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Training in the Utilization of Artificial Intelligence - Based Digital Media at SMP Muhammadiyah PK Kottabarat Surakarta

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Abstract

Purpose: This study aims to provide training for teachers at SMP Muhammadiyah Program Khusus Kottabarat Surakarta on the ethical and productive use of artificial intelligence (AI) in teaching and learning activities.
Methodology: The study employed a Participatory Action Research (PAR) approach, consisting of three stages: pre-operational (needs identification), operational (training and mentoring), and post-operational (reflection and follow-up).
Results: The training involved 32 teachers and 6 members of the Koddekido team. Through these activities, teachers successfully practiced coding and independently developed interactive quizzes with the assistance of AI, ranging from general information processing to the design of instructional media. These results indicate an improvement in teachers' capacity to design more effective and efficient learning media.
Applications/Originality/Value: The impact of this program is reflected not only in the participants' positive responses to the training but also in a paradigm shift in teachers' perceptions of AI as a creative and collaborative support tool in the educational process. In addition to the training, the Koddekido team provided guidance on the ethical use of AI in developing instructional materials to ensure responsible utilization and adherence to principles of originality.

Pendahuluan

Education in Indonesia continues to face increasingly complex dynamics and challenges, particularly in the rapidly evolving digital era. In this context, the role of teachers as the frontline agents in delivering instructional content is crucial to ensuring the success of the educational process. One of the key aspects in the development of teachers' competencies is their professional ability to adapt and integrate technology as an integral part of the learning process, particularly through the use of artificial intelligence (AI)–based learning media (Yulifda Elin Yuspita & Rezeki, 2022). The importance of integrating technology in education not only reflects efforts to keep pace with technological advancements but also represents a response to increasingly complex global demands (Yuspita et al., 2023).Teachers are no longer expected to function merely as providers of information, but rather as learning facilitators who are capable of creating a stimulating learning environment that is relevant to students' needs (Firmansyah et al., 2025). A wide range of applications has been developed to enhance learning experiences, personalize education, and streamline administrative tasks, including the preparation of instructional materials for students. However, in practice, many teachers still lack sufficient digital literacy, particularly in optimizing the use of artificial intelligence (AI) to support and improve the quality of their teaching. This condition is not proportionate to the rapid development of students' digital literacy, which has already far surpassed that of their teachers. By providing training on the optimal use of AI-based applications, teachers can develop the ability to create instructional materials that are both effective and efficient (Iltavia et al., 2022).The rapid advancement of artificial intelligence (AI) has opened significant opportunities to enhance the quality of education. In recent years, the development of artificial intelligence has brought about fundamental changes in the educational sector, ranging from primary education to higher education (Utami et al., 2024).

Artificial intelligence (AI) is widely utilized to recommend innovative instructional approaches that facilitate teachers' tasks, including the development of adaptive teaching modules, digital assessments, and automated virtual tutoring services (Amelia et al., 2024). AI enables the creation of more adaptive and personalized learning experiences through the analysis of data on students' learning styles, strengths, and weaknesses, allowing learning materials, instructional pace, and teaching methods to be optimally tailored to individual needs (Bria et al., 2024).

In addition to the rapid advancement of AI technology and its application in education, artificial intelligence literacy has become a crucial aspect in supporting effective learning in the digital era. The impact of AI on education in Indonesia offers significant opportunities to enhance the personalization of learning materials and expand access to education; however, it also demands the readiness of both teachers and students to optimize the use of this technology appropriately (Fathon, 2025). AI enables personalized learning on a broader scale, as each student has different learning speeds and styles, and AI serves as a supportive tool for adapting learning materials, methods, and activities to individual student

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characteristics. For example, visual learners can be supported through animated videos generated by AI platforms, while kinesthetic learners can be guided to explore interactive simulations. Through this approach, learning becomes more meaningful and inclusive (Jamilah et al., 2024 In line with this, the Participatory Action Research (PAR) approach has proven effective in empowering educational communities, particularly in enhancing teacher engagement through continuous training and mentoring (Putra & Triastuti, 2019).

