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Introducing Artificial Intelligence Utilization in Learning to High School Teachers

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Abstract: *The development of artificial intelligence (AI) has significantly impacted various sectors, including education. However, based on observation, no AI tool-integrated course has been utilized by teachers at SMA 6 Cirebon. Moreover, based on the pretest assignment, the average understanding of teachers in SMAN 6 Cirebon regarding AI technology was only 55.48%, indicating challenges in implementing AI tools due to a lack of knowledge and practical guidance. To address this issue, a community service activity was held to empower teachers with applicable AI knowledge and skills through a seminar titled "How AI Learns Like a Brain: Implementasi AI dalam Pembelajaran". A qualitative approach was employed, beginning with seminar preparation, AI literature review, and interactive team discussions. Pre- and post-tests showed an increase in understanding of AI technology, with the mean score rising from 55.48% to 67.22% and the median score increasing from 60% to 80%. Finally, this community service recommends ongoing training, the development of AI-integrated lesson plans, hands-on workshops, and collaboration with educational authorities to support the further implementation of AI in teaching.*

Introduction

As the world enters the digital age, technology continues to improve and develop at a significant rate. One product of innovation is Artificial Intelligence (AI), which has seamlessly integrated into various aspects of daily life, including education (Priyahita, 2020). AI technology enables machines or computers to replicate human skills and perform tasks that require human intelligence (Sheikh et al., 2023). For educators, AI presents an opportunity to enhance teaching methods, improve learning efficiency, and create more personalized learning experiences for students (Nur Fitria, 2023). By assisting with tasks such as grading, attendance tracking, and lesson planning, AI enables teachers to dedicate more time to refining their teaching strategies and enhancing the overall quality of their lessons (Chen et al., 2020).

At SMAN 6 Cirebon, several critical issues were identified. Firstly, there is no AI-based tool that has been integrated into any teaching practice or subject course. Teachers are still highly dependent on conventional teaching approaches and lack exposure to AI-based educational technologies, such as intelligent tutoring systems, adaptive learning platforms, and automated feedback tools. Secondly, a pretest of participating teachers showed an average AI understanding score of only 55%, indicating low comprehension of basic AI concepts and a lack of digital readiness in terms of understanding how AI operates and can be applied in classroom contexts.

Qualitative interviews conducted informally during preliminary visits further revealed that many teachers perceived AI as too complex or unrelated to their subject areas. Some expressed concern that AI might replace teachers rather than support them, reflecting common misconceptions that stem from insufficient exposure and training. Additionally, the school's limited access to digital infrastructure and the absence of AI-focused professional development programs have hindered its slow adaptation to educational technology innovations.

This condition highlights the urgent need to raise awareness and build competence in AI among teachers. As AI continues to shape the future of education, teachers must understand its capabilities and learn how to integrate it effectively into classrooms to support interactive and student-centered learning. However, in Indonesia, the adoption of AI in education still faces many challenges, especially at the teacher level. A study highlights a notable lack of teacher training programs focused on using AI, leaving many unprepared to integrate AI tools into their teaching practices. This gap underscores the need for comprehensive professional training to equip teachers with the necessary skills and knowledge to effectively utilize AI in the classroom (Syarifudin, 2024).

With this background and the awareness that teacher training in AI is lacking, the lecturers from Sampoerna University's Faculty of Engineering and Technology initiated this community service program to empower teachers at SMAN 6 Cirebon, a public high school located in East Java, Indonesia. The school was selected based on prior collaboration, its openness to innovation, and its strong need for capacity-building in digital education. The program, titled "How AI Learns like a Brain: Implementasi AI dalam Pembelajaran", is a continuation of the previous community service activity (Rahim et al., 2023). The goal of this initiative is to introduce the foundational concepts of AI and build the capacity of teachers to adopt AI tools in education, with the expected social change being increased digital competence, innovation in pedagogy, and better preparedness for future education systems.

