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Reimagining Human Presence in AI Mediated Learning Environments

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ABSTRACT

The integration of artificial intelligence (AI) in the world of education is growing rapidly and bringing significant changes to the learning process. While AI technology offers personalized learning, automation, and adaptive feedback, its existence also raises questions about the role and meaning of human presence in AI-mediated learning environments. This study aims to reconstruct the concept of human presence in an AI-based learning environment and analyze its reinforcement strategies to support learning effectiveness. This study uses a descriptive qualitative approach through literature studies and reflective analysis of AI-based learning practices in higher education. Data were obtained from scientific articles, education policy documents, and practices of implementing AI in the context of learning. The analysis focused on the three dimensions of human presence, namely cognitive presence, social presence, and instructional presence. The results show that AI-mediated learning environments do not eliminate human presence, but rather transform them. Human presence continues to play an important role in guiding critical thinking processes, building social interactions, and ensuring that learning takes place in a contextual and ethical manner. However, without a planned pedagogical design, the use of AI has the potential to reduce the relational and affective dimensions of learning. Therefore, AI integration needs to be based on a human-centered approach that places educators as reflective facilitators and guardians of human values in the educational process. This study concludes that the reimagination of human presence in an AI-based learning environment demands a balanced synergy between technological innovation and pedagogical intentionality, so that AI functions as a supporting tool, not a substitute for the role of educators.

Key Word *Artificial Intelligence, Human Presence, AI-Based Learning, Higher Education, Educational Innovation.*

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INTRODUCTION

The development of artificial intelligence (AI) in education is accelerating and is starting to reshape the way we learn, teach, and manage the learning process. AI now comes in various forms from adaptive learning systems, natural language-based chatbots, to generative AI that can help with material preparation, training, and

evaluation (Luckin, 2025). At the practical level, the use of AI is often promoted because of its ability to provide more personalized learning support, improve educators' work efficiency, and expand access to digital learning resources (Sihaloho & Napitupulu, 2024). In the Indonesian context, this dynamic seems to be increasingly prominent as the use of AI tools such as ChatGPT increases in school and higher education environments, both for material development, learning assistance, and academic tasks (Setiyanti & Pipa, 2025).

However, the acceleration of AI integration also raises pedagogical problems that are not simple, especially related to the risk of learning that is increasingly "automated" but increasingly lacks human relationships. Research and policy reviews emphasize that the application of AI in education is often accompanied by the "promise" of efficiency and personalization, but can pose dilemmas related to ethics, bias, privacy, transparency, and dwarfing the role of educators as mere technology operators (Holmes et al., 2023). In the national literature, a similar issue arises in the generative AI adoption discourse: effective adoption is not only a matter of tool availability, but also readiness of values, competencies (e.g. prompt ability), governance, and collaboration between education stakeholders (Sugiono, 2024). This shows that the challenges of AI in education are not adequately answered by "using technology," but rather require a pedagogical framework that maintains the quality of learning as a social and ethical process (Altinay et al., 2024).

At the policy level, Indonesia is also moving towards strengthening digital literacy and artificial intelligence. The government has issued guidelines for the implementation of coding and artificial intelligence at the PAUD, primary and secondary education levels as well as guidelines for related subjects to help education units design learning that is student-centered and aligned with learning outcomes (Kemendikdasmen, 2025a). This policy direction emphasizes that AI is understood as a future competency that needs to be integrated into learning. However, it should be noted that the expansion of AI integration must also be accompanied by attention to "human presence" so that the learning process does not lose its relational dimension and the formation of meaning (Kemendikdasmen, 2025b).

The concept of human presence is a key issue because meaningful learning is not only determined by access to information, but also by interaction, sense of belonging, pedagogical guidance, and students' opportunities to build understanding reflectively. In online and blended learning studies, the Community of Inquiry (CoI) framework is often used to explain the quality of the learning experience through the interaction of three presences: cognitive, social, and teaching presence. Recent studies show that "presence" plays a powerful role in learning engagement, understanding construction, and quality of academic interactions (Parrish et al., 2021; Yu & Li, 2022). In fact, recent research developments also propose the expansion of the CoI framework to capture

learners' agency (learning presence), which emphasizes that the quality of digital learning cannot be separated from the role of humans as directors, actors, and decision-makers of learning (e.g., in self-regulation, learning goals, and reflection) (ElSayad, 2023).

In an AI-mediated learning environment, human presence does not automatically disappear, but changes shape. AI can help provide quick responses, material recommendations, or learning support, but it does not inherently present the relationships, empathy, or ethical responsibility that are typically inherent in educator–learner interactions. In Indonesia, practice in schools and vocational education shows that AI can improve efficiency and engagement if accompanied by adequate infrastructure and professional development (Maulidin, 2025). These findings lead to one important question, as AI increasingly enters classrooms and learning platforms, how can human presence be maintained (or even strengthened) to keep learning meaningful, ethical, and contextual.