AI technology opens opportunities for the development of adaptive learning media capable of identifying learners' individual needs and designing customized instructional materials (Yulifda Elin Yuspita & Rezeki, 2022). Accordingly, teachers are no longer positioned merely as content deliverers but as facilitators who guide learners toward deeper understanding. In an era where information is abundantly available, teachers, as leaders in the learning process, are required to possess the skills to manage, analyze, and effectively communicate information in order to create inspiring and relevant learning environments for today's generation (Yuspita et al., 2023).

Teachers play a pivotal role as key agents in advancing education; therefore, they are required to possess the skills necessary to master digital media in line with contemporary developments (Hakeu et al., 2023). In responding to advancements in educational technology, teachers need to understand the platforms and technologies employed in the teaching and learning process. Such understanding serves as a fundamental basis for selecting appropriate instructional media. Accordingly, teachers' competencies—encompassing both an understanding of learning media and the ability to integrate technology into instructional practices—still require continuous strengthening. Some teachers continue to experience difficulties in adapting to new instructional media and integrating technology into their teaching practices. Despite the availability of various professional development forums, a gap remains between the ideal competency demands and the actual capabilities of teachers in implementing comprehensive instructional media. This challenge is further compounded by the emergence of diverse educational technology platforms, which require teachers not only to be proficient in conventional instructional media but also to be capable of effectively integrating digital technologies.

Teachers' ability to innovate in instructional practices is an essential component of improving the quality of education and learning in the digital era. Teachers who are unable to implement innovation in the learning process may have a significant negative impact on instructional quality. Monotonous learning experiences can lead to student boredom and potentially reduce learners' motivation to participate actively in classroom activities. The teaching and learning process, as an application of knowledge, technology, and skills, is therefore conducted as part of efforts to enhance educational quality (M & Sholihan, 2023). The delivery of learning that is engaging, creative, and informative constitutes a key factor in ensuring that information is easily understood by students. Digital-based instructional media, which are flexible and user-friendly, can accelerate knowledge transformation. Moreover, digital media support students' learning success by facilitating knowledge transfer and assisting learners in accessing information during instructional activities, which has become a primary responsibility of teachers in the modern era (Anwar & Kunci, 2024).

However, despite the substantial potential of AI technology, teachers continue to face significant challenges in adopting and implementing it. Limited understanding, insufficient skills, and, in some cases, restricted access to technology remain major barriers to successful integration (Iltavia et al., 2022). Therefore, strengthening teachers' competencies in utilizing AI-based technologies at SMP Muhammadiyah Program Khusus Kottabarat Surakarta is critically important as an effort to align educational practices with real-world conditions and to support the equitable improvement of learning quality.

Consequently, investment in teacher training and professional development is essential to ensure that technology, including AI, can be utilized to its fullest potential (Mandailina et al., 2024). Schools must also ensure and continuously maintain teachers' competencies in accordance with the training they have undertaken in order to develop more adaptive and productive human resources through the optimization of information technology among Muhammadiyah educators. Furthermore, challenges related to instructional media that inadequately foster students' logical reasoning, along with monotonous quizzes and limited teacher–student interaction in the new normal era, necessitate the development of interactive AI-based learning media by teachers (Subowo et al., 2022).

Metodologi

The method employed to achieve the objectives of enhancing teachers' competencies through the use of AI-based media as innovative learning tools was organized into a series of structured activities. This study adopted a Participatory Action Research (PAR) approach, which was implemented through three stages: pre-operational, operational, and post-operational phase s. The details of each stage are presented as follows:

Pre-operational Phase

The preparation stage was conducted through a needs analysis of teachers, in which the implementation team assessed teachers' requirements and contextual conditions. A needs analysis was also carried out by administering a survey to measure teachers' levels of understanding regarding the use of technology in the learning process. In addition, this stage involved identifying teachers' difficulties in utilizing educational technology and determining appropriate artificial intelligence (AI)–based content to be delivered during the program. The preparation phase further included the provision of necessary equipment and infrastructure, such as computers, projectors, internet access, and other supporting instructional tools.

Operational Phase
The sequence of activities conducted on July 9, 2025, is presented in Table 1 below:

Table 1. Schedule of Activities.

