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Educators' Perceptions and Reflections on a Hybrid International Webinar on Artificial Intelligence and Deep Learning in Education

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Abstract
Rapid educational transformation driven by pedagogical reform and digital advancement has increased demands for educators to adapt their professional practice. In Indonesia, the introduction of deep learning as a pedagogical orientation alongside the expanding use of Artificial Intelligence has created a growing need for professional learning that connects emerging educational developments with practice. This community engagement initiative addressed this need through an accessible professional learning opportunity delivered via a hybrid international webinar integrating global perspectives with national educational priorities. The program combined onsite and online participation and included three sessions focusing on teacher professionalism, deep learning as a meaningful pedagogical orientation, and the pedagogical use of Artificial Intelligence. Participant feedback was gathered through a post-activity reflection survey consisting of closed-ended and open-ended items, with responses examined using descriptive and thematic approaches. Participant responses indicated high perceived relevance and professional value of the webinar: 69.3% strongly agreed that the content was relevant to their professional needs, while 70.1% strongly agreed that the activity provided new perspectives, skills, and insights. Open-ended reflections highlighted the importance of continuous professional development, meaningful and student-centered learning, and the responsible pedagogical use of Artificial Intelligence. Participants also reflected on international educational perspectives in relation to their own professional contexts. These findings suggest that structured academic webinars can provide an accessible initial professional learning opportunity for educators engaging with emerging pedagogical and technological development.

Keywords: Artificial intelligence in education; Community engagement; Deep learning pedagogy.

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Introduction

Educational systems worldwide are undergoing significant transformation in response to rapid technological advancement, changing societal expectations, and increasingly complex competency demands (OECD., 2020; UNESCO., 2021). These developments have placed growing expectations on educators to continuously adapt their professional knowledge and instructional practices. Teacher professionalism is therefore increasingly understood not only in terms of subject-matter expertise but also through pedagogical competence, ethical responsibility, responsiveness to educational change, and sustained professional learning (Avalos, 2011; Darling-Hammond & Bransford, 2005). Continuous professional development is particularly important when educators are required to interpret emerging policies and technologies and translate them into meaningful practices within their own educational contexts.

Indonesia was entering an important period of educational transition when this community engagement initiative was conducted. Pembelajaran Mendalam, or deep learning, was being introduced nationally as a pedagogical approach emphasizing learning that is mindful, meaningful, and joyful. The approach places greater emphasis on active engagement, conceptual understanding, reflection, and the

application of knowledge in relevant contexts rather than on the transmission of information alone (Kemendikdasmen, 2025b). In June 2025, the Ministry of Primary and Secondary Education explicitly emphasized the need to strengthen teachers' competence in implementing deep learning as part of efforts to improve the quality of classroom learning (Kemendikdasmen, 2025c). The initiative reported in this study was conducted during this early stage of policy transition, before the formal enactment of Permendikdasmen No. 13 of 2025, which subsequently reinforced deep learning within the national curriculum framework (Kemendikdasmen, 2025a).

The pedagogical implications of this transition extend beyond familiarity with a new policy term. Educators are increasingly expected to design learning experiences that encourage students to engage actively with knowledge, connect concepts with meaningful contexts, reflect on their learning, and develop competencies that can be applied beyond routine classroom tasks. These expectations are consistent with broader perspectives on deep learning and student engagement that emphasize participation, meaningful knowledge construction, and the development of transferable competencies (Fredricks et al., 2016; Fullan et al., 2018). Such a shift requires educators to interpret pedagogical principles and consider how they can be translated into instructional design, classroom interaction, and assessment. Without opportunities for professional learning and reflection, emerging pedagogical directions may remain primarily conceptual rather than becoming meaningfully connected to professional practice.

Alongside this pedagogical transition, the rapid expansion of Artificial Intelligence (AI), particularly generative AI and Large Language Models, has introduced new possibilities as well as new professional demands for educators. AI-based technologies can support aspects of educational practice such as instructional planning, resource development, differentiated learning, feedback, and access to information. However, meaningful educational integration requires more than familiarity with digital tools. Educators also need to understand the capabilities and limitations of AI, make pedagogically appropriate decisions about its use, exercise professional judgment, and consider ethical issues associated with technology-supported teaching and learning (Brandão et al., 2024; Miao & Cukurova, 2024; Sperling et al., 2024). These requirements reinforce the view that technological knowledge needs to be connected with pedagogical reasoning and professional practice rather than treated as an isolated technical competence (Mishra & Koehler, 2006).

