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Integration Artificial Intelligence in Video Media to Improve Student Motivation: Systematic Literature Review

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ABSTRACT

This study aims to systematically analyze the integration of Artificial Intelligence (AI) in video-based learning media and its impact on enhancing students' learning motivation through a Systematic Literature Review (SLR) approach. Fifteen national and international journal articles published between 2015 and 2025 were systematically reviewed through the stages of identification, selection, eligibility, and synthesis. The analysis focused on the configuration of AI integration in educational videos, its contribution to students' learning motivation, and the challenges of implementation in diverse educational contexts. The findings reveal that the integration of AI in video learning effectively increases students' motivation, engagement, and interest by providing adaptive feedback, personalized content, and interactive learning experiences. Furthermore, AI-based videos promote self-regulated learning and enhance learners' confidence in managing their study processes. However, successful implementation remains dependent on teachers' digital competence, technological infrastructure, and ethical data management. Overall, integrating AI into video-based learning holds strong potential to create engaging, adaptive, and learner-centered environments that foster sustained learning motivation.

INTRODUCTION

Digital transformation has had a major impact on the world of education, especially in the interaction patterns between teachers, students, and learning materials. The shift from conventional learning to digital learning has encouraged the birth of various technology-based innovations. (Timotheou et al., 2023). One of the rapidly growing technologies with significant potential in the field of education is artificial intelligence (AI) (Huang & Hew, 2022). The application of AI allows the creation of an adaptive, personalized, and efficient learning system through the ability to analyze students' learning behavior, provide direct feedback, and adapt the material to individual abilities (Pellas, 2025). UNESCO (2023) affirms that AI integration is one of the main pillars of 21st-century education transformation, which plays an important role in strengthening science and technology literacy through digital learning.

In the context of physics learning, the use of artificial intelligence (AI) becomes relevant because this field requires abstract thinking skills, mathematical reasoning, and deep conceptual understanding. Many students still have difficulty understanding theoretical or microscopic physics concepts due to the limited learning media available (Rusnayati & Ariantara, 2024). Therefore, media innovations that are able to present concrete visual and contextual representations are needed so that students can relate theories to phenomena that occur in the real world. One alternative that is considered effective is the use of learning videos, because this media can display physical events dynamically, interestingly, and more easily understood (Mayer, 2021). However, conventional video still has limitations in meeting individual and adaptive learning needs.

Learning videos are multimodal media that integrate visual, audio, and text elements simultaneously, so that they can increase students' attention and memory. However, most of the learning videos are still passive, where students act as receivers of information without any two-way interaction. This condition makes the learning process tend to be one-way and less supportive of active involvement in building knowledge (Simangungsong, 2025). Learning will be more meaningful if students are actively involved in the learning process, not just passively receiving information (Dahlan, Sulthan, & Faridah, 2025). In the context of physics learning that demands conceptual understanding and high-level thinking skills, conventional video has not been fully able to facilitate complex cognitive activities in the process of constructing scientific concepts.

The integration of artificial intelligence (AI) in video media offers an effective solution to overcome the limitations of conventional learning videos. This technology is able to make videos interactive, adaptive, and intelligent in creating a personalized learning experience. Through the analysis of students' interaction patterns and responses, the AI system can recognize the individual's level of understanding, adjust the presentation of the material, and provide additional explanations as needed. In addition, AI is capable of providing automated feedback and remedial recommendations based on detected learning difficulties. With this ability, learning videos no longer function only as a means of delivering information, but develop into a responsive and data-oriented learning media.

Recent studies have shown that the integration of AI in physics learning videos has a positive effect on students' motivation, cognitive engagement, and concept understanding. Sabatini, Graesser, Hollander, dan O'Reilly (2023) assert that AI-based videos drive conceptual change from misconception to scientific understanding, while Treve (2024) found an increase in interest and learning outcomes in physics through AI-based interactive videos. In line with that, Khan et al. (2024) stated that AI-based learning strengthens students' confidence and critical thinking skills. Overall, empirical evidence shows that the application of AI in video media contributes significantly to improving the quality of physics learning.

