

# Application of Artificial Intelligence (AI) in Learning to Improve Teacher Competence at MTs NU Umbul Sari

Kelvin Aprianto<sup>1</sup>, Ma'rifatul Munawaroh<sup>2</sup>, Salysa Eka Nabilla<sup>3</sup>, Thoha Firdaus<sup>4</sup>

Universitas Nurul Huda<sup>1,2,3,4</sup>

## Article Info

### Keywords:

Artificial Intelligence (AI)  
Teacher Competencies  
Independent Curriculum  
Adaptive Teaching Module  
Digital Literacy

## ABSTRAK

This study aims to improve the competence of MTs NU Umbul Sari teachers in compiling adaptive teaching modules and utilising technology in the digital era, especially related to the Independent Curriculum, considering time constraints, low digital literacy, and complex perceptions of AI. This training uses preparation methods, core training (through interactive workshops on basic introduction to AI, utilisation of AI for developing teaching modules such as ChatGPT, Gamma AI, and InVideo, as well as learning and assessment efficiency), and evaluation (pre-post training questionnaires and interviews). The results showed a significant increase in teachers' conceptual understanding of AI and its applications, positively correlated with an increase in pedagogical competence (adaptive learning design, personalisation of materials) and digital (integration of relevant AI tools). This training successfully bridged the gap between the demands of the Independent Curriculum and teacher capacity, strengthening their role as innovative learning facilitators.

*This is an open-access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.*



## Corresponding Author:

Kelvin Aprianto  
Universitas Nurul Huda, Sumatera Selatan, 32161, Indonesia.  
Email: [aprianto@student.unuha.ac.id](mailto:aprianto@student.unuha.ac.id)

## 1. INTRODUCTION

Technology education today is very important considering the rapid development of artificial intelligence (AI) technology, which has a significant impact on various areas of life, including education [1]. In the digital era, AI has become an important tool in improving the quality and efficiency of learning. Artificial Intelligence refers to the ability of a computer system to perform tasks that usually require human intelligence, such as natural language processing, decision-making, learning from experience, and other cognitive tasks [2]. At the junior high school level, the potential of AI is actually very large, from helping the learning process that is tailored to students' needs to simplifying the assessment system. Unfortunately, the use of this technology in schools is still very limited, one of the reasons being that not many teachers feel ready to use AI in teaching and learning activities [3].

Artificial intelligence AI is present as a comprehensive solution to overcome these challenges. AI significantly improves the competence and efficiency of teachers in helping to prepare teaching modules, lesson plans, presentation slides, and innovative and interesting learning videos through AI such as ChatGPT, Gamma AI, and Invideo AI. AI can ease the burden on teachers by automating assignment checks and monitoring student progress using ChatGPT to answer questions outside of office hours. AI also plays a role in improving teachers' teaching skills, enriching their insights into the learning process, and supporting ongoing professional development [4]. Teachers can also access innovative learning resources and create interactive content, such as learning videos, with InVideo AI.

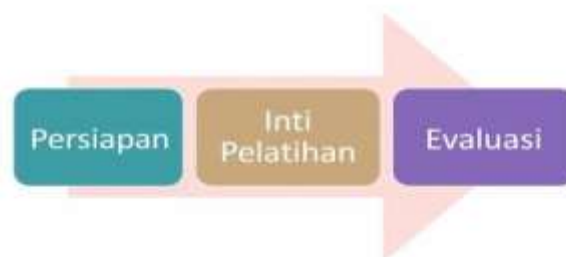
AI training for teachers at MTs NU Umbul Sari was held with the main aim of improving teacher competence in facing the challenges of education in the digital era, while optimising the implementation of the Merdeka Curriculum. We strive to equip teachers with strong digital literacy and practical skills in utilising AI

so that they can overcome time constraints in compiling adaptive teaching modules and planning learning effectively. Through this training, teachers will be able to better visualise abstract concepts through interactive AI simulations and lighten the burden on teachers in the learning and assessment process. Ultimately, this training aims to create a personal, adaptive, and interactive student learning experience while encouraging innovation and transformation of teacher education at MTs NU Umbul Sari.