Recent scholarship further demonstrates why professional learning has become increasingly important in the context of AI. A scoping review by Sperling et al. (2024) found that AI literacy has rapidly emerged as an educational concern, while its relationship with teachers' professional knowledge remains insufficiently developed within teacher education. Similarly, UNESCO's *AI Competency Framework for Teachers* identifies five interconnected dimensions of competence: a human-centred mindset, ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning (Miao & Cukurova, 2024). Literature focusing specifically on generative AI also emphasizes that professional development should address not only what AI tools can do but also their limitations, ethical implications, and pedagogical value (Brandão et al., 2024). Together, these perspectives indicate that educators require opportunities to critically engage with AI as part of their professional practice rather than approaching its adoption as a purely technological process.

The simultaneous emergence of these pedagogical and technological developments creates a need for professional learning opportunities that are accessible, timely, and responsive to changing educational demands. Online and hybrid formats can provide particular advantages when professional learning needs to reach educators across different geographical locations. Research on online teacher professional development highlights the importance of flexibility, relevance to professional needs, structured learning activities, reflection, interaction, and appropriate facilitation in supporting productive professional learning experiences (Bragg et al., 2021; Dille & Røkenes, 2021; Meyer et al., 2023; Philipsen et al., 2019). Webinar-based professional development can also provide timely access to emerging professional knowledge for geographically dispersed educators, particularly when rapid educational changes require opportunities for initial orientation and discussion (Shin et al., 2022). Accordingly, a hybrid webinar can function as an accessible entry point into professional learning, although such a short-format activity should not be regarded as equivalent to sustained professional development or as sufficient evidence of measurable competence gains.

In response to this context, Universitas Maritim Raja Ali Haji collaborated with the Fabrication Laboratory Education at Universitas Pendidikan Indonesia and the Leading University Project for International Cooperation at Sogang University, South Korea, to organize an international webinar addressing Artificial Intelligence and deep learning in education. The international dimension was intended to connect Indonesia's emerging educational priorities with perspectives from another educational context. The program combined discussion of teacher professionalism in South Korea with sessions addressing deep learning and the pedagogical use of Artificial Intelligence, thereby providing participants with opportunities to consider both international perspectives and issues directly relevant to ongoing educational developments

in Indonesia. Rather than positioning practices from another country as models for direct replication, the international perspective was used as a comparative point through which participants could reflect on professional development and educational change within their own contexts.

The webinar was therefore conceptualized as an initial professional learning opportunity rather than a comprehensive intervention designed to produce or measure changes in competence. Its hybrid format enabled onsite participation while extending access to educators from different locations, and its three-session structure connected teacher professionalism, deep learning, and Artificial Intelligence within a common discussion of contemporary educational change. Accordingly, this community engagement initiative aimed to provide educators with an accessible professional learning opportunity to engage with the principles of deep learning, examine the pedagogical role of Artificial Intelligence in supporting meaningful learning, and reflect on how emerging pedagogical and technological developments may inform their professional practice.

Method

Program Design

This community engagement program was designed as an initial structured professional learning activity for educators engaging with emerging pedagogical and technological developments. The webinar was conducted on June 19, 2025, in a hybrid format that combined onsite participation in Bandung with online attendance to broaden access for educators from multiple regions. A total of 15 participants attended the session onsite, while other participants joined virtually. The program was implemented through institutional collaboration between Universitas Maritim Raja Ali Haji, the Fabrication Laboratory Education (FabLab Edu) at Universitas Pendidikan Indonesia, and the Leading University Project for International Cooperation (LUPIC) at Sogang University, South Korea.

The webinar was organized into three sessions, each followed by a question and answer segment that enabled participants to engage directly with the speakers. The first session discussed teacher professionalism within the context of educational advancement in South Korea, introducing participants to international perspectives on professional responsibility and continuous development. The second session focused on the principles of deep learning, particularly the design of meaningful learning experiences and their implications for classroom practice. The third session examined the pedagogical use of Artificial Intelligence in education, addressing how emerging technologies may assist educators in supporting instructional processes and student learning. Participant engagement was evident during the discussion segments, where questions and comments reflected efforts to connect the presented ideas with participants' professional contexts. At the end of the webinar, participants were invited to complete a reflective feedback form intended to capture their responses to the program and the perceived relevance of the topics discussed.

Participants

Participants registered through an open-enrollment process that was accessible to members of the broader education community from multiple provinces across Indonesia. The webinar was therefore not restricted to in-service teachers and also attracted prospective teachers, lecturers, and education supervisors. Of the 403 registered participants, 244 completed the post-activity reflection survey and were included in the analysis, representing a response rate of 60.5%. Teachers constituted the largest professional group (63.1%), followed by prospective teachers (21.3%), lecturers (14.3%), and education supervisors (1.3%). Given this diverse professional composition, the term "educators" is used throughout the manuscript when referring collectively to the participants and the aggregated findings. The distribution of participants by professional background is presented in Table 1.