Despite its great potential, the application of AI in physics learning still faces various obstacles. Saputri & Hamid (2025) revealed that the level of readiness of teachers in integrating AI technology is still low, especially in the aspects of digital literacy and pedagogy. Other obstacles include limited school infrastructure, lack of devices, and uneven internet connections. In addition, ethical issues such as student data protection, algorithm transparency, and reliance on automated systems are also concerns (Mazidah & Suwarna, 2025). The success of AI adoption is determined not only by its technological advancements, but also by the readiness of the education ecosystem and policy support oriented towards sustainable digital transformation (Djaini, Permana, & Mahmudin, 2025). Thus, an in-depth

scientific study is needed to map the direction of AI development in physics learning videos as a whole.

Theoretically, the application of AI in learning videos is based on constructivist theory and multimedia cognitive theory. Constructivism theory emphasizes that learners build knowledge through active interaction with their environment (Khasawneh & Khasawneh, 2025), while Mayer's (2021) multimedia cognitive theory highlights the importance of combining verbal and visual elements to deepen conceptual understanding. In addition, the Cognitive Load theory (Sweller, 2019) states that adaptive technologies such as AI can optimize the learning process by adjusting the presentation of information to the working memory capacity of students. Therefore, the integration of AI in physics learning videos not only reflects technological innovations, but also strengthens the psychological foundation in modern learning.

A review of previous studies reveals a gap between the potential of Artificial Intelligence (AI) as an educational innovation and its practical implementation in pedagogy. Most existing research focuses on the technological aspects of AI development, while studies that link AI integration, video-based learning, and the enhancement of physics conceptual understanding remain limited. This study aims to conduct a systematic review of the integration of Artificial Intelligence (AI) technology in videos and its implications for increasing student learning motivation, and identify the opportunities and challenges associated with its implementation in educational settings. The findings are expected to provide a theoretical foundation for developing AI-based physics learning media and serve as a valuable reference for educators and researchers in designing adaptive, contextual, and future-oriented learning aligned with 21st-century educational demands.

METHODS

This study employed the Systematic Literature Review (SLR) method to comprehensively analyze various studies discussing the integration of Artificial Intelligence (AI) in video-based learning media. The SLR approach was chosen because it provides a holistic mapping of research trends, application patterns, and the contribution of AI to enhancing students' learning motivation. This method was carried out systematically, transparently, and in a replicable manner to produce a valid and credible scientific synthesis. Through this approach, the study not only summarizes previous findings but also identifies research gaps and potential directions for future studies in technology-enhanced education.

The articles analyzed in this study were selected based on specific inclusion and exclusion criteria to ensure data relevance and quality. The inclusion criteria consisted of articles that discussed the application of AI in learning contexts, utilized video media as a learning instrument, and were published between 2015 and 2025. Eligible articles were sourced from reputable journals indexed in ScienceDirect or Google Scholar and had full-text accessibility. Meanwhile, the exclusion criteria applied to opinion papers, studies without a clear research methodology, or articles lacking empirical findings relevant to AI integration in video-based learning.

The scope of this review focused on four main dimensions: (1) configurations of AI integration in video-based learning media, (2) the impact of AI implementation on students' learning motivation, (3) challenges of AI application across educational levels, and (4) future directions and prospects of AI-based learning research. This scope limitation aimed to maintain analytical focus while ensuring that the synthesized findings provide clear

theoretical and practical contributions. Both national and international studies were included to present a comparative perspective between global trends and the Indonesian educational context in utilizing AI to enhance learning motivation.

The review procedure followed the standard SLR process, including stages of identification, screening, eligibility, data extraction, and synthesis. These stages are presented in Figure 1 to provide a more systematic overview of the research workflow.

