THE UTILIZATION OF ARTIFICIAL INTELLIGENCE (AI)-BASED LEARNING MEDIA IN PRIMARY SCHOOL LEARNING AND ITS IMPACT ON STUDENTS' LEARNING MOTIVATION

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Keywords: Artificial Intelligence, Learning Media, Learning Motivation, Primary Education.

ABSTRACT

The rapid development of digital technology, particularly Artificial Intelligence (AI), has significantly influenced primary education and highlights the urgency of integrating innovative learning media to enhance students' learning motivation. This study aims to systematically review research findings on the use of AI-based learning media in primary school learning and examine their implications for students' motivation. A qualitative approach was employed using a systematic literature review method. A total of 25 national and international peer-reviewed journal articles published between 2020 and 2025 were selected based on predefined inclusion criteria. Data were analyzed through qualitative content analysis, including data reduction, thematic categorization, and synthesis. The findings indicate that AI-based learning media, such as adaptive learning applications, intelligent tutoring systems, educational chatbots, and interactive digital media, positively affect primary school students' learning motivation by increasing engagement, learning interest, self-confidence, and active participation. However, challenges related to teacher competence, unequal technological infrastructure, and ethical and data privacy issues were also identified. In conclusion, AI-based learning media can effectively enhance students' learning motivation when implemented in accordance with pedagogical principles and the developmental characteristics of primary school students.

Abstrak

Perkembangan teknologi digital, khususnya kecerdasan buatan (Artificial Intelligence/AI), telah memberikan pengaruh signifikan terhadap pendidikan sekolah dasar dan menuntut pemanfaatan media pembelajaran yang inovatif untuk meningkatkan motivasi belajar siswa. Penelitian ini bertujuan untuk mengkaji secara sistematis hasil-hasil penelitian mengenai penggunaan media pembelajaran berbasis AI serta implikasinya terhadap motivasi belajar siswa sekolah dasar. Penelitian ini menggunakan pendekatan kualitatif dengan metode studi literatur sistematis. Sebanyak 25 artikel jurnal

nasional dan internasional bereputasi yang diterbitkan pada rentang tahun 2020–2025 dipilih berdasarkan kriteria inklusi yang telah ditetapkan. Analisis data dilakukan melalui analisis isi kualitatif yang meliputi reduksi data, kategorisasi tematik, dan sintesis temuan. Hasil kajian menunjukkan bahwa media pembelajaran berbasis AI, seperti aplikasi pembelajaran adaptif, sistem tutor cerdas, chatbot edukatif, dan media digital interaktif, berdampak positif terhadap motivasi belajar siswa, ditandai dengan meningkatnya keterlibatan, minat belajar, kepercayaan diri, dan partisipasi aktif. Kesimpulannya, media pembelajaran berbasis AI efektif dalam meningkatkan motivasi belajar siswa sekolah dasar apabila diimplementasikan sesuai dengan prinsip pedagogis dan karakteristik perkembangan peserta didik.

Kata kunci: Artificial Intelligence, Media Pembelajaran, Motivasi Belajar, Sekolah Dasar.

INTRODUCTION

The rapid development of digital technology in the 21st century has brought significant changes to various aspects of life, including the field of education. The education sector is required to adapt to technological advancements as well as to the increasingly dynamic characteristics of learners. Learning processes are no longer sufficient when oriented solely toward conventional content delivery; instead, they must be designed to create meaningful, interactive, and learner-centered learning experiences. In the context of primary education, this demand becomes particularly important, as primary schools serve as the foundational level of education that plays a strategic role in shaping students' attitudes, interests, and learning motivation.

Learning motivation is one of the key factors that determine the success of the learning process in primary schools. Students with high learning motivation tend to demonstrate active engagement, persistence in learning, and positive attitudes toward learning activities. Conversely, low learning motivation may result in reduced attention, limited participation, and a decline in learning outcomes. Therefore, primary school teachers are required to design learning activities that are not only aligned with curricular objectives but also effective in fostering and enhancing students' learning motivation.

However, learning practices in primary schools still face various challenges, one of which is the limited variety of learning media that remain dominated by conventional approaches. Learning activities that rely heavily on lecture methods and monotonous use of textbooks tend to cause boredom and reduce students' interest in learning. This condition presents a particular challenge in the digital era, as students are increasingly accustomed to interacting with technology in their daily lives.