Table 1. Distribution of Participants by Professional Background

Professional Background	Percentage (%)
Teachers	63.1
Prospective Teachers	21.3
Lecturers	14.3
Education Supervisors	1.3

Data Collection

Participant responses were collected immediately after the webinar through a voluntary online post-activity reflection survey. Survey-based approaches are commonly used to document participant perceptions and evaluate educational activities (Creswell, 2012; Dillman et al., 2014). Of the 403 registered participants,

244 completed the survey, representing a response rate of 60.5%. The survey was designed as a program reflection and evaluation instrument to document participants' perceptions of the relevance and professional value of the webinar rather than as a pre–post assessment of changes in competence.

The instrument combined closed-ended and open-ended items to capture complementary aspects of participants' responses. Two closed-ended statements examined whether the webinar content was perceived as relevant to participants' professional needs and whether the activity provided new perspectives, skills, and insights. Responses were recorded using a four-point Likert-type scale ranging from strongly disagree to strongly agree. Three open-ended questions invited participants to identify aspects of each webinar session that they considered most engaging or meaningful. These questions corresponded to the three main topics addressed during the program: teacher professionalism, deep learning as a pedagogical orientation, and the educational use of Artificial Intelligence. Participants provided their names for administrative purposes related to certificate issuance; however, responses were analyzed and reported in aggregate form.

Data Analysis

Responses to the closed-ended items were analyzed descriptively using frequencies and percentages to identify overall patterns in participants' perceptions of webinar relevance and professional value. Because the evaluation was conducted only after the activity, these responses were interpreted as indicators of participants' post-activity perceptions rather than as evidence of measured changes in competence.

Open-ended responses were examined using a thematic approach informed by Braun & Clarke (2006). The analysis focused on recurring patterns of meaning in participants' reflections across the three webinar sessions. Responses were organized according to the session to which they referred and examined for recurrent ideas concerning teacher professionalism, meaningful learning, and the pedagogical use of Artificial Intelligence. The resulting patterns were used to complement the descriptive survey findings and to provide a more contextualized account of how participants interpreted the webinar content in relation to their professional roles.

Result and Discussion

Program Implementation

The webinar was conducted in a hybrid format that integrated onsite participation with synchronous virtual attendance, enabling educators from multiple regions to engage in the activity. The program began with an opening session designed to support interaction between in-person and online participants, followed by three presentation sessions addressing teacher professionalism from an international perspective, deep learning as a pedagogical approach, and the use of artificial intelligence in educational practice. Each session incorporated a discussion segment that allowed participants to relate the presented ideas to their professional contexts.

The structured sequence of activities created an accessible professional learning space while exposing participants to emerging educational perspectives. Research on online and hybrid professional development similarly highlights flexibility, structured engagement, and access across geographical locations as important features of professional learning (Bragg et al., 2021; Dille & Røkenes, 2021; Shin et al., 2022).



Figure 1. Implementation of the Hybrid Webinar

Participant Responses: Quantitative Overview

A total of 244 participants completed the post-webinar reflection form. Responses to the closed-ended items indicate a consistently high level of agreement regarding both the relevance of the webinar content and its perceived contribution to professional learning (Figure 2). This pattern suggests that the themes presented during the activity corresponded with participants' professional needs amid ongoing educational change.