Based on this background, this article aims to reimagine human presence in an AI-mediated learning environment by emphasizing the strategic role of cognitive, social, and instructional presence in maintaining the quality of learning. In particular, this paper seeks to examine how AI reshapes pedagogical relationships and learning experiences, and formulate a human-centered direction of AI integration, namely placing technology as a supporting tool that strengthens the role of educators and student agencies, not replacing them.

RESEARCH METHOD

This research uses a qualitative approach with a conceptual-analytical study design to reconstruct and reimagine the concept of human presence in an artificial intelligence (AI)-mediated learning environment. This approach was chosen because the research does not aim to quantitatively test the relationship between variables, but rather to conduct theoretical synthesis and critical reflection on the development of AI integration in education. Conceptual studies allow the development of a framework of thought through the integration of literature and systematic argumentative analysis (Jaakkola, 2020).

Research data in the form of secondary data obtained through a search of scientific literature and relevant education policy documents in the last five years (2020–2025). Literature sources include indexed international and national journal articles, research reports, and regulations or guidelines for the implementation of AI in the context of learning. The literature search process is carried out in a structured manner by following the principle of systematic literature mapping which emphasizes the transparent identification, selection, evaluation, and synthesis of sources (Booth et al.,

2021). Keywords used in the search include artificial intelligence in education, AI-mediated learning, human presence, community of inquiry, and human-centered AI.

Data analysis was conducted using a reflective thematic analysis approach to identify patterns of meaning related to the transformation of human presence in AI-based learning (Braun & Clarke, 2021). The stages of analysis include the process of familiarization with the literature, conceptual coding based on cognitive, social, and instructional presence dimensions, and reflective interpretation to build a coherent conceptual framework.

The analytical framework refers to the theory of Community of Inquiry which emphasizes the importance of cognitive, social, and teaching presence in maintaining the quality of digital learning (Garrison, 2024), as well as being associated with a human-centered AI perspective that places ethical values, relationships, and human responsibility as the foundation of technological integration (Floridi & Cowls, 2022). To maintain conceptual credibility, triangulation of sources is carried out by comparing findings from different types of literature as well as academic discussions to ensure consistency of interpretation. Through this approach, the research seeks to produce conceptual formulations that are contextual and relevant to AI-based learning practices in Indonesia.

RESULTS AND DISCUSSION

The results of the research were obtained through thematic analysis of 32 scientific articles and 6 education policy documents published in the 2020–2025 period. The analysis was conducted using a Community of Inquiry (CoI) framework that covers three dimensions of human presence—cognitive, social, and instructional presence—and is enriched with a human-centered AI perspective. Based on the coding process and synthesis of the literature, three main findings were found related to the transformation of human presence in an AI-mediated learning environment.

Cognitive Presence Transformation

The results of the analysis show that artificial intelligence (AI) contributes significantly to supporting learning personalization and cognitive scaffolding through adaptive feedback and material recommendations. The use of AI improves learning efficiency and expands access to information resources. However, AI's ability to encourage critical and reflective thinking remains dependent on pedagogical design and educator intervention. Without reflective facilitation from teachers or lecturers, learning tends to be procedural and task-oriented.

These findings show that cognitive presence in AI-based learning environments is irreplaceable, but rather transformed. AI serves as a support for initial information processing, while educators remain central to guide the elaboration of meaning and the development of higher-level thinking.

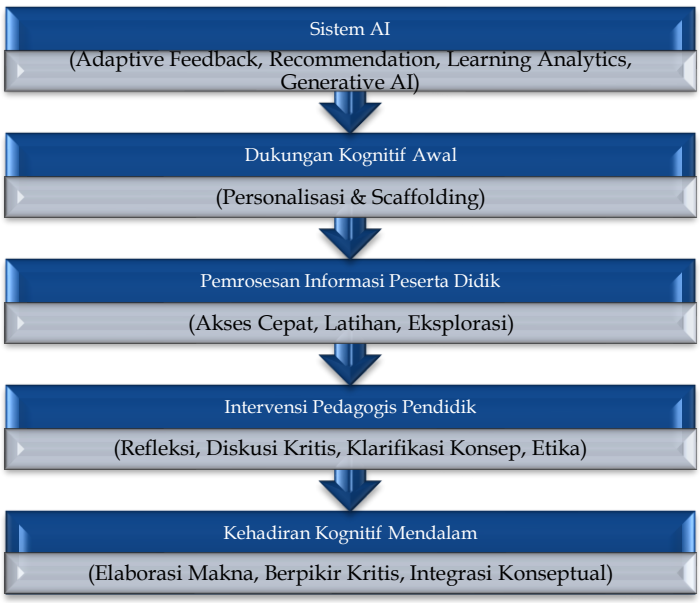

Figure 1.
Cognitive Presence Transformation Diagram in AI-Mediated Learning

The diagram illustrates that AI plays a role in the early stages of cognitive support through personalization and adaptive information provision. However, to achieve a profound cognitive presence characterized by analytical, reflective, and integrative abilities human pedagogical intervention is required. Without the stage of reflection and critical dialogue facilitated by educators, the learning process has the potential to stop at the level of surface information processing.