The implementation of Artificial Intelligence (AI) at MTs NU Umbul Sari faces significant challenges. Teachers are often constrained by time and low digital literacy in compiling adaptive teaching modules according to the Merdeka Curriculum. Many teachers have not optimally utilised technology, even considering AI complex [5]. Therefore, this study aims to answer: How can AI effectively improve teacher competency at MTs NU Umbul Sari to overcome these obstacles, and what is the role of AI in making it easier for teachers to create teaching materials? This training and research have great significance for teachers at MTs NU Umbul Sari. This training is a strategic step in implementing the Merdeka Curriculum more effectively and encouraging the transformation of education towards the digital era of teachers, this training will improve their digital competency and literacy, facilitate the preparation of adaptive teaching materials, and time efficiency. Meanwhile, students will feel the benefits directly through a more personal, interactive, and interesting learning experience, which will ultimately increase their understanding and motivation in learning.

## 2. METHOD

The method of implementing community service is shown in Figure 1. The implementation of community service begins with planning, then the core training, and ends with an evaluation in the form of a pre-test and post-test. This is in accordance with the general guidelines for upskilling and reskilling vocational teachers [6]. The entire activity was carried out on June 4, 2025, by three Physics Education students from the Faculty of Education, Nurul Huda University, targeting MTs NU Umbul Sari teachers. There are three stages, namely: Preparation, Core Training, and Evaluation.



**Figure1. Method of Implementing Community Service**

The implementation of this activity will begin with a preparation stage, including coordination with MTs NU Umbul Sari to determine the training schedule and technical details. This stage is crucial to ensure alignment between teachers' needs and the material to be delivered. Additionally, the organising team will compile AI training modules tailored to the challenges and opportunities in the teaching and learning process. Preparations will also include setting up supporting infrastructure, such as technological devices and internet access, to ensure smooth training execution.

The training modules will be systematically designed, covering an introduction to AI basics, its application in teaching module development, and improving efficiency in learning and assessment. Examples of AI tools to be introduced include ChatGPT for content creation, Gamma AI for interactive presentations, and InVideo for video-based learning media. The material is structured based on teachers' needs to ensure practicality and ease of implementation in daily activities. This approach allows participants to immediately apply the knowledge they acquire.

At the core stage, training will be conducted through interactive workshops combining theory sessions and hands-on practice. Teachers will be guided in exploring various AI tools and applying them in real teaching scenarios. This method is chosen to enhance participant engagement and ensure deep understanding. Additionally, Q&A sessions and group discussions will be facilitated to encourage the exchange of ideas and solutions to classroom challenges.

After the training, an evaluation stage will be conducted to measure the program's effectiveness in improving teacher competency and its impact on student learning experiences. The primary instrument used

will be a questionnaire to assess teachers' perceptions of the material presented. Data will also be collected through pre-tests and post-tests to compare participants' understanding before and after the training. The evaluation results will serve as the basis for recommendations to refine and develop the program further.

The collected data will be analysed qualitatively using the Miles and Huberman interactive model. This process includes data reduction to filter relevant information, presenting data in an easily understandable format, and drawing conclusions with verification to ensure the validity of the findings. The analysis aims to provide a comprehensive picture of the impact of AI training on enhancing teacher competency and transforming the learning process at MTs NU Umbul Sari.

Based on the analysis results, the team will formulate recommendations for improving and expanding the training program in the future. These recommendations may include refining modules, extending training duration, or deepening specific topics. Additionally, follow-up plans such as periodic mentoring and online discussion forums will be proposed to ensure the sustained application of AI in education. Thus, this program will not be a one-time event but rather the first step toward digital transformation in the educational environment.

### 3. RESULTS AND DISCUSSION

This community service program (PKM) begins with systematic preparation, including goal setting, participant targeting, scheduling, and relevant training material development. The program focuses on implementing Artificial Intelligence (AI) training to enhance teacher competency at MTs NU Umbul Sari. Initial findings reveal significant improvements in teachers' understanding and application of AI in education. The study presents data from pre- and post-training questionnaires, along with in-depth interviews, to analyse the program's impact. These results consistently show a substantial increase in teachers' conceptual grasp of AI. [7].