Method

Preparation for the community service activity began in early January 2025 through communication with the school management and the Vice Head of SMAN 6 Cirebon. A collaborative discussion was carried out to select a seminar topic that would support the

teachers' professional development and address the school's interest in digital transformation. This resulted in the agreement to conduct a seminar titled How AI Learn Like a Brain: Implementasi AI dalam Pembelajaran, which was highly aligned with the objective of this community service: to enhance teachers' understanding of artificial intelligence and empower them to begin integrating AI concepts into the learning process. Internal team meetings followed to finalize the seminar structure, prepare supporting materials, and arrange the venue and logistics.

The subject of this community service activity was the teaching staff of SMAN 6 Cirebon, a public senior high school located in the city of Cirebon, West Java. The community service was conducted in the SMAN 6 Cirebon classroom on 7 February 2025, involving a total of 66 teachers from various subject backgrounds. The school had previously expressed interest in digital technology and had been involved in earlier PKM activities.

A literature review was conducted to gather updated references, including topics such as searching, reasoning, planning, learning, and other materials from Artificial Intelligence: A Modern Approach by Stuart J. Russell and Peter Norvig (Russell & Norvig, 2021). These references were used to generate a seminar presentation designed for high school educators. This activity also developed the previous AI-focused exploration delivered by the PKM team at SMPN 174 (Djajasoepena et al., 2024) and builds upon two earlier PKM initiatives at SMAN 6 Cirebon focused on Smart Machine Technology (Rahim et al., 2023) and solar panel installation for the library (Lestari et al., 2022).

To ensure active engagement from both parties, the school played a key role in organizing teacher participation, determining the seminar schedule, and providing the necessary facilities. As part of the seminar, prizes were awarded to participants who completed the pre-test and post-test quizzes. These were presented to three lecturers who actively participated and emerged as winners during the interactive quiz session. Online quizzes were introduced to foster interactivity between the speakers and the audience. Figure 1 shows various activities done in this community service program.

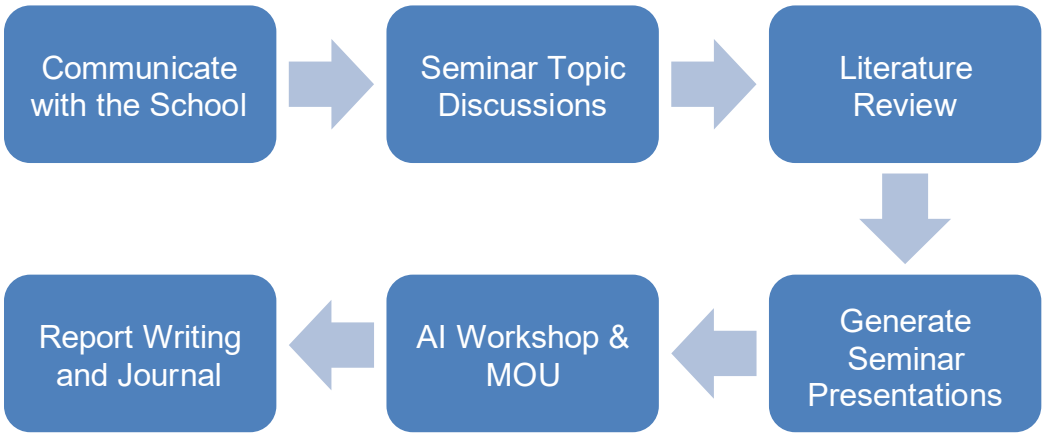

Figure 1. Community Service Activities

This community service utilized a quantitative research methodology, employing pre-test and post-test assessments within a workshop on the Implementation of AI in Education to evaluate teachers' knowledge of artificial intelligence before and after the seminar. The data collected were analyzed using Python, with tools such as Pandas, Matplotlib, and Seaborn to quantify and visualize the results. Additionally, the process included preparing the report and developing this article for journal publication.

As part of the collaboration, Sampoerna University and SMAN 6 Cirebon signed a Memorandum of Understanding (MoU) to formalize their cooperation. The scope of this Memorandum of Understanding (MoU) encompasses education, community service, and the development and empowerment of resources for both parties. The MoU signing ceremony is shown in Figure 2.

