning materials, and monitoring progress to provide timely assistance (Purba et al., 2025).

Conclusion

Based on the findings, the integration of AI in elementary schools has been shown to bring tangible transformations to teachers' instructional methods and students' learning experiences. AI facilitates teachers in preparing teaching resources, enriches instructional variation, and increases students' motivation and understanding through learning that is more interactive and personalized. However, the study also indicates that most teachers have not utilized AI optimally due to limited digital literacy and inadequate infrastructure. At the same time, students face unequal access to technology and the risk of reduced critical thinking skills due to their reliance on instant answers. The novelty of this study lies in mapping the dual impacts of AI integration—catalyzing innovation while also presenting challenges in maintaining a balance between technological efficiency and the humanistic values of elementary education. Based on these findings, further research should focus on developing adaptive and ethical AI-based learning models, enhancing teachers' digital literacy, and conducting classroom-based trials of AI implementation to optimize technological potential without diminishing the teacher's role as the primary educator.

Recommendations

Based on the findings, it is recommended that teachers continuously improve their digital literacy and competence in using AI-based technologies to support more effective and interactive learning. Schools should provide supporting facilities, such as adequate internet connectivity and

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regular training for teachers and students, so that AI can be implemented optimally and responsibly. In addition, parents are expected to play an active role in supervising their children's technology use at home, enabling them to use AI wisely and strengthen critical thinking and independent learning. Future researchers are also encouraged to broaden the scope of the study by involving more participants and developing AI-based learning models that are adaptive, ethical, and aligned with the characteristics of elementary-school learners.

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References

Ardho, R. I., & Permana, M. R. (2025). Eksplorasi Persepsi Guru Sekolah Dasar tentang Implementasi Kecerdasan Buatan dalam Pembelajaran di Kelas. *Journal of Education for All*, *3*(2), 129–134. https://doi.org/10.61692/edufa.v3i2.323

Budiyono, S., Azhari, P., & Pamungkas, M. A. B. (2024). Problem Penggunaan AI (Artificial Intelligence) dalam Bidang Pendidikan. *Al-DYAS*, *3*(2), 660–669. https://doi.org/10.58578/aldyas.v3i2.2935

Çela, E., Fonkam, M. M., & Potluri, R. M. (2024). Risks of AI-Assisted Learning on Student Critical Thinking. *International Journal of Risk and Contingency Management*, *12*(1), 1–19. https://doi.org/10.4018/ijrcm.350185

Girsang, L. B., & Telaumbanua, S. (2024). Revolusi Digital dan Dampaknya pada Pendidikan: Analisis Wacana Kritis tentang Transformasi Kurikulum. *Jurnal Pendidikan Tambusai*, *8*(1), 9829–9834.

Hernandez, J. M., Ben-Joseph, E. P., Reich, S., & Charmaraman, L. (2024). Parental Monitoring of Early Adolescent Social Technology Use in the US: A Mixed-Method Study. *Journal of Child and Family Studies*, *33*(3), 759–776. https://doi.org/10.1007/s10826-023-02734-6

Hikmawati, N., Imam Sufiyanto, M., & Jamilah, J. (2023). Konsep Dan Implementasi Kecerdasan Buatan (Artificial Intelligence) Dalam Manajemen Kurikulum Sd/Mi. *Abuya: Jurnal Pendidikan Dasar*, *1*(1), 1–16. https://doi.org/10.52185/abuyavol1iss1y2023278

Holmes, W., Bialik, M., & Fadel, C. (2022). Artificial intelligence in education: Contexts, methods and implications for teaching and learning. In *Artificial Intrlligrncr in Education* (Vol. 9, Issue 1).

Novela, D., Ari Suriani, & Sahrun Nisa. (2024). Implementasi Pembelajaran Inovatif melalui Media Digital di Sekolah Dasar. *Journal of Practice Learning and Educational Development*, *4*(2), 100–105. https://doi.org/10.58737/jpled.v4i2.283

Nurrisa, F., Hermina, D., & Norlaila. (2025). Pendekatan Kualitatif dalam Penelitian : Strategi , Tahapan , dan Analisis Data Jurnal Teknologi Pendidikan Dan Pembelajaran (JTPP). *Jurnal Teknologi Pendidikan Dan Pembelajaran (JTPP)*, *02*(03), 793–800.

Purba, N., Pujiati, D., Sihombing, P. S. R., Simanjuntak, H., & Sijabat, D. (2025). The Use of AI in Elementary School Learning: A Systematic Literature Review. *QALAMUNA:*

Vol.3, No.2 (October– 2025)
E-ISSN: 2987-4343
pp. 58-65

Jurnal Pendidikan, Sosial, Dan Agama, *17*(1), 83–98. https://doi.org/10.37680/qalamuna.v17i1.6761

Putri, H. J., & Sri, M. 2025. Metode Pengumpulan Data Kualitatif. *Jurnal Pendidikan Tambusai*. 9(2).

Rifky, S. (2024). The Impact of Using Artificial Intelligence on Higher Education. *Indonesian Journal of Multidisciplinary on Social and Technology*, *2*(1), 37–42. https://doi.org/10.31004/ijmst.v2i1.287

Samsiyah, N., Suharto, V. T., & Ulya, C. (2025). Artificial Intelligence (AI) in Language and Science Learning in Elementary Schools: Teacher Perceptions and Solutions. *Januari 2025 IJIS Edu : Indonesian J. Integr. Sci. Education*, *7*(1), 2025. http://dx.doi.org/10.29300/ijisedu.v7i1.3740

Untu, H. I., Fahrudin, S., & Effendi, R. (2025). Dampak Penggunaan Artificial Intelligence (Ai) Dalam Menyesuaikan Materi Pembelajaran Bagi Siswa Sekolah Dasar. *Jurnal Review Pendidikan Dan Pengajaran*, *8*, 4951–4956.

Werfhorst, H. G. Van De, Kessenich, E., & Geven, S. (2022). The digital divide in online education: Inequality in digital readiness of students and schools. *Computers and Education Open Journal*, *January*.