Thus, AI serves as an accelerator of learning, while humans play the role of a director of meaning construction and a developer of high-level thinking capacity. The synergy between the two is the foundation in reimagining cognitive presence in an AI-based learning environment.

Social Presence Dynamics

The results of the analysis show that AI integration affects the dynamics of social interaction in learning. Most of the literature emphasizes that the use of chatbots or virtual assistants improves communication responsiveness and rapid access to learning support. However, the same findings also suggest that affective dimensions in learning—such as empathy, warmth, and trust—are still highly dependent on human interaction.

In the perspective of the Community of Inquiry, social presence refers to the ability of learners to build a sense of connection and emotional self-projection in a learning environment. AI is able to facilitate functional communication, but it has not yet fully brought the authenticity of interpersonal relationships that is the foundation of academic engagement. Studies in the context of Indonesian higher education show that

students still view direct interaction with lecturers as an important factor in building motivation and a sense of belonging to the learning community. A summary of the role and limitations of AI in the social presence dimension can be seen in Table 1.

Table 1.
The Dynamics of Social Presence in AI-Mediated Learning

Social Presence Aspect	The Role of AI in Learning	Limitations of AI	The Role of Humans That Remain Necessary
Communication responsiveness	Provide quick response and 24/7 support via chatbot or virtual assistant	Interactions are automated and less contextual	Provide in-depth clarification and responses tailored to students' emotional needs
Academic connectivity	Facilitate online discussions and participation notifications	Unable to build a sense of interpersonal closeness	Building a *sense of belonging* in the learning community
Motivational support	Provide task reminders and instant feedback	Lack of empathy and relational warmth	Provide affective support and personal motivation strengthening
Dialogical interaction	Provide a simulation of academic conversations	Lack of ability to capture emotional nuances and nonverbal expressions	Facilitate reflective discussions and meaningful interactions

These findings indicate that AI serves as a communication amplifier, but it cannot replace the relational and affective dimensions that shape the quality of social presence. Therefore, AI integration needs to be designed as a complement to human interaction, not a substitute.

Repositioning Instructional Presence

The results of thematic analysis of 32 scientific articles and 6 policy documents show that the instructional presence dimension undergoes the most significant transformation in AI-mediated learning environments. Based on mapping using a Community of Inquiry (CoI)-based analysis matrix, as many as 27 out of 32 articles (84%) explicitly emphasized that the role of educators is not reduced, but rather strategic repositioning. AI integration is driving the shift in the role of educators from

informants to designers of learning experiences, facilitators of reflection, and directors of the ethical and contextual use of technology.

The analytical instruments used to identify this repositioning include indicators, AI-based learning design, ethical supervision and academic integrity, technology-based interaction management, and strengthening AI literacy and digital competence. The coding results show that international literature tends to emphasize aspects of instructional design and pedagogical control, while national literature and policy documents highlight more the urgency of teacher capacity building in digital literacy and AI literacy.

In the Indonesian context, the education policy document emphasizes that AI integration must be aligned with learning outcomes and national educational values. The policy emphasizes the importance of teacher training in the responsible use of AI, including the ability to conduct critical evaluations of content generated by AI systems. This shows that instructional presence serves as a quality control mechanism and a guardian of learning integrity.

In addition, the literature also shows that without the active involvement of educators, the use of AI has the potential to lead to overdependence, algorithmic bias, and a decrease in the quality of authentic assessments. Therefore, the repositioning of instructional presence is not only technical, but also normative and ethical. Educators act as mediators between AI systems and learners' learning needs, ensuring that technology supports pedagogical goals, not replaces them.

Conceptually, these findings show that The presence of instructional presence in AI-mediated learning is transforming into a strategic function that includes design, supervision, evaluation, and ethical reflection. Thus, the higher the level of AI integration, the more important the role of educators as pedagogical directors and decision-makers.