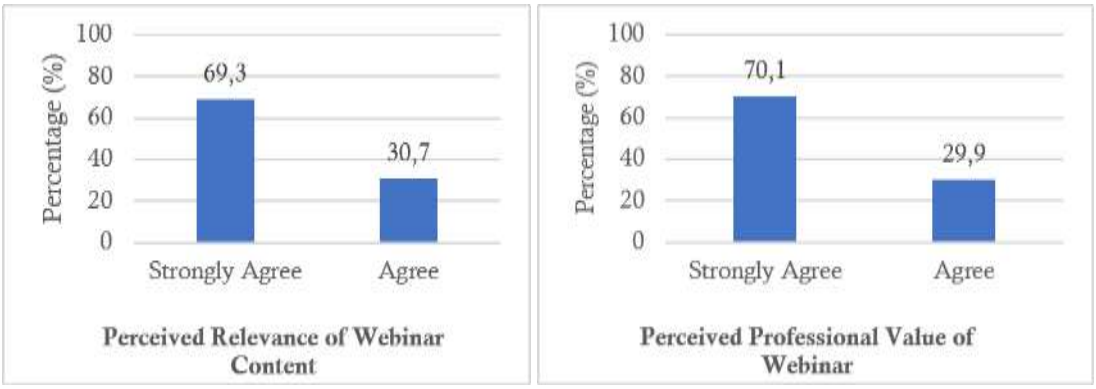


Figure 2. Participants' Perceptions of Webinar Relevance and Professional Value

As shown in Figure 2(a), 69.3% of participants strongly agreed and 30.7% agreed that the webinar content was relevant to their professional needs. Similarly, Figure 2(b) shows that 70.1% strongly agreed and 29.9% agreed that the webinar provided new perspectives, skills, and insights. These uniformly positive responses indicate that participants perceived the activity as relevant and professionally valuable at the time of the post-activity evaluation. However, because the survey captured participants' perceptions immediately after the webinar, the findings should be interpreted as indicators of perceived relevance and professional value rather than as evidence of measured improvement in competence. Perceived relevance is an important characteristic of professional learning experiences because participants are more likely to engage with activities that connect with their professional needs and practice (Desimone, 2009; Guskey, 2002)

Participant Reflections Across Webinar Sessions

Analysis of the open-ended responses identified several recurring themes across the three webinar sessions, illustrating how participants interpreted the content in relation to their professional roles.

Session 1: Teacher Professionalism from an International Perspective

Participant reflections frequently emphasized structured professional development, collaboration among educators, and institutional support as important features of teacher professionalism in the South Korean context. Participants associated these features with sustained professional growth and educators' capacity to respond to changing educational demands. This emphasis is consistent with professional development literature that positions continuous learning, collaboration, and coherence with professional practice as important conditions for teacher development (Avalos, 2011; Desimone, 2009).

The emphasis on collaboration and institutional support also situates participants' reflections within a broader understanding of professional development as a context-dependent and socially supported process. Sancar et al. (2021) identify context, collaboration, organizational support, and responsiveness to educational reform as interconnected elements of effective teacher professional development. Similarly, De Jong et al. (2022) show that professional learning through collaboration depends not only on opportunities to work together but also on organizational, process, and contextual conditions that enable teachers to examine teaching and learning critically. These perspectives help explain why participants did not describe teacher professionalism solely in terms of individual competence, but also referred to collaborative and institutional conditions surrounding professional practice.

Participants' reflections also included comparisons between the international perspective presented during the session and their own professional contexts. Such comparisons were expressed as points for reflection rather than as calls to replicate practices from another education system directly. This reflective dimension is consistent with Chung (2023), who highlights dialogic reflection and supportive conditions as important components of professional learning. In the present activity, exposure to an alternative educational context therefore provided a reference point for professional reflection rather than a model to be transferred uncritically. A small number of participants, however, reported difficulty fully engaging with the session because of language differences, indicating that linguistic accessibility remains an important consideration when international perspectives are incorporated into professional learning activities.

Session 2: Deep Learning as a Meaningful Pedagogical Orientation

Responses to the deep learning session largely centered on learning as a conscious and meaningful process rather than a procedural one. Participants frequently referred to the principles of mindful, meaningful, and joyful learning and related these principles to more holistic and student-centered educational experiences. Several reflections distinguished deep learning as a pedagogical orientation from technological interpretations of the term, indicating that this conceptual distinction was particularly salient in participants'

responses. Participants also emphasized engagement, critical thinking, and contextual understanding as important characteristics of meaningful learning.

These reflections are consistent with broader evidence that meaningful learning is supported when instruction builds on learners' prior knowledge, promotes conceptual understanding, and engages students with relevant and problem-oriented learning experiences (Darling-Hammond et al., 2020). From the perspective of classroom practice, Cáceres et al. (2020) similarly found that teachers associated the development of critical thinking with the use of core disciplinary concepts and opportunities for students to make sense of real-world phenomena. These connections provide a useful context for interpreting participants' emphasis on student-centered and contextual learning. They should not, however, be taken as evidence that the webinar produced measurable changes in participants' pedagogical competence; rather, they identify the aspects of deep learning that participants considered professionally meaningful following the session.

Session 3: Engaging with Artificial Intelligence in Education

Feedback from the Artificial Intelligence session predominantly highlighted the perceived practical potential of AI to support instructional processes. Participants frequently referred to its usefulness in preparing learning materials, supporting differentiated instruction, and improving efficiency in routine tasks. At the same time, their reflections emphasized that AI should function as a supportive resource rather than replace educators' professional judgment and instructional responsibilities. Ethical considerations and digital literacy also appeared repeatedly in the responses, indicating that responsible technology use was a salient concern for participants.

