Educate	*Journal of Community Service in Education* *Vol. 5, No. 1 (2025), pp. 1-8 | e-ISSN: 2828-5727* *http://journal.univetbantara.ac.id/index.php/educate*

High School Teachers Digital Literacy Skills Enhancement Training: Strategies for Preparing Students to Face Technological Challenges

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Submit: 15 Januari 2025; revisi: 15 Juni 2025, diterima: 17 Juni 2025

ABSTRACT
The use of Artificial Intelligence (AI) in education opened up significant opportunities to improve the quality of learning through personalization, efficiency, and innovation. This community service program aimed to enhance the digital literacy of junior high school teachers at SMP IT Baitussalam Prambanan, Yogyakarta by utilizing AI in the learning process. The program involved 14 teachers and included training on integrating AI into lesson planning, implementation, and evaluation using applications such as ChatGPT, Moodle, and coding tools. The methods employed included identifying teachers' needs, preparing training materials, conducting activities, and evaluating the impact. The training results showed an increase in teachers' confidence in developing AI-based Lesson Plans (RPP) and using interactive learning media. AI also helped teachers better understand students' learning needs, creating a more personalized and effective learning experience. The program concluded that AI-based training had a significant positive impact in supporting the transformation of learning, with recommendations for follow-up training to deepen teachers' understanding of AI technology in broader educational contexts.
Keywords: *Artificial Intelligence, Digital, Literacy,*

INTRODUCTION

The development of Artificial Intelligence (AI) technology brings significant changes to various aspects of life, including education (Hanila & Alghaffaru, 2023). With its ability to analyze data, solve problems, and provide relevant solutions, AI has the potential to revolutionize learning (Manu et al., 2023). This transformation not only provides a more personalized learning experience but also enables teachers and students to maximize their time and available resources. AI facilitates learning personalization that was previously difficult to achieve using conventional methods (Maulana, 2024). By utilizing data analytics, AI can identify individual learning patterns and tailor content according to students' needs. This process makes learning more effective, as

students receive materials that match their level of understanding and learning style (Nurhayati et al., 2024). As a result, learning becomes more in-depth and meaningful.

Moreover, AI supports efficiency in learning management. Through AI-based applications, students can develop relevant digital literacy competencies to face the challenges of the Industry 4.0 era (Astriawati et al., 2022). Teachers can utilize AI-powered tools, such as ChatGPT or Canva, to create lesson plans, teaching modules, and learning media more efficiently. By leveraging AI, teachers not only enhance their professional competencies but also reduce administrative workloads, allowing them to focus more on teaching (Astriawati et al., 2021). The use of AI in education also makes the learning process more engaging and interactive (Rahayu & Al Hadi, 2023). AI enables the development of instructional materials that are not only informative but also creative and visually appealing (Nurfaika et al., 2024). It supports the creation of simulations, animations, and educational games that increase student engagement, making them more interested in learning.

In addition, the implementation of AI technology can be aligned with competency-based learning needs (Yahya & Hidayat, 2023). For instance, through learning data analysis performed by AI applications, teachers can identify individual student needs and provide more personalized guidance. Thus, AI not only helps educators develop curriculum-aligned materials but also supports the development of specific student competencies, such as critical thinking, problem-solving, and digital literacy—skills that are essential in this era of digital transformation (Farid, 2023).

Looking ahead, AI is expected to become more integrated into the education system. However, AI is not meant to replace teachers; instead, it serves as a tool to complement the learning process (Munawar et al., 2024). Teachers remain essential as mentors and sources of inspiration for students (Saputra, 2023). With proper AI utilization, education can become more efficient and innovative, fostering a generation better prepared to face future challenges (Soegiarto et al., 2023). The rapid advancement of information technology creates an urgent need to prepare a digitally literate young generation. At the junior high school level, the Informatics subject plays a key role in building foundational skills in technology, logical thinking, and student creativity (Pertiwi et al., 2020). However, many schools still face challenges such as limited infrastructure and a lack of teacher training in technology use.

Through this community service program, the implementing team seeks to provide training for teachers on the application of AI in teaching and learning as an innovative solution to improve the quality of education in the area of digital literacy at the junior high school level. The main objective of this initiative is to enhance digital literacy among junior high school teachers by utilizing Artificial Intelligence (AI) technology in the learning process, particularly in increasing teachers' understanding of AI.