Table 2.
Instructional Presence Repositioning Indicator

Analysis Indicators	Number of Sources Supported	Percentage	Implications
Educators as AI-based learning designers	24	75%	Need for technology-based instructional design competencies
Oversight of academic ethics and integrity	27	84%	Teachers as guardians of academic validity and originality

Strengthening AI literacy and digital competence	23	72%	Professional training is a priority need
Control of technology dependency	20	63%	AI integration must be based on pedagogical balance

The data in the table show that the instructional dimension has the highest level of urgency compared to the cognitive and social dimensions. This indicates that the success of AI integration is largely determined by the capacity of educators to design and manage learning. In other words, AI expands pedagogical possibilities, but the quality of its implementation remains within the domain of human decision.

Discussion

The findings of this study show that the integration of artificial intelligence (AI) in learning does not eliminate human presence, but rather transforms its form and function. This transformation can be seen in three main dimensions cognitive, social, and instructional which within the framework of the Community of Inquiry (CoI) become the foundation of meaningful learning experiences (George & Wooden, 2023). The results of the analysis indicate that AI serves as an enhancer of learning efficiency and personalization, but the quality of reflection, relationships, and pedagogical control remains in the human domain (Davis et al., 2024).

On the cognitive dimension, AI has proven to be effective as an accelerator of information processing through adaptive recommendation systems and automated feedback. However, as shown in the results of the synthesis, the development of critical thinking and the elaboration of meaning still requires the intervention of educators (Phillips, 2023). These findings reinforce the argument that technology can expand access to information, but it does not inherently build reflective and metacognitive capacity. Thus, a profound cognitive presence occurs when AI is used as an aid in learning design frameworks that encourage critical dialogue and conceptual clarification.

In the social dimension, AI integration improves communication responsiveness and access to academic support. However, AI-based interactions tend to be both functional and transactional (Shwedeh, 2024). Social presence in learning is not only related to the exchange of information, but also the formation of a sense of belonging, empathy, and trust. This discussion shows that human relationality remains the main factor in building academic connections (Felten & Lambert, 2020). In other words, AI can expand communication, but it doesn't fully replicate the authentic quality of interpersonal relationships.

The instructional dimension shows the most significant transformation. Educators are experiencing a repositioning of roles from informants to designers of learning experiences and directors of the ethical and contextual use of AI (Schiff, 2022). These findings are consistent with the direction of education policy in Indonesia which emphasizes the importance of digital literacy and AI literacy for teachers. This repositioning shows that the higher the level of AI integration, the more important the function of educators as pedagogical decision-makers and guardians of academic integrity. Without supervision and targeted design, the use of AI has the potential to cause overdependence and reduce the depth of the learning process.

Integratively, the results of this study lead to an AI-based learning model that is human-centered. In this model, AI is positioned as a support system that strengthens access, efficiency, and differentiation of learning, while humans retain control over reflection, relationships, and pedagogical direction. The synergy between technology and educators is key in maintaining a balance between digital innovation and educational values (Gulyamov et al., 2025).

The practical implications of these findings are the need to strengthen the competence of AI-based learning design for educators, the development of ethical guidelines for the use of AI, and the integration of reflective approaches in classroom practice. In addition, education policies need to ensure that AI adoption does not simply follow innovation trends, but is aligned with learning objectives and characteristics of learners.

This research has limitations because it is based on a literature review and has not tested the conceptual model empirically in a real classroom context. Therefore, further research can test the effectiveness of human-centered AI learning models through quantitative or mixed methods approaches, especially in measuring its impact on students' engagement, critical thinking, and quality of social interaction.

CONCLUSION

This study reimagines human presence in AI-mediated learning environments through the lens of the Community of Inquiry framework and a human-centered AI perspective. The findings demonstrate that the integration of artificial intelligence in education does not eliminate human presence; rather, it transforms and repositions its functions across cognitive, social, and instructional dimensions.

AI effectively supports personalization, adaptive feedback, and learning efficiency, particularly at the level of initial cognitive processing. However, the development of deep reflection, critical thinking, and meaningful knowledge construction remains dependent on human facilitation. Similarly, while AI enhances communication responsiveness, it cannot fully replicate the relational, emotional, and interpersonal qualities that constitute authentic social presence in learning

environments. The most significant transformation occurs in instructional presence, where educators shift from information transmitters to designers of learning experiences and ethical stewards of AI integration.

These findings affirm that meaningful AI-mediated learning requires a balanced synergy between technological innovation and pedagogical intentionality. AI should function as an enabling system that strengthens access and efficiency, while educators retain responsibility for reflection, relational engagement, and contextual judgment. Therefore, reimagining human presence in AI-mediated environments calls for a human-centered approach that positions technology as a supportive tool rather than a replacement for human agency. Future research is recommended to empirically test the proposed human-centered AI learning framework in diverse educational contexts, particularly in measuring its impact on student engagement, critical thinking, and social connectedness.

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