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TRAINING TO ENHANCE TUTOR CAPACITY THROUGH THE USE OF ARTIFICIAL INTELLIGENCE (AI) IN THE DEVELOPMENT OF TEACHING MATERIALS FOR UNIVERSITY PROFESSORS AND SCHOOL TEACHERS IN SOLOK, WEST SUMATRA

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Abstract
The rapid development of Artificial Intelligence (AI) opens up significant opportunities for transforming the world of education, particularly in terms of the efficiency of creating instructional materials. However, many educators in rural areas, such as in Solok, West Sumatra, have not yet made optimal use of this technology due to limited digital literacy. This community service initiative aims to enhance the capacity of instructors (university lecturers and school teachers) in the City and Regency of Solok to design, create, and develop AI-based interactive teaching materials. The approach involves hands-on workshops combined with intensive mentoring. The AI applications covered in the training included ChatGPT for developing syllabi and text-based materials, Gamma.app for visual presentations, and Quizizz AI for learning assessment. The target audience consisted of 45 participants, comprising university lecturers and high school teachers in Solok. Evaluation results from pre- and post-tests showed a 64% increase in participants' theoretical understanding and a 78% increase in practical skills. Additionally, 92% of participants successfully produced AI-based instructional modules ready for implementation. This initiative concluded that AI integration has proven capable of reducing the time required to produce instructional materials while simultaneously improving the visual quality and diversity of educators' instructional content.

Keywords: Artificial Intelligence, Instructional Materials, Capacity Building, Educators, Solok

Abstrak
Perkembangan Artificial Intelligence (AI) yang pesat membuka peluang besar dalam transformasi dunia pendidikan, khususnya dalam efisiensi pembuatan bahan ajar. Namun, banyak pendidik di daerah, seperti di Solok, Sumatera Barat, yang belum memanfaatkan teknologi ini secara optimal karena keterbatasan literasi digital. Kegiatan pengabdian kepada masyarakat ini bertujuan untuk meningkatkan kapasitas tutor (dosen dan guru) di Kota dan Kabupaten Solok dalam merancang, menyusun, dan mengembangkan bahan ajar interaktif berbasis AI. Metode yang digunakan adalah pelatihan berbasis praktik (hands-on workshop) yang dikombinasikan dengan

pendampingan intensif (mentoring). Aplikasi AI yang dilatihkan meliputi ChatGPT untuk penyusunan silabus dan materi teks, Gamma.app untuk presentasi visual, dan Quizizz AI untuk evaluasi pembelajaran. Khalayak sasaran berjumlah 45 peserta yang terdiri dari dosen perguruan tinggi dan guru sekolah menengah di Solok. Hasil evaluasi melalui pre-test dan post-test menunjukkan peningkatan pemahaman teoretis peserta sebesar 64% dan keterampilan praktis sebesar 78%. Selain itu, sebanyak 92% peserta berhasil memproduksi modul ajar berbasis AI yang siap diimplementasikan. Kegiatan ini menyimpulkan bahwa integrasi AI terbukti mampu memangkas waktu produksi bahan ajar sekaligus meningkatkan kualitas visual dan keragaman konten instruksional pendidik.
Kata kunci: *Artificial Intelligence, Bahan Ajar, Peningkatan Kapasitas, Pendidik, Solok*

INTRODUCTION

Advances in digital technology have spurred the emergence of a new paradigm in education that positions artificial intelligence (*Artificial Intelligence* or AI) as one of the most transformative technologies of the 21st century. This transformation is not only changing the way students acquire information, but also altering how educators design, manage, and evaluate the learning process. AI enables the automation of various academic activities that previously required significant time and effort—ranging from the creation of instructional materials, the development of learning media, and the design of assessments, to the analysis of learning outcomes—all performed more quickly and accurately (UNESCO, 2023). These changes demonstrate that AI is no longer merely a technological innovation but has evolved into a strategic tool for supporting the continuous improvement of educational quality.

The emergence of *Generative Artificial Intelligence* (Generative AI) technology, particularly that based on *Large Language Models* (LLMs), is further accelerating this transformation. Unlike conventional digital technologies, which function solely as media for storing and presenting information, Generative AI is capable of generating new content in the form of text, images, presentations, videos, or programming code based on instructions provided by the user (*prompt*). Platforms such as ChatGPT, Gemini, Claude, Microsoft Copilot, Canva AI, Gamma, NotebookLM, and various other educational AI applications provide educators with the opportunity to develop instructional materials in a more creative and personalized manner, tailored to the characteristics of their students. Consequently, AI is no longer viewed as a simple tool but has become a *collaborative partner* that supports the learning planning process more efficiently (Holmes et al., 2022).