Activity	Time
Opening and Tadarus	07:30 – 08:00 WIB
Opening Remarks	08:00 – 08:30 WIB
Session I (Pre-training)	08:30 – 09:00 WIB
Training and Mentoring	09:30 – 10:00 WIB
Closing and Evaluation	10:00 – 10:15 WIB

The implementation phase consisted of two main activities, namely pre-training and the core training session. The pre-training activity focused on providing teachers with information regarding the importance of AI in education and the benefits of participating in the training program. Meanwhile, the core training session involved the explanation of fundamental AI concepts, types of AI, and examples of their applications in everyday life. All activities were conducted at the Ahmad Dahlan Hall of SMP Muhammadiyah Program Khusus Kottabarat Surakarta.

Post-operational Phase

The post-operational phase represented the final stage of the training program. At this stage, the school principal led an evaluation of the activities that had been completed. The evaluation was conducted to assess the overall implementation of the program. Based on the results, the entire series of activities was carried out successfully, and all participants provided positive responses.

Results and Discussion

The AI training program for teachers at SMP Muhammadiyah Program Khusus Kottabarat Surakarta was conducted on July 9, 2025. The activity was attended by 32 teachers and facilitated by six members of the Koddekido team. The program began with an opening session and welcoming remarks delivered by the head of the Koddekido team, followed by remarks from the school principal. The core activity then proceeded with the training sessions The training consisted of two main stages: the delivery of theoretical material and hands-on mentoring in coding practice and the use of AI-based applications for teachers. Given the wide range of available AI applications, the training was focused on a selected set of tools, namely Pictoblox for developing interactive quizzes and Suno for creating educational songs, as well as the use of Canva AI and CapCut AI for producing instructional content. These applications were selected due to their ease of access across various devices, including laptops, personal computers, tablets, and smartphones.

The delivery of the material was conducted by the head of the Koddekido team. The material emphasized the importance of learning coding and artificial intelligence. First, it highlighted the role of coding and AI in preparing students for their future, as many emerging professions are increasingly related to technology, coding, and AI. Second, learning coding was presented as a means of fostering critical thinking skills. Coding is not solely concerned with computers but also involves problem-solving, logical reasoning, and creativity. Third, individuals who learn coding become more relevant and confident in engaging with technological developments. Teachers who acquire coding skills are better able to communicate about technology and remain up to date with current advancements.

Furthermore, learning coding and artificial intelligence was shown to support teachers in the teaching and learning process. Finally, coding and AI education were emphasized as important tools for teaching ethics, data security, and the limitations and responsible use of technology and artificial intelligence.

The subsequent session addressed the definitions of coding and artificial intelligence. Coding was described as the process of converting human intentions into a format that can be understood by computers through the use of programming languages. It represents a sub-activity of programming and involves providing instructions to computers in various forms, such as personal computers, servers, Internet of Things (IoT) devices, robots, and other systems, by applying solutions formulated through computational thinking. Artificial intelligence, in turn, was defined as a branch of computer science concerned with the development of systems capable of performing tasks that typically require human intelligence, including pattern recognition, decision-making, and data processing.

Table 2. Generative Artificial Intelligence

Content	Type Tools	Output
Text	ChatGPT, Gemini, Copilot	Essays, poems, dialogues, emails
Images	DALL·E, Bing Image Creator, Midjourney	Images generated from text prompts
Music Video	Suno AI, Soundraw Sora by OpenAI, Pika	Songs generated from descriptions Videos generated from narratives
Programming	GitHub Copilot, Replit AI	Assistance in writing computer programs
Design and Presentation	Canva Magic, Tome AI	Automated designs, slides, and infographic

The presence of AI can provide significant benefits when utilized appropriately. One of the key messages conveyed during the training was that AI should not control its users; instead, the mindset must shift toward “users controlling AI.” Following the delivery of the material, hands-on training and mentoring sessions were conducted to allow teachers to practice directly. Each teacher used their own laptop during the session.

The training activities were led by one member of the Koddekido team and supported by other team members who provided individual assistance. The first step involved installing Pictoblox by downloading it via bit.ly/unduhpictoblox and accessing pictoblox.ai. Participants then followed step-by-step instructions provided by the trainer, including an explanation of the flowchart structure used to create block-based coding sequences.

This training program utilized four applications, namely ChatGPT, Canva, Suno, and CapCut. The use of ChatGPT was intended to provide broader access compared to using the application without an account. Creating an account offers several advantages, including the ability to save and review chat histories, share conversations, and access additional features such as voice interactions and custom instructions. Moreover, login prompts tend to appear more frequently for users without an account. Although this does not constitute a major issue, having an account enhances user convenience by minimizing such interruptions.