Before the training, many teachers perceived AI as a complex and inaccessible technology. Surveys indicated limited knowledge about AI's definition, mechanisms, and educational applications. Most participants were unfamiliar with generative AI tools like ChatGPT or InVideo for content creation. This gap highlighted the need for structured training to demystify AI concepts. The pre-training data served as a baseline to measure subsequent improvements [8].

After the training, teachers demonstrated a solid foundational understanding of AI principles. They could clearly define AI and explain its basic functionalities in simple terms. Participants also recognised the potential of AI to transform teaching practices, such as automating administrative tasks [9]. The post-training questionnaires showed a marked increase in confidence when discussing AI applications. These results confirmed the effectiveness of the program's theoretical sessions.

Teachers gained hands-on experience with AI tools like ChatGPT for material development and InVideo for visual content creation. They learned to generate lesson plans, quizzes, and interactive simulations using these platforms. Practical workshops enabled them to experiment with AI in real-time, reinforcing theoretical knowledge. Many participants reported feeling more comfortable integrating AI into their daily teaching routines. This shift was evident in the quality of their post-training outputs [8].

The training significantly enhanced teachers' pedagogical skills, particularly in designing adaptive and personalised learning materials. Post-training lesson plans (RPP) showed greater creativity and alignment with student needs. Teachers incorporated AI-generated simulations to explain abstract concepts visually. These innovations made lessons more engaging and accessible for students. The improvements were documented through comparative analysis of pre- and post-training teaching materials.

Teachers exhibited increased confidence in adopting AI-supported teaching strategies. They experimented with interactive simulations and multimedia content to enrich classroom experiences. Many reported feeling empowered to try new methods without fear of technical failure. This confidence translated into more dynamic and student-centred lessons. The training fostered a culture of innovation and continuous improvement.

Beyond pedagogical gains, teachers developed stronger digital competencies. They became proficient in selecting and integrating appropriate AI tools for specific teaching objectives. Participants learned to evaluate the relevance and effectiveness of different technologies. This critical approach ensured optimal use of AI as an active learning medium. The program bridged the gap between theoretical knowledge and practical digital skills.

Teachers moved from being passive users to strategic adopters of AI technology. They identified scenarios where AI could enhance engagement, such as personalised feedback or gamified learning. This strategic mindset was reflected in their post-training classroom practices. Educators prioritised tools that aligned with curriculum goals and student needs. The shift underscored the program's success in fostering intentional technology use.

The training helped teachers reconcile AI integration with the demands of the Merdeka Curriculum. Participants understood how AI could support the curriculum's emphasis on relevance and adaptability. They designed lessons that leveraged AI for differentiated instruction and real-world applications. This alignment strengthened their role as innovative facilitators. The program effectively connected pedagogical theory with curriculum implementation.

Triangulation of pre-test, post-test, and interview data validated the program's positive outcomes. Quantitative results showed statistically significant improvements in AI knowledge and skills. Qualitative feedback highlighted transformative changes in teaching practices. The consistency across data sources reinforced the reliability of the findings. This comprehensive analysis provided a holistic view of the program's impact.

Some teachers initially resisted AI adoption due to fear of complexity or job displacement. The training addressed these concerns through demonstrations of AI's supportive role. Participants realised AI could augment, rather than replace, their teaching expertise. By the program's end, scepticism had turned into enthusiasm. This mindset shift was critical for sustainable AI integration.

The workshops encouraged collaboration, with teachers sharing insights and troubleshooting challenges together. Peer learning accelerated the mastery of AI tools and techniques. Participants formed professional networks to continue exchanging ideas post-training. This collaborative spirit amplified the program's long-term benefits. The social aspect of learning proved to be as valuable as the technical content.

To ensure sustainability, the program included plans for ongoing mentorship and resource sharing. Teachers received access to a digital repository of AI tools and tutorials. Periodic follow-up sessions were scheduled to address emerging needs and challenges. These measures aimed to maintain momentum beyond the initial training. Long-term success depends on continuous support and community building.