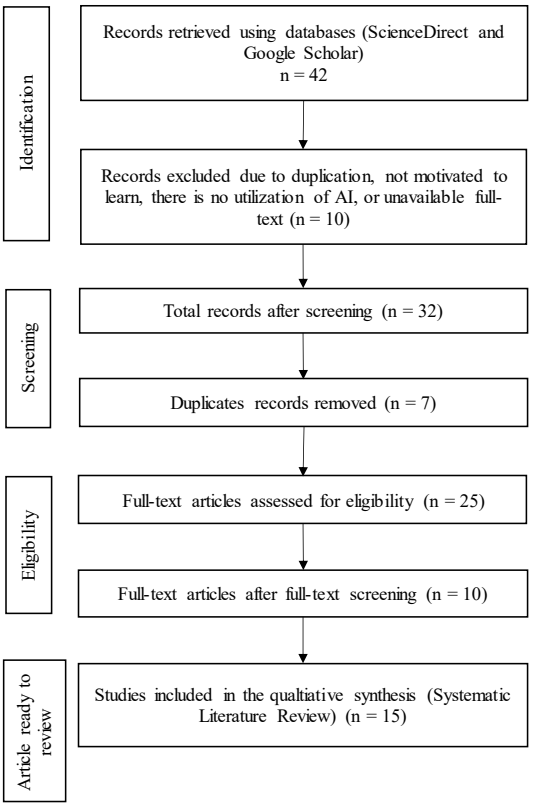

Figure 1. Flow diagram of Literature Selection Process

The Figure 1 illustrates the stages of the article selection process conducted through a *Systematic Literature Review (SLR)* approach in a systematic and structured manner. From a total of forty-two articles retrieved from the ScienceDirect and Google Scholar databases, ten were excluded due to duplication, lack of relevance to learning motivation, or unavailability of full-text versions. After the screening and duplicate removal stages, twenty-five articles were further assessed for eligibility, resulting in fifteen final studies that met the inclusion criteria and were included in the qualitative synthesis. This process ensured that the selected articles were highly relevant and scientifically credible for comprehensive analysis.

Data analysis employed a thematic synthesis approach to identify patterns, similarities, and differences among the reviewed studies. Each article was categorized according to emerging themes, such as the role of AI in learning, video media design, enhancement of learning motivation, and implementation challenges. The findings from each article were then compared and integrated to draw a comprehensive conclusion regarding the contribution of AI to improving students' learning motivation. Furthermore, the reliability of the synthesis was strengthened through cross-checking with similar sources to ensure that the interpretations remained objective, credible, and scientifically sound.

RESULTS AND DISCUSSION

Results

Based on the literature search conducted through reputable databases such as ScienceDirect and Google Scholar, a total of forty-two articles were initially identified discussing the integration of Artificial Intelligence (AI) in video-based learning and student motivation. The selection process was systematically carried out following the Systematic Literature Review (SLR) procedure, which included the stages of identification, screening, eligibility, and synthesis. Articles that were duplicated, did not meet the inclusion criteria, or lacked relevant empirical findings were excluded, resulting in fifteen final articles considered eligible for in-depth analysis.

The analysis of these fifteen studies indicates significant progress in the application of AI to support more adaptive, interactive, and learner-centered learning practices. The synthesized findings are presented in three main themes: (1) the configuration and role of AI in video-based learning media, (2) the effectiveness of AI in enhancing students' motivation and engagement, and (3) the challenges of implementation and future research directions.

Table 1. The Configuration and Role of AI in Video-Based Learning Media

Heading	Year	Research Objectives	Research Results	Similarities to Topics
Exploring the potential of using ChatGPT in physics education	2023	To explore the potential of ChatGPT in supporting physics learning.	ChatGPT helps explain difficult concepts and maintains students' learning interest.	Discusses the use of AI as an interactive component in video-based learning.
ChatGPT in physics education: A pilot study on easy-to-implement activities	2023	To apply ChatGPT in physics classroom activities.	AI facilitates conceptual discussions and stimulates curiosity among students..	Examines AI's role as an interactive agent that enhances student motivation.
Designing the Video-Based Learning Environments Using Workflow and Scaffolding	2024	To design AI-based video learning environments that support self-regulated learning.	AI-driven videos with automated feedback improve independent learning.	Investigates AI integration in video-based learning for adaptive experiences.
Development of Digital Module on Kinematics Material Assisted by Artificial Intelligence Video Through MOOCs	2025	To develop digital physics modules supported by AI-assisted videos.	AI videos enhance concept understanding and increase learning interest.	Applies AI in video learning to foster student motivation in physics.
Artificial Intelligence in	2023	To review the development of	AI supports content personalization and	Emphasizes AI's potential as a

Physics Education: A Comprehensive Literature Review	AI integration in physics education.	adaptive learning systems.	personalized video learning medium.