Along with the advancement of information and communication technology, the integration of technology into learning is viewed as a strategic approach to improving the quality of the learning process. Educational technology enables the presentation of learning materials in more engaging, interactive, and contextual ways. One technological development that has recently gained considerable attention in the field of education is Artificial Intelligence (AI). In educational contexts, Artificial Intelligence refers to computer-based systems or applications capable of simulating human intelligence, such as analyzing learning data, providing real-time feedback, and adapting learning processes to learners' needs.

In primary school learning, Artificial Intelligence–based learning media have significant pedagogical potential. AI-based media can function as interactive learning tools, support adaptive learning, and serve as personalized learning aids that allow students to learn according to their individual abilities and learning pace. These characteristics have the potential to increase student engagement, strengthen learning experiences, and foster higher levels of learning motivation.

Various studies have indicated that the use of AI-based learning media can enhance student participation and engagement in the learning process. Adaptive and interactive media are able to create challenging yet enjoyable learning experiences, thereby positively influencing students' learning motivation. When students feel interested and receive learning experiences that match their needs, learning motivation tends to increase and supports the optimal achievement of learning objectives.

Nevertheless, the implementation of Artificial Intelligence–based learning media in primary schools still encounters several challenges. These challenges include limited teacher competence in pedagogically integrating AI, uneven technological infrastructure readiness, and ethical as well as data security concerns related to students. In addition, the use of AI at the primary education level must consider students' cognitive, social, and emotional developmental characteristics to ensure that the essential role of direct teacher–student interaction is not diminished.

On the other hand, scientific studies that specifically address the utilization of Artificial Intelligence–based learning media in the context of primary education—particularly those focusing on its implications for students' learning motivation—remain relatively limited. Existing studies generally focus on technological development, learning

outcomes improvement, or AI implementation at secondary and higher education levels. Systematic syntheses of research findings related to the use of AI-based learning media and learning motivation among primary school students are still scarce. This condition indicates the presence of a research gap that warrants further investigation.

Based on this background, this study aims to review and synthesize previous research findings regarding the utilization of Artificial Intelligence–based learning media in primary school learning and its implications for students' learning motivation. Through a literature review approach, this study is expected to provide a comprehensive overview of the forms of AI utilization in primary education, their pedagogical implications for enhancing students' learning motivation, as well as the opportunities and challenges associated with their implementation, serving as a basis for formulating contextual and applicable learning recommendations.

METHODS

This study employed a qualitative approach using a systematically conducted literature review to examine the utilization of Artificial Intelligence (AI)–based learning media in primary school learning and its implications for students' learning motivation. The research data were obtained from reputable national and international journal articles published between 2020 and 2025 and relevant to the research topic. The literature search was conducted through scientific databases, namely Google Scholar and SINTA, using the keywords *Artificial Intelligence*, *learning media*, *learning motivation*, and *primary school*, in both Indonesian and English.

The selected articles met the inclusion criteria of addressing the utilization of AI in the context of primary education and discussing learning motivation, student engagement, or affective aspects of learning, while articles that were not relevant to the research focus or that emphasized solely the technical development of AI were excluded. The selection process involved the identification of titles and abstracts, full-text review, and the determination of eligible articles, resulting in a total of 25 journal articles analyzed in this study. Data analysis was conducted using qualitative content analysis, which involved data reduction, thematic categorization, and the synthesis and interpretation of findings from previous studies. Data validity was ensured through the selection of reputable journal sources and cross-comparison of findings across articles as a form of source triangulation, thereby enhancing the credibility of the research conclusions.

RESULTS AND DISCUSSION

The results of the literature review of reputable national and international journal articles indicate that the utilization of Artificial Intelligence (AI)–based learning media in primary school learning has been implemented in various forms and learning contexts. In general, AI is utilized as part of digital learning media aimed at enhancing the effectiveness of the learning process and promoting active student engagement. In educational contexts, Artificial Intelligence is defined as computer-based systems designed to emulate human cognitive abilities, such as learning, analyzing data, and providing adaptive responses to support the learning process (Luckin et al., 2016).

1. Forms of Utilization of Artificial Intelligence–Based Learning Media in Primary Schools

The synthesis of the literature reveals that AI-based learning media in primary schools are utilized in several main forms, including adaptive learning applications, intelligent tutoring systems, educational chatbots, and interactive learning media based on the analysis of students' learning data. Adaptive learning applications enable the delivery of instructional content that is tailored to students' individual abilities and learning pace, thereby supporting more independent and guided learning. Intelligent tutoring systems function as digital learning assistants that provide immediate and personalized feedback on students' learning progress and errors.