METHOD

This community service program was designed using a collaborative and participatory approach to ensure sustainability and broad impact. The program took place at SMP IT Baitussalam Prambanan, located at Jl. Pulerejo, Pulir Rejo, Bokoharjo, Prambanan Subdistrict, Sleman Regency, Special Region of Yogyakarta 55572. The community service activity was carried out on December 17, 2024, in the East ICT Laboratory of SMP IT Baitussalam Prambanan. A total of 14 teachers from SMP IT Baitussalam Prambanan participated in the program.

The stages of the community service activities included:

1. Identifying the Needs of Teachers at SMP IT Baitussalam
   This stage was carried out through an initial survey to understand the teachers' needs and challenges regarding educational technology. It also included an analysis of the technological infrastructure readiness at the school.
2. Developing the Training Program
   This stage involved creating AI-based training materials, including presentation slides on how

to use applications such as ChatGPT, Quizziz, and Canva. Supporting materials were also prepared, focusing on the implementation of AI in Informatics learning.

3. Program Implementation
   The training was conducted for junior high school teachers on the integration of AI in lesson planning, implementation, and evaluation of the learning process.
4. Evaluation and Reflection
   Data were collected through interviews to evaluate the impact of the program.

RESULTS AND DISCUSSION

Needs Identification at SMP IT Baitussalam Prambanan

The initial step of this community service program was to conduct a preliminary survey to understand the needs and challenges faced by teachers regarding educational technology. This is a common thing to do at the start of community service activities, such as those carried out by Fuedsi et al., (2024). Before the training, teachers encountered difficulties in using technology due to a lack of training and unfamiliarity with integrating technology into their teaching practices, despite the school having adequate infrastructure. In this survey, teachers were invited to engage in direct discussions to identify key obstacles, such as the lack of training on the latest technologies and challenges in integrating technology into the curriculum, as highlighted in previous research (Addinna et al., 2024). The data collected provided a detailed overview of teachers' readiness to utilize technology as a learning aid (Ashshiddiqi et al., 2024).

Additionally, the readiness of technological infrastructure at SMP IT Baitussalam Prambanan was analyzed through direct field observations. The service team evaluated facilities such as the availability of computers, internet access, and digital learning spaces. The analysis results showed that the school had excellent readiness in terms of hardware and network capacity. The information obtained from the survey and analysis formed the basis for designing a training program aligned with the school's needs. This approach ensured that the proposed solutions were not only relevant but also practically applicable, allowing teachers to fully utilize technology in their daily teaching activities.

Training Program Development: AI Implementation in Informatics Learning

The training program aimed to provide an in-depth understanding of the application of Artificial Intelligence (AI) in education, particularly in the context of Informatics learning. Participants were introduced to how AI technology could be used to enhance learning effectiveness and quality, with a focus on using applications such as ChatGPT, Moodle, and coding for AI integration. In an ever-evolving educational landscape, the ability to integrate AI helped teachers create more interactive and personalized learning experiences for students (Pasaribu et al., 2024).

As a starting point, the training introduced the basics of AI usage in educational settings. Participants received guidance on how to use ChatGPT to develop instructional materials, facilitate discussions, and provide real-time feedback to students. In addition to hands-on teaching, the training also provided participants with support materials focused on integrating AI into the Informatics curriculum. Participants learned how to develop AI-based teaching modules and design lesson plans (RPP) that incorporated AI tools to support learning objectives. The resulting modules and lesson plans focused on leveraging technology to create more personalized and interactive learning, allowing students to access materials tailored to their learning styles and pace.

Moodle, a widely used Learning Management System (LMS) in educational institutions, was also introduced in the training. With the advancement of Artificial Intelligence, integrating AI with Moodle could create a more interactive and personalized learning environment (Ashshiddiqi et al., 2024). One of the main benefits of integrating AI into Moodle was its ability to personalize learning. AI could analyze student learning data—such as interaction patterns and assessment results—to adjust materials and teaching methods based on individual needs, optimizing learning outcomes (Agusta et al., 2023). This helped students learn in the most effective ways for them, improving

both motivation and overall achievement.

Furthermore, the use of tools like H5P enabled Moodle users to create interactive content that actively engaged students. This content included quizzes, interactive videos, and presentations that were not only informative but also engaging, thereby increasing student involvement in the learning process. The integration of AI-based chatbots was also an innovative feature within Moodle (Khairunisa & Suyatmini, 2024). These chatbots could be programmed to answer student questions in real time, provide instant feedback, and offer learning support. With such chatbots, students felt more supported and engaged in the learning process.