This emphasis is consistent with current approaches to AI in education that place human agency, ethical judgment, and pedagogical purpose at the center of technology integration. The UNESCO AI Competency Framework for Teachers, for example, positions a human-centred mindset, AI ethics, and AI pedagogy as interconnected dimensions of educators' professional competence (Miao & Cukurova, 2024). Similarly, Chauncey & McKenna (2023) emphasize that the educational use of AI chatbots requires ethical and responsible pedagogical design rather than uncritical adoption of the technology. Within the present evaluation, these responses indicate the considerations participants regarded as important when engaging with AI in education. They should not be interpreted as evidence that participants developed or improved AI-related competence as a result of the webinar.

Recent research on AI-focused professional development further indicates that exposure to AI concepts alone may not be sufficient for meaningful pedagogical integration. Ding et al. (2024), for example, found that case-based professional development supported teachers' engagement with AI literacy and pedagogical integration, while translating newly acquired knowledge into practice remained more challenging. Tan et al. (2025) similarly identify a continuing need for professional development that addresses pedagogical applications of AI alongside technological and ethical challenges. These findings support the view that short-format activities such as the present webinar are best understood as an initial orientation that can be extended through more sustained and practice-oriented professional learning.

Across the three sessions, participants connected teacher professionalism, deep learning, and Artificial Intelligence with different dimensions of contemporary educational change and professional practice. Their responses emphasized professional development and institutional support, meaningful and student-centered learning, and the pedagogically responsible use of AI. The findings therefore primarily document the issues participants considered relevant to their professional contexts following the webinar, rather than changes in professional knowledge or competence. Within this evaluative scope, short-format academic webinars can provide an accessible point of entry for educators encountering emerging pedagogical and technological issues, particularly when internationally informed perspectives are connected with concerns relevant to local educational practice (Shin et al., 2022).

Scope and Limitations

The evaluation design limits the conclusions that can be drawn from the findings. Participant responses were collected only after the webinar, without baseline or pre–post measures of knowledge, skills, or professional competence. The quantitative findings therefore describe participants' perceived relevance and professional value of the activity at the time of evaluation, while the open-ended responses indicate the ideas and issues they chose to emphasize in reflecting on the three sessions. These data do not provide evidence of change in participants' knowledge, awareness, skills, or competence.

The evaluation also relied on self-reported responses and did not include performance-based tasks, observations of professional practice, or follow-up data on the subsequent use of ideas introduced during the webinar. The open-enrollment format resulted in a participant group that included teachers, prospective teachers, lecturers, and education supervisors; consequently, the aggregated findings should not be

generalized specifically to in-service teachers. A more comprehensive evaluation of similar programs would require measures aligned with the intended learning outcomes before and after participation, complemented by performance-based evidence and follow-up data capable of examining whether professional learning is subsequently reflected in educational practice.

Conclusion

The hybrid international webinar provided an accessible professional learning space for educators to engage with emerging perspectives on teacher professionalism, deep learning, and Artificial Intelligence in education. Post-activity responses indicated that participants perceived the webinar content as relevant to their professional needs and valued the new perspectives, skills, and insights presented during the activity. Open-ended reflections emphasized meaningful and student-centered learning, continuous professional development, responsible uses of Artificial Intelligence, and the relevance of considering international educational perspectives within local professional contexts.

These findings should be understood as participants' post-activity perceptions and reflections rather than as evidence of measured improvement in professional competence. Within this scope, structured academic webinars may function as useful initial professional learning opportunities by providing timely and accessible engagement with emerging pedagogical and technological issues. Sustained professional development and evaluations incorporating pre–post, performance-based, and follow-up measures would be needed to determine whether such learning opportunities subsequently contribute to changes in competence or professional practice.

Author Declarations

Author Contributions

Metta Liana: Conceptualization, methodology, writing—original draft preparation, writing—review and editing. Asep Kadarohman: Conceptualization, methodology, supervision. Won Koo Lee: Conceptualization, program implementation. Sun Yeoul Lee: Conceptualization, program implementation. Triannisa Rahmawati: Data collection, data analysis. Harianti: Program implementation.

Conflict of Interest

The authors declare that there are no conflicts of interest related to the conduct, analysis, or publication of this community engagement program.

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Use of Artificial Intelligence

Generative Artificial Intelligence tools were used during manuscript preparation to assist with language refinement, academic wording, and the organization of selected sections. All AI-assisted outputs were critically reviewed, revised, and verified by the authors. The authors take full responsibility for the accuracy, integrity, interpretation, and final content of the manuscript. Generative AI was not used to generate, modify, or analyze the empirical data reported in this study.

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