In addition, educational chatbots are used as interactive learning tools that allow students to ask questions and receive instant explanations. AI-based interactive media also employ visualizations, educational games, and learning simulations to create more engaging and contextualized learning experiences. The utilization of these various forms of media indicates that AI not only serves as a tool for content delivery but also functions as a support system for adaptive learning that is responsive to the learning needs of primary school students. This finding aligns with the perspective of Holmes et al. (2019), who assert that AI has the potential to support personalized learning and enhance the quality of student learning interactions.

2. Implications of Artificial Intelligence–Based Learning Media for Students' Learning Motivation

Learning motivation is a crucial factor influencing students' engagement, persistence, and success in the learning process. Based on the findings of the literature

review, the utilization of AI-based learning media demonstrates positive implications for the learning motivation of primary school students. Interactive and adaptive learning media are able to create learning experiences that are more engaging, challenging, and enjoyable, thereby fostering increased interest and participation in learning activities.

The enhancement of students' learning motivation can be explained through the Self-Determination Theory proposed by Deci and Ryan (2000), which posits that learning motivation increases when students' basic psychological needs for autonomy, competence, and relatedness are fulfilled. AI-based learning media allow students to exercise greater control over their learning processes, receive feedback that enhances their sense of competence, and experience relatedness through responsive digital interactions. Furthermore, the application of AI in learning is consistent with the ARCS motivation model (Attention, Relevance, Confidence, Satisfaction) proposed by Keller (2010), whereby AI can capture students' attention, increase the relevance of learning content, build learners' confidence, and provide learning satisfaction through measurable achievements.

Various studies reviewed report that primary school students demonstrate increased enthusiasm, active participation, and self-confidence when learning is supported by AI-based media. Real-time feedback helps students understand learning errors without feeling pressured, thereby creating a more positive learning environment. These findings reinforce the results reported by Zawacki-Richter et al. (2019), who found that AI-based learning systems can enhance student engagement and learning motivation through personalized learning approaches.

3. Opportunities and Challenges in the Utilization of Artificial Intelligence–Based Learning Media in Primary School Learning

The literature review also identifies several opportunities associated with the utilization of Artificial Intelligence–based learning media in primary schools. AI offers opportunities to develop learning processes that are more personalized, flexible, and oriented toward students' needs. In addition, AI can assist teachers in continuously monitoring students' learning progress and providing timely instructional interventions. This perspective is consistent with Holmes et al. (2022), who emphasize that AI can function as a supportive tool for teachers in enhancing instructional effectiveness.

Nevertheless, various studies also highlight several challenges in the implementation of AI at the primary education level. These challenges include limited teacher competence in pedagogically integrating AI, disparities in technological infrastructure, and ethical as well as data security concerns related to students. The use of AI in primary school learning must also consider students' cognitive, social, and emotional developmental characteristics. UNESCO (2021) emphasizes that the application of AI in education should prioritize principles of equity, transparency, and the protection of children's rights.

4. Synthesis of Findings and Pedagogical Implications

Based on the synthesis of previous research findings, it can be concluded that Artificial Intelligence–based learning media have considerable potential to enhance the learning motivation of primary school students when implemented appropriately. Adaptive, interactive, and responsive media are capable of supporting meaningful, student-centered learning. The pedagogical implications of these findings indicate that primary school teachers need to possess adequate understanding and skills to effectively utilize AI as a learning medium. The integration of AI should be designed in alignment with learning objectives, students' developmental characteristics, and the core values of primary education, ensuring that AI serves as a pedagogical innovation that supports the enhancement of learning motivation without diminishing the strategic role of teachers in the learning process.

CONCLUSION

Based on a review of reputable national and international studies published between 2020 and 2025, this study concludes that Artificial Intelligence (AI)–based learning media have strong potential to enhance primary school students' learning motivation through adaptive, interactive, and personalized learning experiences. AI applications such as adaptive learning systems, intelligent tutoring, chatbots, and interactive media positively influence students' engagement, interest, self-confidence, and active participation. However, challenges remain in terms of teachers' pedagogical competence in integrating AI, unequal technological infrastructure, and ethical and data security concerns. Therefore, AI should be implemented systematically as a supportive instructional tool rather than a replacement for teachers, with policy support, adequate

infrastructure, and further empirical research needed to examine its effectiveness on students' motivation and learning outcomes.

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