Coding played a crucial role in developing and customizing AI features that could be integrated into Moodle. It served as an essential tool for developing and managing AI integration. Through coding, developers could create custom plugins that integrated various AI functionalities. For example, a plugin could be developed to utilize AI models like OpenAI's to generate automatic questions from learning materials. Coding skills also enabled educational institutions to tailor Moodle features to their specific needs, including configuring AI-based assessment systems or integrating other learning tools that supported the educational process. The PowerPoint training materials were also created using AI, such as the tool Gamma, as shown in Figure 1.

Figure 1. Presentation Material Created with the Gamma Application

Program Implementation: Training for Junior High School Teachers on AI Integration in Lesson Planning, Implementation, and Evaluation

This community service program involved 14 teachers from SMP IT Baitussalam in training on the integration of Artificial Intelligence (AI) into the learning process. In their daily lives, teachers had already been using AI, but they had not yet applied it in their teaching practices. This activity helped teachers understand that the basic concept of AI includes its benefits in education, student data analysis, and the use of interactive tools. The teachers were trained to use AI-based applications such as ChatGPT to design more effective and innovative lesson plans (RPP). They were also introduced to platforms like Moodle and basic coding to support AI-based instruction. Moodle was intended to be used regularly in the future for assigning tasks, managing virtual classes, and monitoring student progress through AI-driven analytics features.

Participants showed initiative in developing interactive teaching materials using tools like Canva AI and Gamma. The learning evaluation included instruction on how to analyze data from AI-based applications, allowing teaching methods to be adapted to students' needs. The implementation of the program is illustrated in Figure 2 below.

Figure 2. Implementation of Training Activities for SMP IT Baitussalam Teachers

The training demonstrated that AI integration could enhance the quality of teaching and create an engaging learning experience through the personalization of instructional materials. Several teachers began to implement Artificial Intelligence (AI) in their daily teaching routines. The use of AI was no longer limited to training sessions but had become a part of the teachers' professional habits in designing, conducting, and evaluating the teaching and learning process. The challenges encountered included limitations in technological infrastructure at the school and the need for further training for teachers at SMP IT Baitussalam Prambanan, Yogyakarta.

Evaluation and Reflection of the Community Service Activity

Data collection through interviews to evaluate the impact of the community service activities—which focused on training junior high school teachers in the integration of Artificial Intelligence (AI) in lesson planning, implementation, and evaluation was a crucial step in assessing the effectiveness of the (Sarjono & Rejokirono, 2025). Interviews, as a qualitative method, allowed the researchers to gather in-depth information from the participants, who in this case were the teachers involved in the training.

The main purpose of the interviews was to explore the teachers' experiences, perceptions, and the changes they observed after participating in the training. The interview results showed that the majority of teachers felt more confident in planning and delivering lessons using AI technology. They reported improvements in their ability to design innovative and faster lesson plans (RPP).

Additionally, the teachers recognized the benefits of using AI-based tools to create interactive and engaging learning materials for their students. Some teachers stated that the integration of AI had helped them better understand their students' learning needs. Through data analysis provided by AI applications, they were able to tailor teaching materials to match the abilities and learning styles of individual students.

In line with the findings of Ashshiddiqi et al., (2024), this contributed to increased student engagement in the learning process. Overall, data collected through interviews provided valuable insights into the impact of this community service activity. By understanding the participants' experiences and perceived outcomes, program organizers were able to make improvements for future initiatives. Evaluation played a vital role in ensuring that the community service program was not only effective but also relevant to current educational needs. Another important observation from the interviews was the teachers' increased curiosity and motivation to explore more AI tools beyond those introduced in the training. Several participants expressed a desire to deepen their understanding of applications like ChatGPT and Canva AI, and even to learn how to develop simple AI-based tools on their own. This enthusiasm indicated a significant shift in mindset—from passive users of technology to proactive learners and creators.

Some teachers mentioned that before the training, they viewed AI as a complex and intimidating concept, only applicable to high-level technical domains. However, the community

service program successfully broke down this perception by presenting AI tools in a practical, classroom-friendly manner. As a result, AI was no longer perceived as abstract or distant, but as an accessible tool that could be used to solve real classroom challenges.