In the context of higher education as well as elementary and secondary education, the use of AI offers various significant benefits. One of the primary benefits is the increased efficiency of teachers and professors in developing instructional materials. Until now, the preparation of Lesson Plans (RPP), teaching modules, presentation materials, student worksheets, and assessment instruments has required a lengthy process because it had to be done manually. The use of AI enables all these processes to be completed in a much shorter time without compromising the quality of the academic content. In fact, AI can generate various alternatives for more contextual learning designs through the integration of text, visual illustrations, infographics, instructional videos, and assessments based on *higher-order thinking skills* (Hwang & Tu, 2021). This development provides educators

with the opportunity to allocate more time to pedagogical activities, such as guiding students, providing feedback, and fostering meaningful learning interactions.

In addition to improving efficiency, AI also supports the implementation of *student-centered learning*. AI technology can generate learning materials tailored to individual ability levels, interests, and learning needs, thereby supporting the practice of *personalized learning*. This approach is highly relevant to the characteristics of Generation Z and Generation Alpha, who are growing up in a digital environment and prefer learning that is more visual, interactive, adaptive, and technology-based (OECD, 2021). Therefore, the use of AI in the development of instructional materials not only increases teacher productivity but also contributes to improving the quality of students' learning experiences.

Nevertheless, various international reports indicate that the adoption of AI in education still faces numerous challenges. UNESCO (2023) emphasizes that the successful implementation of AI depends not only on the availability of technological devices but is also influenced by educators' digital competencies, organizational readiness, institutional policies, and ethical considerations in the use of AI. Many teachers and professors still struggle to understand how AI works, select platforms that align with learning needs, and utilize AI outputs critically and responsibly. This situation underscores that enhancing human competencies remains a key factor in the success of digital transformation in education.

This phenomenon is also evident in Indonesia. Although the government continues to promote the digitization of education through various policies—such as the implementation of the Merdeka Curriculum, the Merdeka Mengajar Platform, and the strengthening of national digital literacy—the level of AI adoption by educators still shows significant disparities across regions. Regions outside major economic hubs still face various obstacles, including limited access to technology training, low AI literacy, and a lack of guidance in integrating AI into daily teaching practices (Ministry of Education, Culture, Research, and Technology, 2024). As a result, many teachers and professors are still unable to make optimal use of AI technology, even though these platforms are available for free.

This situation is also evident in the City and Regency of Solok, West Sumatra. Based on the results of a preliminary study conducted through field observations and interviews with the executive board of the Indonesian Teachers Association (IGI) in Solok, university lecturers, and several partner teachers, it was found that the majority of educators still develop instructional materials using conventional methods. The process of developing instructional materials generally involves drawing references from printed books or internet search engines using the *copy-paste* technique, which is then slightly modified as needed. This approach results in instructional materials that tend to be uniform, lack innovation, and fail to accommodate the demands of 21st-century learning, which requires creativity, collaboration, communication, and critical thinking skills.

The results of the *training needs assessment* indicate that the low adoption of AI among teachers and faculty is influenced by several key factors. First, digital literacy remains

low, particularly regarding an understanding of the various AI platforms that can be utilized for educational purposes. Many educators are familiar with AI only through ChatGPT, while other applications such as NotebookLM, Gamma AI, Canva AI, MagicSchool AI, Diffit AI, and Copilot have not yet been fully utilized. Second, most participants lack *prompt engineering* skills—the ability to craft clear, systematic, and contextual instructions so that AI can generate outputs aligned with learning needs. In fact, the quality of AI-generated results is heavily determined by the quality of the *prompt* crafted by the user (Mollick, 2024). Third, there remains a lack of training programs that integrate AI theory with hands-on practice in developing instructional materials, making it difficult for participants to apply the technology independently after the training concludes.

This low level of AI proficiency directly impacts the quality of the instructional materials produced. Most instructional materials remain text-based, make insufficient use of visual or multimedia elements, and do not yet accommodate differentiated instruction—one of the key characteristics of the Merdeka Curriculum. Yet today's students are part of a digital generation accustomed to quickly accessing information through visual media, interactive videos, digital simulations, and various online learning platforms. Consequently, instructional materials that remain dominated by lengthy text and conventional delivery methods tend to be less effective at sustaining attention, boosting learning motivation, or developing students' *higher-order thinking skills* (Mayer, 2021). This situation indicates that digital transformation in education requires more than just providing technological infrastructure; it must also be accompanied by capacity-building for the human resources managing it.