The second step of the training involved the formulation of effective prompts to assist teachers in completing instructional tasks. For this session, the team selected a specific topic for practical application, namely the development of instructional media.The activity was also covered by several online media platforms and can be accessed through the following links: news.smpmuhpksolo.sch.id, Suara Muhammadiyah, and Jurnal News.

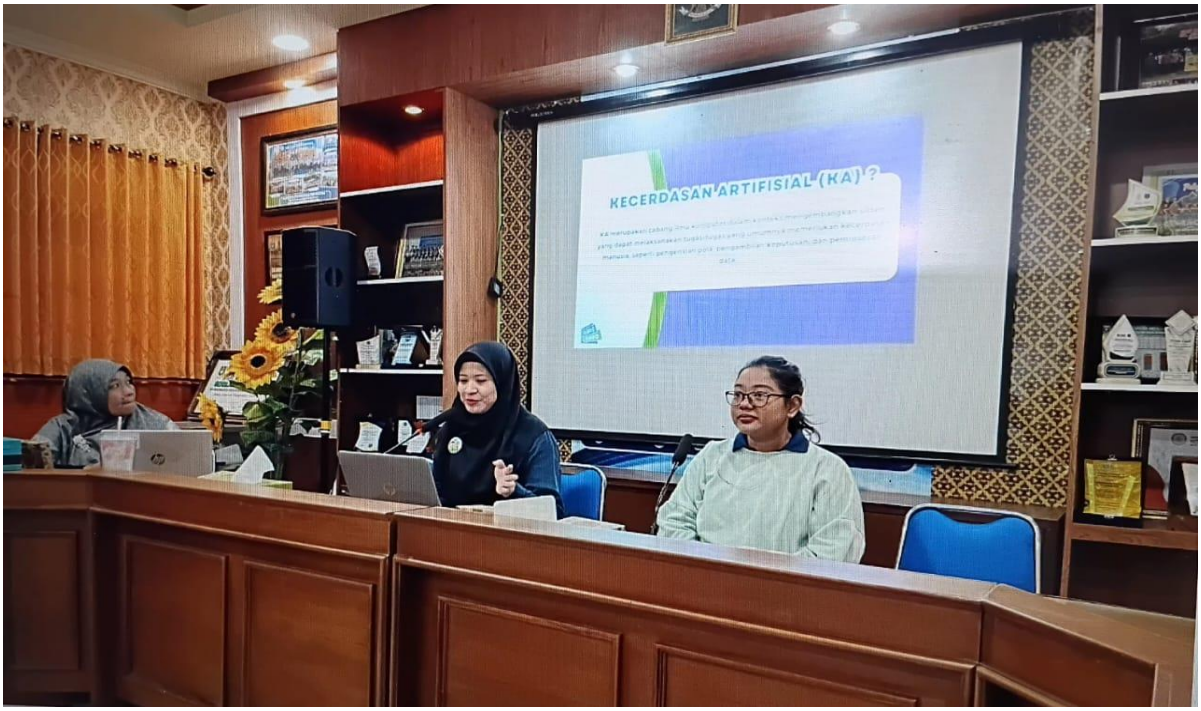

Figure 1 The presenter delivering the material

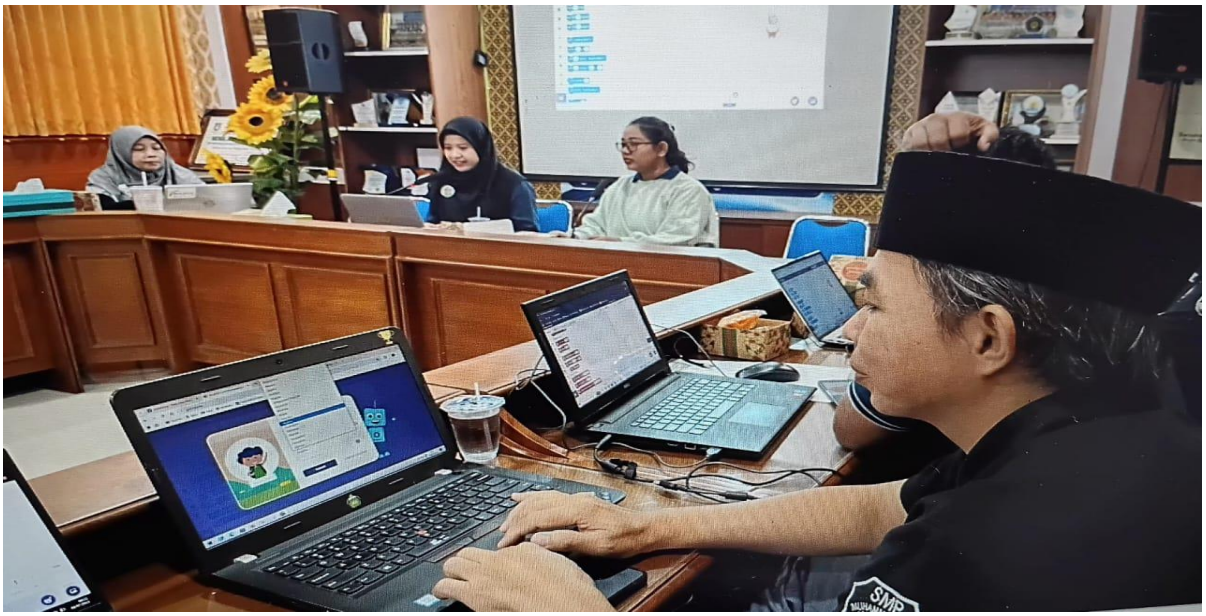

Figure 2. The presenter conducting the training while team members provide mentoring

The development of teachers' competencies in the AI utilization training focused primarily on the creation of instructional media. The presenter also explained how to design appropriate assessments with the assistance of AI, such as interactive quizzes. AI offers innovative solutions to various challenges in education, including providing personalized

feedback to students and assisting teachers in classroom management. However, the implementation of AI also requires careful consideration of several challenges, including costs, the need for adequate technological infrastructure, and ethical issues. Therefore, a holistic approach is necessary for integrating AI into education, encompassing collaboration among the government, educational institutions, and the private sector to ensure that this technology can be utilized optimally without neglecting critical aspects such as data privacy and the essential role of teachers.

The development of teachers' competencies in the AI utilization training was primarily focused on the creation of instructional media. The presenter also demonstrated how to design appropriate assessments with the assistance of AI, such as interactive quizzes. AI offers innovative solutions to various challenges in education, including providing personalized feedback to students and supporting teachers in classroom management. However, the implementation of AI requires careful attention to several challenges, including financial costs, the need for adequate technological infrastructure, and ethical considerations. Therefore, a holistic approach is essential in integrating AI into education, involving collaboration among government bodies, educational institutions, and the private sector to ensure that this technology can be optimally utilized without neglecting critical aspects such as data privacy and the role of teachers.