The analysis of Table 1 shows that Artificial Intelligence (AI) plays a diverse and significant role in developing adaptive and interactive video-based learning environments. AI is configured to function as both a personal tutor and a learning assistant capable of analyzing students' learning behaviors, providing adaptive feedback, and delivering instructional materials tailored to individual needs. Several studies indicate that the use of AI tools such as ChatGPT facilitates conceptual dialogue, stimulates curiosity, and sustains students' engagement throughout the learning process. In addition, AI-based videos incorporate workflow designs and scaffolding mechanisms that promote self-regulated learning while enhancing students' motivation. The integration of AI transforms the learning process from a passive reception of information into a more dynamic and participatory experience, where learners are guided adaptively according to their progress. Overall, these configurations demonstrate that AI contributes not only to personalization and adaptability but also to creating meaningful, motivating, and learner-centered educational experiences.

The first section of this review emphasizes the pivotal role of AI as a core component in designing responsive physics learning supported by data analytics. Nevertheless, the effectiveness of such systems requires further investigation, particularly regarding their impact on learning outcomes, conceptual mastery, and students' affective engagement through the integration of AI within video-based learning media.

Table 2. The Effectiveness of AI in Enhancing Students' Motivation and Engagement

Heading	Year	Research Objectives	Research Results	Similarities to Topics
Integrating Artificial Intelligence in Education: Impacts on Student Learning and Innovation	2024	To analyze the effects of AI on innovation and student outcomes.	AI fosters learning motivation, creativity, and engagement through adaptive environments..	Focuses on AI's influence on students' motivation and participation.
Artificial Intelligence Assisted Teaching and Learning and Research of Environmental Sciences	2025	To examine the impact of AI on student self-efficacy and motivation.	AI strengthens students' confidence and intrinsic motivation.	Shares focus on motivational and affective outcomes in AI-based learning.
The Impact of AI-Generated Instructional Videos on	2025	To assess AI-generated videos' influence on teacher and	AI-produced videos increase engagement, interest, and	Explores how AI-driven videos enhance learning motivation.

Teacher Education		student experiences.	learning motivation.	
Meta-Analysis of Science Literacy Ability in Physics Subjects	2025	To conduct a meta-analysis of science literacy in physics education.	AI and digital simulations improve scientific literacy and learning motivation.	Highlights AI's contribution to motivation and engagement in science learning.
Religious Learning Video Media in the Independent Learning Curriculum	2023	To evaluate the effectiveness of learning videos on student interaction.	Video learning increases student attention and participation.	Demonstrates the motivational value of video media in learning contexts.

The analysis of Table 2 demonstrates that the application of Artificial Intelligence (AI) in education has shown strong effectiveness in enhancing students' learning motivation and engagement. Various studies affirm that AI creates adaptive, creative, and interactive learning environments through personalized feedback and contextualized learning experiences. AI-generated instructional videos have been proven to increase students' interest, participation, and confidence throughout the learning process. Moreover, AI fosters students' intrinsic motivation and self-efficacy by providing learning opportunities that align with individual abilities and learning pace. This technology also stimulates curiosity and emotional engagement through dynamic visualization and interactive content. Overall, the effectiveness of AI in learning is evident in its ability to establish meaningful, engaging, and learner-centered experiences that promote both motivation and active participation.

Although Artificial Intelligence (AI) holds great potential to enhance the quality of learning, its implementation across educational contexts still faces several challenges. Research indicates that the success of AI integration depends not only on technological advancement but also on teachers' readiness, infrastructure availability, and supportive educational policies. Furthermore, ethical concerns and data security issues require careful attention to ensure that the use of AI remains responsible and aligned with pedagogical values. Therefore, Table 3 presents various implementation challenges and future research directions that can serve as a foundation for the sustainable application of AI in education.

Table 3. The Challenges of Implementation and Future Research Directions

Heading	Year	Research Objectives	Research Results	Similarities to Topics
Teachers' Readiness and Digital Competence in Implementing AI Learning Tools	2025	To evaluate teachers' readiness for AI-based instruction.	Teachers show limited digital literacy and AI proficiency.	Highlights teacher readiness as a key factor for effective AI integration.
Improving the Competence of Physics Teachers	2025	To enhance teachers' competence	Training increases teachers' confidence and	Supports the need for teacher preparation in AI-

through AI-Based Training		through AI-based professional training.	digital teaching skills.	enhanced learning.
Ethical Challenges of Artificial Intelligence in Education	2024	To examine ethical issues in the educational use of AI.	Identifies concerns regarding data privacy and algorithmic bias.	Connects ethical considerations to the responsible use of AI in learning.
Transformative Pedagogy: A Comprehensive Framework for AI Integration in Education	2025	To propose a framework for adaptive pedagogy in the AI era.	Effective AI use depends on systemic educational policies.	Aligns with the topic through a focus on sustainable AI integration.
Impacts of Digital Technologies on Education and Factors Influencing Schools' Digital Transformation	2023	To identify factors affecting digital transformation in schools.	Technological infrastructure and policy support are key success factors.	Relates to environmental readiness for AI-based video learning.