The training also fostered collaboration among teachers. During the sessions, teachers were encouraged to work in groups to create AI-based learning materials. This collaborative approach not only increased the quality of the materials produced but also built a stronger sense of community among the participants. Teachers began to share resources, exchange ideas, and support each other in implementing new technologies.

A number of teachers highlighted how AI helped them address differentiated instruction in their classrooms. Using AI-generated insights, they could identify which students needed more support and which ones were ready to move ahead. This capability significantly improved classroom management and allowed for more effective use of time and resources.

Moreover, several teachers began incorporating interactive AI-based content, such as quizzes, simulations, and multimedia presentations into their daily lessons. Students reportedly showed higher levels of engagement and enthusiasm when using these materials. The learning atmosphere became more dynamic, and student participation increased notably, especially among those who were previously passive.

In addition, AI integration helped streamline the assessment process. Teachers used AI tools to create automatic quizzes, generate feedback, and track student progress over time. This not only reduced the teachers' workload but also provided students with immediate and personalized feedback, which helped reinforce learning more effectively.

Another key finding was that the training provided a sense of empowerment for the teachers. By mastering new tools, they felt more competent and confident in their roles as educators in the digital age. Many teachers expressed pride in being able to introduce new technologies in their classrooms, which in turn inspired their students to become more digitally literate.

Despite the positive outcomes, teachers also reflected on the limitations they faced (Astriawati et al., 2025). The primary concern was the lack of consistent access to up-to-date devices and reliable internet connections in all classrooms. While the school's infrastructure was generally sufficient, certain technical issues still posed occasional challenges during AI integration. Teachers also emphasized the need for ongoing support and follow-up training. They suggested that the one-time workshop should be followed by regular mentoring sessions or online forums where they could ask questions, troubleshoot problems, and share discoveries related to AI in education. Sustained professional development, they believed, was essential to fully integrate AI into their teaching practices.

Lastly, the community service team concluded that the success of this program relied heavily on the participatory and responsive approach taken during planning and implementation. By involving teachers in identifying their needs and customizing the training accordingly, the program ensured that its outcomes were relevant and practical (Astriawati et al., 2019). This approach can serve as a model for future teacher development initiatives focused on educational technology.

CONCLUSION AND RECOMMENDATIONS

This community service activity successfully provided 14 teachers from SMP IT Baitussalam Prambanan with both practical skills and conceptual understanding of Artificial Intelligence (AI) integration in teaching and learning. The training covered aspects of planning, implementation, and evaluation of AI-based instruction using applications such as ChatGPT, Moodle, and coding tools. The results of the program indicated that the majority of participants felt more confident and capable in designing innovative lesson plans (RPP) and utilizing interactive learning media. Furthermore, the integration of AI proved to be beneficial in helping teachers identify students' learning needs more effectively, enabling a more personalized and engaging learning experience. Teachers reported improvements in both the quality and efficiency of their teaching processes. These outcomes aligned to empower educators to embrace technology as a transformative tool

in education. However, the implementation process faced certain challenges, particularly the need for follow-up training sessions. The findings highlighted that sustainable support and continuous professional development were essential to ensure long-term success in adopting AI technologies in education. Limitations such as varying levels of infrastructure readiness and the need for deeper technical knowledge among teachers were also noted.

It is recommended that more in-depth and topic-specific training programs be conducted in the future, focusing on advanced features and best practices for AI tools in various subject areas. Future training should also include hands-on workshops and mentoring components to provide teachers with real-time guidance and peer collaboration opportunities. Moreover, establishing a support network or digital community for AI-integrated teaching practices could help teachers stay updated with the latest tools and trends. This community could serve as a platform for knowledge exchange, problem-solving, and ongoing innovation in classroom practices. In addition, schools and educational institutions are encouraged to invest in infrastructure improvements to support digital learning. This includes ensuring reliable internet access, updated hardware, and administrative support for teachers who wish to incorporate AI tools in their daily instruction. To maximize the impact of AI in education, it is essential to foster a culture of experimentation and innovation among educators. Encouraging teachers to share success stories and challenges will contribute to a collective learning process and continuous improvement.

Finally, collaboration between schools, universities, and educational technology experts should be strengthened to design context-appropriate AI training modules. Such collaborations can enrich the content and ensure relevance to local educational needs. By addressing these recommendations, the implementation of AI in schools can be more effective, inclusive, and sustainable, ultimately enhancing the quality of education and student learning outcomes.

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