Overall, the training was conducted smoothly. Nevertheless, several minor obstacles were encountered and successfully addressed by the team. The first challenge occurred during the login process, as some teachers—particularly senior teachers—experienced difficulties using their email accounts for registration. To address this issue, several teachers proceeded without logging in and were still able to use the applications, albeit with certain feature limitations. In addition, some teachers reported ongoing difficulties due to limited prior training and a lack of instructional material references. The AI utilization training activity may therefore serve as a recommendation for further research and development. Future studies may focus on the impact of AI on students, as well as the challenges faced by teachers, learners, and other stakeholders involved in the implementation of technology (Sihaloho & Napitupulu, 2024).

AI plays a crucial role in enhancing the efficiency and effectiveness of the learning process. However, its use in education also presents several challenges. Issues such as privacy and ethical concerns, technology availability, and curriculum alignment must be carefully considered. Additionally, there is a need for increased vigilance regarding the potential counterproductive use of AI and the importance of continuous supervision in its application.

Following this training, teachers' competencies in the context of implementing instructional media are expected to encompass the ability to select, develop, and utilize various forms of media to support the teaching and learning process. These competencies include an understanding of instructional media concepts, the ability to choose media that align with learning objectives and students' characteristics, as well as the skills required to operate and integrate such media effectively into classroom instruction. Although educational curricula continue to evolve in response to changing times, teachers are nonetheless required to engage in continuous learning and adaptation.