Various studies over the past five years have shown that the use of AI has a positive impact on improving the quality of learning when used appropriately. Holmes et al. (2022) explain that AI has the potential to support personalized learning, improve the efficiency of academic administration, and help teachers produce learning materials that are more adaptable to students' needs. Research by Hwang and Tu (2021) also indicates that integrating AI into learning can boost teachers' creativity in developing digital learning materials while simultaneously strengthening student engagement throughout the learning process. Similarly, Zawacki-Richter et al. (2019) found that the implementation of AI in education offers significant opportunities to improve the quality of learning through the automation of administrative tasks, *learning analytics*, and the provision of faster feedback to students.

In Indonesia, various studies have also shown similar trends. A study conducted by Suyanta et al. (2024) indicates that training teachers in the use of AI can improve their digital competencies, creativity in developing instructional materials, and confidence in implementing technology in the learning process. Another study by Rahman et al. (2024) revealed that the use of generative AI platforms helps teachers create instructional modules that are more systematic, contextual, and aligned with the learning outcomes set forth in the Merdeka Curriculum. Furthermore, Mollick's (2024) study emphasizes that the successful utilization of AI does not depend solely on the sophistication of the

technology, but rather on the user's ability to design effective *prompts* that yield accurate, relevant, and academically appropriate outputs.

Nevertheless, the results of the literature review indicate that most previous studies have focused on the effectiveness of AI use in classroom learning processes or on teachers' perceptions of AI use. Research specifically aimed at developing training models to enhance tutors' capacity in *prompt engineering*, the integrated use of various AI platforms, and guidance on the development of AI-based instructional materials remains relatively limited. Furthermore, most studies have been conducted in major cities or universities with relatively high levels of technological readiness. Studies on the implementation of AI training for teachers and faculty in developing regions, particularly in West Sumatra, remain scarce. This situation highlights a *research gap* that needs to be addressed through community service activities that not only provide theoretical training but also practical guidance until participants are able to independently produce AI-based learning materials.

Given these circumstances, this Community Service (PkM) program was designed as a strategic intervention to enhance the digital competencies of teachers and lecturers through training on the use of Artificial Intelligence in the development of instructional materials. This program adopts a *learning by doing* approach, in which participants not only gain a conceptual understanding of AI developments in education but also directly practice using various AI platforms to create learning tools tailored to the needs of each subject. This approach was chosen because various studies have shown that practice-based training results in higher skill retention rates compared to training that consists solely of lectures or demonstrations (Darling-Hammond et al., 2020).

The training program is designed in phases through workshops, guided practice, group discussions, case studies, and individual mentoring. Training materials cover an introduction to the basic concepts of Artificial Intelligence in education, the ethics of AI use, *prompt engineering* techniques, the use of various generative AI applications to develop instructional modules, presentation media, infographics, educational videos, and assessment tools, as well as techniques for evaluating the quality of AI outputs. With this approach, participants are expected not only to become technology users but also to serve as *instructional designers* capable of utilizing AI critically, creatively, and responsibly.

The program's advantage over similar training initiatives lies in its integration of AI literacy enhancement, mastery of *prompt engineering*, development of learning products, and implementation support within participants' work environments. The program does not end with the delivery of course content but continues with a mentoring process so that each participant produces tangible outcomes—such as instructional modules, presentation materials, interactive learning media, or AI-based assessment tools—ready for use in educational activities. This approach is expected to foster more sustainable professional behavioral changes compared to training that is solely focused on knowledge transfer.

From an institutional perspective, this initiative also supports the national agenda for accelerating the digital transformation of education, as outlined in various policies of the

Ministry of Education, Culture, Research, and Technology, as well as UNESCO's recommendations regarding the use of human-centered AI. Teachers and lecturers are no longer viewed as those who will be replaced by AI, but rather as learning facilitators capable of collaborating with technology to improve the quality of educational services. In this paradigm, AI functions as a tool that strengthens educators' professional competencies, while pedagogical decisions remain with teachers and lecturers as the primary actors in the learning process (UNESCO, 2023).