Figure 2. MoU Ceremony

Results and Discussion

Communications with the school were established around the first week of January via online communication. Seminar topic discussions have been held internally and with the school representative to define suitable topics for a one-day seminar session. Through this collaborative planning phase, involving both the community service team from Sampoerna University and the representatives of SMAN 6 Cirebon, the selected topic was finalized: “How AI Learn Like a Brain: Implementasi AI dalam Pembelajaran.” The seminar focused on the implementation and usage of artificial intelligence in education.

The seminar was conducted on 7 February 2025 in the school’s second-floor hall, with 66 teachers participating from diverse subject backgrounds, including the school’s vice heads. The session was facilitated by two resource persons, Gilang Raka Rayuda Dewa and Ariana Tulus Purnomo, and lasted for approximately three hours. The event included a pre-test to gauge initial AI knowledge, a seminar session, interactive discussions, and a post-test using Quizizz. The activity also received media coverage in RadarCirebon (Haryadi, 2025), further

demonstrating its relevance and public value. Figure 3 shows the seminar session with teachers in a hall in the second-floor room.

Figure 3: Seminar Session with Teachers

The effectiveness of the seminar was assessed using pre-test and post-test evaluations. The results, illustrated in Figure 4, showed a clear improvement in participants' understanding of AI concepts. Initial scores clustered at 40 and 60, while post-test scores concentrated around 80–90, indicating learning gains. A detailed question-by-question analysis in Figure 5 revealed a significant improvement, particularly in the topics of AI implementation and its impact on education. While some areas, such as AI ethics and specific platforms, showed mixed results, the data suggest that the seminar achieved its intended purpose as an introductory awareness program. The increase in average scores from 55.48 to 67.22 points, though modest, validates the seminar's role in fulfilling the community service goal of fostering foundational digital literacy among educators. Teachers expressed interest in learning how AI can be applied in their teaching areas and requested future sessions with practical AI tools, reinforcing the relevance of this initiative to real classroom needs and aligning with the broader aim of long-term capacity building in digital education.

Figure 4. Pre-Test vs Post-Test Score Distribution

A comprehensive analysis of test performance details exists in Figure 5, which shows the development of question-by-question accuracy between the pre-test and post-test phases. A substantial improvement occurred in response accuracy regarding AI implementation methods since pre-test scores started at 47% but rose to 87% during the post-test. The proportion of participants who were correct in their answers about AI's effects on teaching increased from 47% to 69%. The number of participants answering questions about AI ethics dropped from 81% to 69% during this study period although the subject might need more focused attention in upcoming periods. Teachers require hands-on experience with AI tools because their knowledge of AI platforms declined from 50% to 38%.