Strengthening teachers' competencies through AI utilization training is not limited to enhancing technical skills but also requires a deep understanding of pedagogical contexts and the characteristics of contemporary learners. Teachers need to be equipped with adaptive assessment skills to effectively engage Generation Z students, who are highly familiar with digital technologies (Sari et al., 2024). This perspective aligns with the training approach adopted in this program, which emphasized not only the technical use of AI tools such as ChatGPT and Gemini, but also the development of contextual and relevant instructional media and assessments, including quizzes, that address the demands of modern learning environments. The application-oriented use of AI, such as in the development of teaching materials and learning evaluations, represents a concrete manifestation of a collaborative approach that has been widely implemented in other community empowerment programs (Santoso & Triono, 2024).

Thus, this training activity not only offers short-term solutions to teachers' limitations in developing instructional media but also serves as a strategic step toward preparing resilient, innovative educators who are ready to face the challenges of 21st-century learning. Based on these considerations, the presenters and the team emphasized that the use of AI must always be followed by processes of revision and verification. Outputs generated with the assistance of AI should undergo plagiarism checks, and AI should function solely as a supportive tool rather than a primary means of work. This stance reflects the team's academic responsibility and awareness that AI draws information from diverse sources. Consequently, AI us ers are expected to exercise wisdom and ethical judgment in its use, particularly when disseminating AI-assisted products.

The use of Pictoblox, Canva, and Suno demonstrated positive impacts, particularly in enhancing learning motivation and interest, classroom engagement, learning outcomes, as well as students' critical thinking and problem-solving skills. Nevertheless, the utilization of artificial intelligence also presents potential negative effects, such as increased dependency on technology, the emergence of learner passivity, and a possible decline in critical thinking and creativity. The primary challenges in AI implementation include information accuracy, issues of academic ethics and plagiarism, disparities in access to technology, privacy concerns, and limitations in internet connectivity. In conclusion, the application of AI in academic settings can offer solutions to several instructional challenges. The use of artificial intelligence in education provides numerous benefits, including the enhancement of students' academic competencies, learning motivation, and critical thinking skills through adaptive learning, rapid access to information, and personalized feedback. However, challenges such as technological dependence, diminished critical thinking skills, potential plagiarism, and ethical concerns related to privacy must be carefully addressed. Therefore, the integration of AI into educational systems should be undertaken cautiously, prioritizing supervision, AI literacy, and approaches that balance technological use with human interaction. Such measures ensure that AI supports learning optimally without compromising educational ethics and values (Abdurrahman et al., 2025). Consequently, monitoring AI use and applying principles of academic ethics are essential to maintaining the integrity of the learning process.

This activity received positive responses from participating teachers. One mathematics teacher, Ustazah Frida Nur Safitri, expressed her satisfaction with the training program. She stated, "I now better understand how to utilize social media and AI to support learning. Applications such as Pictoblox can be used to create quizzes, while Suno helps in producing instructional songs."

Through competency development that integrates technological knowledge, enhanced pedagogical skills, and the ability to manage digital classrooms, teachers can create interactive, personalized, and effective learning and working environments (Wahyuni & Haryanti, 2024). Teachers cannot remain isolated from technological advancements, as the students they teach belong to a generation shaped by contemporary developments. Artificial intelligence serves as a promising solution to assist educators in personalizing the learning process. AI technology facilitates educators in designing instructional programs and mapping students' competencies, enabling the development of more engaging and interactive learning materials tailored to individual learners' needs. The implementation of AI in collaborative learning has also been shown to be effective in increasing students' motivation to understand the learning material.

The Koddekido team and the school expressed the hope that AI will no longer be perceived as a threat; instead, when used appropriately, it can become a valuable companion for educators in fulfilling their professional responsibilities. The activity concluded with an evaluation session and closing remarks.

The teacher training program on the use of AI through the Pictoblox and Suno applications was designed to develop teachers' competencies in creating instructional media. AI should not be perceived merely as a threat that hinders teachers' creativity; rather, as demonstrated in this program, it can serve as a supportive tool in preparing the instructional media required for effective learning. Several challenges encountered during the implementation of the training served as reflective input for both the Koddekido team and the school. Moving forward, the school plans to conduct similar training programs to ensure more structured and purposeful use of AI. This initiative is also intended to address plagiarism-related issues associated with the use of AI in educational practices (Iwan Abdy et al., 2025).

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