Based on this description, this Community Service initiative is of high urgency as it addresses the real needs of teachers and lecturers to enhance their competencies in utilizing Artificial Intelligence for the development of instructional materials. The novelty of this program lies in the integration of *prompt engineering* training, the comprehensive use of various generative AI platforms, practice-based mentoring, and the development of learning products ready for implementation in the classroom. Thus, this initiative is expected not only to enhance participants' digital literacy but also to bring about tangible improvements in the quality of instructional materials, the effectiveness of the learning process, and the creation of a more innovative, adaptive, and sustainable educational ecosystem in the City and Regency of Solok, West Sumatra.

METHOD

This community service activity was conducted using a hands-on workshop approach combined with online post-training mentoring. There were 45 training participants, consisting of 15 faculty members from universities in Solok and 30 teachers from junior high, senior high, and vocational high schools in the greater Solok area. The implementation of the activity was divided into three main systematic phases:

1. Preparation Phase (Needs Analysis): Coordinating with strategic partners (the Education Office and teachers' associations), developing a guide module for using AI applications, and conducting a pre-test to assess participants' initial understanding of artificial intelligence technology.
2. Implementation Phase (Workshop & Practice): Presenting material on the basic concepts of AI in education, introducing prompt engineering, and providing guided practice in creating text modules (using ChatGPT/Claude), visual presentation media (using Gamma.app/SlidesAI), and interactive assessment tools (using Quizizz AI/Conker).
3. Evaluation and Mentoring Phase: Two weeks of self-directed support via a WhatsApp group to refine instructional materials, administration of a post-test, and completion of a program satisfaction questionnaire.

RESULTS AND DISCUSSION

The training session was very dynamic and was met with great enthusiasm from the participants. Based on the pre-test results, it was found that only about 18% of the participants had ever used generative AI for teaching purposes, and even then, their use was limited to searching for basic information on ChatGPT without using proper prompting techniques. Most participants were concerned that the use of AI violates the academic code of ethics.

Figure 1. Training Activities

The core phase of the community service program focused on correcting participants' misconceptions regarding the role of Artificial Intelligence (AI) in education. Initial observations and pre-training discussions revealed that many teachers and lecturers perceived AI as a technology that could potentially replace educators rather than support their professional responsibilities. Such perceptions are consistent with previous studies indicating that educators often exhibit resistance toward emerging technologies due to concerns about professional displacement and limited digital literacy (UNESCO, 2023). Consequently, the training emphasized that AI should be viewed as a creative assistant or instructional co-pilot that enhances teachers' productivity while preserving their central pedagogical role.

To establish this perspective, participants were introduced to the principles of prompt engineering, a fundamental competency for maximizing the effectiveness of Generative Artificial Intelligence. Rather than providing general or ambiguous instructions, participants learned to construct structured prompts using the Context–Role–Task–Constraint (CRTC) framework. This framework enables users to communicate with AI systems more precisely by clearly specifying the instructional context, defining the AI's role, describing the desired task, and outlining specific constraints or expected outputs.

For example, participants practiced prompts such as:

"Act as a senior curriculum expert in Indonesian senior high school mathematics implementing the Merdeka Curriculum. Develop an Achievement Flow (ATP) for Grade X Statistics using the Contextual Teaching and Learning approach."

The outputs generated through this structured prompting technique demonstrated substantially higher quality than those produced through simple keyword searches or

conventional prompts. Participants recognized that the quality of AI-generated instructional materials depends largely on the quality of the prompts provided rather than on the AI platform itself. This finding supports Mollick (2024), who argues that effective interaction with generative AI requires users to develop prompt engineering competencies that combine pedagogical understanding with clear instructional communication.

Furthermore, participants were introduced to several AI-powered educational platforms, including ChatGPT, Gamma.app, Canva AI, Quizizz AI, and NotebookLM. Each platform was demonstrated according to its instructional strengths. Gamma.app was utilized for developing interactive presentation slides, Canva AI for designing visual learning materials and infographics, Quizizz AI for automatically generating formative assessments, and NotebookLM for organizing learning resources and summarizing academic references. This integrated approach allowed participants to understand that AI technologies should be selected according to instructional objectives rather than used indiscriminately.

The effectiveness of the training program was evaluated through pre-test and post-test assessments measuring four competency indicators: conceptual understanding of AI and academic ethics, prompt engineering skills, production of AI-assisted instructional materials, and AI-based assessment development. The results indicate substantial improvements across all competency domains.