The analysis of Table 3 reveals that the implementation of Artificial Intelligence (AI) in education faces several multidimensional challenges, encompassing teachers' competence, technological infrastructure, educational policy, and ethical considerations. Several studies emphasize that limited digital literacy and pedagogical proficiency among teachers remain major barriers to the effective integration of AI in schools. In addition, uneven access to technology and the lack of supportive policies also hinder the sustainable adoption of AI-based learning. Ethical issues such as data privacy and algorithmic bias are highlighted as critical aspects that must be addressed to ensure responsible AI use in education. Therefore, future research should focus on strengthening teachers' digital competence, developing adaptive educational policies, and building inclusive and equitable technological ecosystems. These efforts are essential to ensure that the implementation of AI in learning is not only technologically effective but also aligned with pedagogical values and the principles of sustainable education.

Discussion

The convergence between constructivism theory, multimedia learning, and cognitive load reveals the capacity of artificial intelligence (AI) in transforming physics learning videos into a dynamic and responsive learning ecosystem. In a constructivist perspective, AI converts video from a one-way information conveyor medium into an interactive platform that encourages knowledge acquisition through self-exploration and cognitive dialogue. Meanwhile, the principle of multimedia learning (Mayer, 2021) emphasizes that the synergy between visual, narrative, and AI-based interactivity elements has the potential to ease cognitive burden, while transforming abstract physics concepts into mental models that are more structured and easy to internalize.

The function of AI as a smart tutor allows for precise diagnosis of learning difficulties as well as the provision of personalized scaffolding (Utami, Risdianto, & Purwanto, 2025). This ability not only empowers students, but also enables teachers to make more timely and accurate pedagogical interventions. This paradigm shift from passive video to an adaptive format significantly deepens cognitive engagement. AI facilitates generative learning by adjusting the order and depth of material based on individual comprehension profiles, which ultimately optimizes the knowledge transfer process (Firmansyah, Rika, Nadiyyah, & Handayani, 2025).

On the affective dimension, the implementation of AI-based video contributes to increased intrinsic motivation, self-efficacy, and learning autonomy. This sensation of engagement arises as a consequence of a personalized learning experience and in accordance with the learning rhythm of each individual. However, the adoption of this technology in the real context is still overshadowed by challenges such as the gap in teachers' digital competencies, infrastructure readiness, and ethical vulnerabilities in data management. Therefore, sustainable integration requires tripartite collaboration between education practitioners, engineers, and policy makers to ensure that the use of AI remains aligned with pedagogical, sustainable, and learner-centered principles (Kayal, 2024).

Overall, these findings reaffirm the significant potential of Artificial Intelligence (AI) as a catalyst for transforming video-based learning media toward a more adaptive and learner-centered paradigm. The optimal realization of this potential relies on the quality of instructional design, the digital competence of educators, and the readiness of technological infrastructure. Furthermore, the sustainability of AI integration requires systemic educational policies and collaborative efforts among teachers, researchers, and policymakers to build an inclusive and ethically responsible digital ecosystem. When these elements are harmonized, AI can effectively support meaningful learning experiences and foster continuous student motivation in the digital learning era.

CONCLUSION

Literature analysis confirms that the adoption of artificial intelligence in physics learning video media has a substantive impact on the cognitive and affective dimensions of students. As an adaptive tutor system, AI functions to provide automatic responses, map learning difficulties, and customize learning content according to individual student profiles. Pedagogically, this integration is in line with the constructivist framework and multimedia learning theory that emphasizes the creation of interactive, contextual, and personalized learning environments. However, the optimization of its implementation is still conditioned by several critical factors, including the digital capabilities of educators, the completeness of technological infrastructure, and ethical considerations in handling data. Therefore, successful integration requires a comprehensive approach that includes teacher competency enhancement, systematic policy support, and further research exploration of the impact of long-term conceptual development. With the right configuration, AI technology in video learning has the potential to be a catalyst for transformation towards a responsive and sustainable physics learning ecosystem.

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