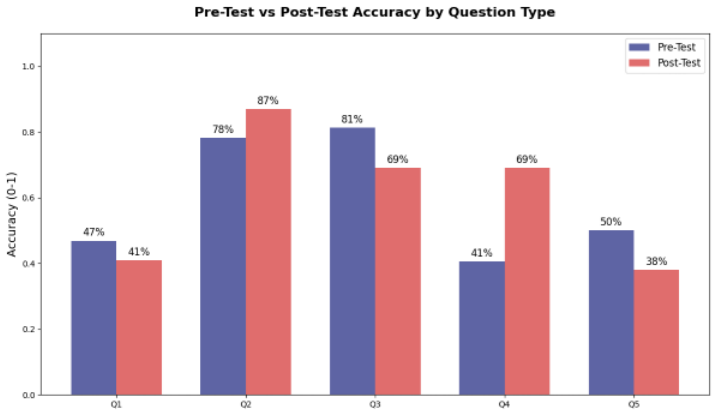

Figure 5. Pre-Test vs Post-Test Accuracy by Question Type

Table 1. Question Mapping Reference

ID	In Bahasa Indonesia	In English
Q1	*Manakah dari berikut ini yang paling tepat mendefinisikan Kecerdasan Buatan (AI)?*	Which of the following best defines Artificial Intelligence (AI)?
Q2	*Manakah dari berikut ini yang merupakan contoh penerapan AI dalam kehidupan sehari-hari?*	Which of the following is an example of an AI application in daily life?
Q3	*Bagaimana etika penggunaan AI dalam pembelajaran yang sesuai?*	What are the appropriate ethics for using AI in learning?
Q4	*Manakah dari berikut ini yang merupakan aplikasi AI untuk pembelajaran adaptif?*	Which of the following is an AI application for adaptive learning?
Q5	*Bagaimana platform AI, seperti ChatGPT, Gemini, dll., dapat dimanfaatkan dalam*	How can AI platforms, such as ChatGPT, Gemini, etc., be utilized to analyze and

	analisis dan penyusunan rencana pembelajaran?	prepare lesson plans?

Table 2. Score Comparison

Statistical Measure	Pre-test	Post-test	Change
Number of Participants (n)	31	36	+5
Mean Score	55.48	67.22	+11.74
Median Score	60.00	80.00	+20.00
Mode	40.00	80.00	+40.00
Standard Deviation	20.77	26.31	+5.54
Minimum Score	20.00	0.00	-20.00
Maximum Score	100.00	100.00	0.00
First Quartile (Q1)	40.00	40.00	0.00
Third Quartile (Q3)	60.00	80.00	+20.00

An overall assessment of pre-test and post-test average scores appears in Table 2. A total of 55.48 points emerged as the average pre-test response while participants scored 67.22 points on average during the post-test which led to an 11.74-point improvement. The participants gained some worthwhile insights from the seminar although the improvement was not major. The minimal score elevation after this one seminar might show that it delivers effective introductory knowledge yet advanced and more sessions would enhance deeper comprehension.

Multiple teachers expressed their specific interests in AI applications for their teaching subjects, yet they also emphasized the importance of human connection to teaching during the Question-and-Answer discussion. The workshop participants desired additional learning opportunities where they could practice using educational AI programs.

Finally, the overall timeline is described as follows. The preparation for the community service, including discussions with the school management and the Vice Head of School, was carried out in January 2025. Following these discussions, internal planning and procurement of supporting materials were finalized by February 2025. The seminar session with teachers was successfully held in February 2025. The final phase, which involved writing the report and paper manuscript, was completed between February and March 2025. Table 3 outlines the sequence of activities completed as part of the community service project at SMAN 6 Cirebon.

Table 3. Summary of Community Service Activities

#	Activity	Status	Schedule
1	Community Service Preparation	Completed	January 2025
2	Discussion with the School Management and Vice Head of School	Completed	January 2025
3	Internal Discussion and Planning	Completed	January 2025
4	Procure Supporting Materials	Completed	February 2025
5	Seminar Session with Teachers	Completed	February 2025
6	Writing Report and Paper Manuscript	Completed	February-March 2025

Conclusion

This publication describes community service activity conducted at SMAN 6 Cirebon, Indonesia, between January and March 2025. The activities included discussions with school management, internal planning, and the delivery of a seminar on the implementation of AI in education. The seminar successfully engaged 66 teachers and included pre- and post-tests to assess their knowledge. Based on the results, there was an average score improvement from 55.48 in the pre-test to 67.22 in the post-test, indicating that the seminar effectively helped participants enhance their understanding of AI in teaching. Notably, there were significant gains in knowledge related to AI implementation methods and the impact of AI on teaching, although topics such as AI ethics and familiarity with AI platforms showed a need for further attention. The program concluded with the preparation of this report and manuscript for journal publication. In line with the goals of the community service program to enhance digital competency and AI literacy among teachers in SMAN 6 Cirebon, we recommend that the school organizes regular training regarding AI-based teaching applications. Furthermore, SMAN 6 Cirebon is encouraged to develop internal guidelines for AI tool use in classrooms, provide hands-on workshops for students, and actively collaborate with education stakeholders to support the broader integration of AI in their curriculum. These steps are necessary to ensure the sustainability of AI adoption and to create an environment where technology can effectively support teaching and learning.

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