Table 1. Participants' Competency Improvement Before and After the AI Training Program

COMPETENCY INDICATOR	MEAN PRE-TEST	MEAN POST-TEST	IMPROVEMENT
UNDERSTANDING OF AI CONCEPTS AND ACADEMIC ETHICS	48.5	82.0	69%
PROMPT ENGINEERING SKILLS	22.0	76.5	247%
DEVELOPMENT OF VISUAL LEARNING MATERIALS (GAMMA.APP/AI SLIDES)	35.0	85.0	143%
AI-BASED ASSESSMENT DEVELOPMENT (QUIZIZZ AI)	40.0	88.0	120%

The findings presented in Table 1 demonstrate a remarkable increase in participants' competencies following the training. The most significant improvement occurred in prompt engineering skills, which increased by 247%, indicating that participants' primary challenge was not technological operation but rather the ability to formulate precise and pedagogically meaningful instructions for AI systems. This finding corroborates Holmes et al. (2022), who emphasize that the educational value of artificial intelligence depends more on educators' instructional competencies than on technological sophistication alone.

The training also substantially enhanced participants' ability to produce digital instructional materials. Prior to the workshop, most participants required several hours or

even days to prepare classroom presentation slides. After completing the training, participants were capable of producing visually engaging instructional presentations through Gamma.app in less than five minutes while maintaining alignment with curriculum objectives and learning outcomes. Such improvements illustrate how AI can significantly reduce administrative workload and allow educators to devote more time to instructional planning, classroom interaction, and student mentoring (OECD, 2021)

The substantial improvement in participants' competencies demonstrates that systematic training accompanied by hands-on practice is an effective strategy for enhancing educators' digital literacy. Prior to the workshop, many participants perceived artificial intelligence merely as an advanced search engine or an automated writing tool with limited educational value. This perception gradually changed as participants engaged in guided practice and discovered that AI could function as an intelligent instructional partner capable of supporting curriculum planning, lesson preparation, instructional media development, and classroom assessment. Such changes indicate that professional development should not only focus on introducing technological tools but also foster educators' confidence and competence in integrating technology into authentic teaching practices. According to the Technology Acceptance Model (TAM), users are more likely to adopt a new technology when they perceive it as both useful and easy to use (Davis, 1989). The significant increase in post-training competency scores suggests that the workshop successfully enhanced both dimensions, thereby encouraging participants' willingness to incorporate AI into their professional practice.

The remarkable improvement in prompt engineering skills deserves particular attention because it represents the fundamental competency required for effective interaction with generative AI systems. Unlike traditional search engines that retrieve existing information, generative AI produces new content based on users' instructions. Consequently, the quality of AI-generated instructional materials depends heavily on the clarity, specificity, and pedagogical appropriateness of the prompts. Throughout the workshop, participants progressed from writing short and general instructions to constructing comprehensive prompts that specified curriculum standards, student characteristics, learning objectives, instructional approaches, expected outputs, and assessment criteria. This progression significantly improved the relevance and quality of AI-generated lesson plans, instructional presentations, worksheets, and assessment instruments. These findings are consistent with Mollick (2024), who emphasizes that prompt engineering should be considered a new professional literacy for educators working in AI-supported learning environments.

The training outcomes can also be interpreted through the framework of Technological Pedagogical Content Knowledge (TPACK), which emphasizes the integration of technological knowledge, pedagogical knowledge, and content knowledge in effective teaching (Mishra & Koehler, 2006). Before the workshop, participants generally possessed adequate pedagogical and subject-matter expertise but demonstrated limited technological competence related to AI applications. Following the training, participants showed considerable growth in technological knowledge while simultaneously learning how to integrate AI into pedagogically meaningful instructional activities. Rather than

using AI simply to generate text, participants learned to employ AI strategically to support curriculum alignment, instructional design, visual communication, formative assessment, and differentiated instruction. This integration reflects the development of a more balanced TPACK competency, enabling educators to utilize technology in ways that enhance rather than replace sound pedagogical practice.

Another important finding emerged during the two-week mentoring phase that followed the workshop. Participants were required to independently develop AI-assisted instructional products and submit them as professional portfolios. The mentoring results indicated that 41 out of 45 participants (91.1%) successfully completed and submitted digital teaching materials ready for classroom implementation. The submitted products included lesson modules, presentation slides, student worksheets, instructional videos, assessment instruments, interactive quizzes, and AI-assisted learning resources. This high completion rate demonstrates that participants were able to transfer the competencies acquired during the workshop into authentic educational products. It also indicates that sustained mentoring after formal training plays a critical role in supporting the practical application of newly acquired technological skills. Similar findings have been reported by Darling-Hammond et al. (2020), who argue that continuous coaching and follow-up activities significantly improve the long-term effectiveness of professional development programs.

Beyond competency development, participant satisfaction further reflected the success of the program. The post-training evaluation questionnaire produced an average satisfaction score of 4.75 out of 5.00, indicating a very high level of participant appreciation. Most respondents highlighted the practical orientation of the workshop, the immediate applicability of the training materials, the relevance of AI applications to classroom needs, and the individualized mentoring provided by the facilitators. Participants also expressed strong interest in attending advanced workshops focusing on specialized AI applications, including adaptive learning systems, AI-assisted educational research, automated academic writing support, and multimedia content generation. These responses suggest that educators recognize AI not as a temporary technological trend but as an essential component of future educational practice.

Figure 2. The training process

The sustainability of this community engagement program extends beyond the immediate training outcomes. Through collaboration with the Indonesian Teachers Association (IGI) Solok and local higher education institutions, participants established professional learning communities dedicated to sharing AI-related experiences, instructional resources, and best practices. Such collaborative networks are expected to facilitate continuous knowledge exchange and encourage educators to remain updated with rapid technological developments. This collaborative approach aligns with Diffusion of Innovation Theory, which explains that the successful adoption of innovations depends not only on individual competencies but also on communication networks, peer influence, and organizational support (Rogers, 2003). Therefore, building sustainable professional communities represents an important strategy for ensuring the long-term adoption of AI in educational settings.

Overall, the findings demonstrate that the capacity-building program effectively enhanced educators' competencies in utilizing artificial intelligence for instructional material development. The combination of theoretical instruction, intensive hands-on practice, structured mentoring, and collaborative reflection created meaningful professional learning experiences that significantly improved participants' digital competencies. More importantly, the program contributed to a shift in educators' professional mindset, encouraging them to view AI as a collaborative instructional partner rather than a disruptive technology. These findings reinforce the growing body of literature suggesting that the successful integration of AI into education depends primarily on continuous professional development, institutional support, and educators' willingness to engage critically and creatively with emerging technologies (Holmes et al., 2022; UNESCO, 2023).

CONCLUSION

This community service initiative has proven successful in enhancing the capacity of tutors (lecturers and teachers) in Solok to utilize Artificial Intelligence (AI) technology for the development of instructional materials. The hands-on training significantly improved both theoretical understanding and practical skills, reduced the time required to produce instructional materials, and resulted in a variety of interactive digital instructional products.As a recommendation for future community service initiatives, it is suggested that partner institutions (the Department of Education and Higher Education) establish an AI Learning Community in Solok. This step is crucial to ensure the continuous dissemination of knowledge to other educators who have not yet had the opportunity to participate in this training, as well as to formulate local regulations regarding the ethical and responsible use of AI within the academic ecosystem.

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BIBLIOGRAPHY

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2020). *Effective teacher professional development*. Learning Policy Institute.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Holmes, W., Bialik, M., & Fadel, C. (2022). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.

Hwang, G.-J., & Tu, Y.-F. (2021). Roles and research trends of artificial intelligence in mathematics education: A bibliometric mapping analysis and systematic review. *Mathematics, 9*(6), Article 584. https://doi.org/10.3390/math9060584

Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Mollick, E. (2024). *Co-intelligence: Living and working with AI*. Portfolio.

OECD. (2021). *Digital education outlook 2021: Pushing the frontiers with artificial intelligence, blockchain and robots*. OECD Publishing. https://doi.org/10.1787/589b283f-en

Rahman, A., Putra, D., & Lestari, N. (2024). Pemanfaatan artificial intelligence dalam pengembangan modul ajar berbasis Kurikulum Merdeka. *Jurnal Teknologi Pendidikan, 26*(2), 145–160.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Suyanta, S., Wibowo, A., & Pratama, R. (2024). Pelatihan kecerdasan buatan bagi guru dalam meningkatkan kompetensi digital pembelajaran. *Jurnal Pengabdian kepada Masyarakat, 9*(1), 55–68.

UNESCO. (2023). *Guidance for generative AI in education and research*. UNESCO.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education, 16*, Article 39. https://doi.org/10.1186/s41239-019-0171-0