Future evaluations will assess the durability of teachers' AI integration over time. Indicators include consistent use of AI tools and further innovations in lesson design. Longitudinal data will reveal whether initial enthusiasm translates into lasting change. Such insights will inform refinements to future training programs. The ultimate goal is to institutionalise AI in educational practices.

The program's success has implications for scaling AI training across other schools. It demonstrates a replicable model for upskilling educators in underserved areas. Policymakers can use these findings to advocate for nationwide AI literacy initiatives. The training aligns with global trends toward technology-enhanced education. These broader applications underscore its transformative potential.

Despite its successes, the program faced challenges like uneven internet access and varying tech literacy levels. Some teachers required additional one-on-one support to fully engage with the material. Time constraints limited the depth of exploration for advanced AI applications. Addressing these barriers will be crucial for future iterations. The lessons learned inform strategies for more inclusive implementation.

Future programs should extend training duration to cover advanced AI applications. Incorporating more localised examples could enhance relevance for diverse teaching contexts. Hybrid models combining online and in-person sessions may improve accessibility. Regular feedback loops will ensure continuous improvement. These adjustments will maximise the program's scalability and impact.

In conclusion, the PKM program successfully enhanced teachers' AI competency and pedagogical innovation. It bridged gaps between curriculum demands and teachers' technological readiness. The findings advocate for sustained investment in educator-focused AI literacy programs. As AI evolves, so must opportunities for teacher professional development. This initiative lays the groundwork for a future where AI empowers every educator and learner.

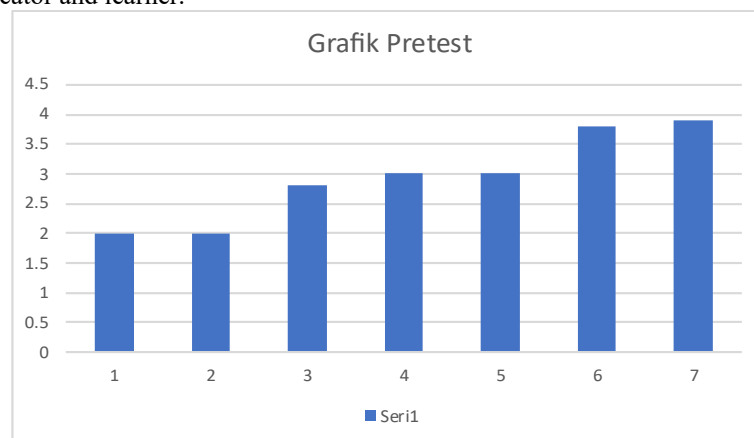


Figure 2. Pretest Graph

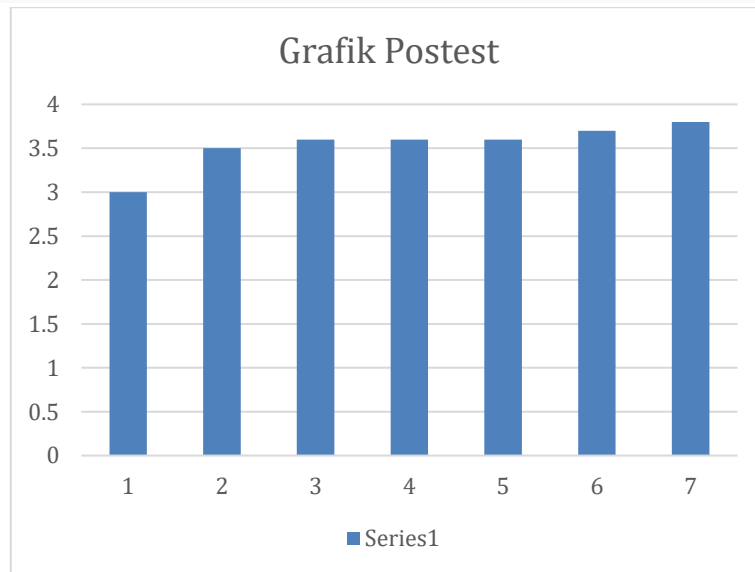


Figure 3. Posttest Graph

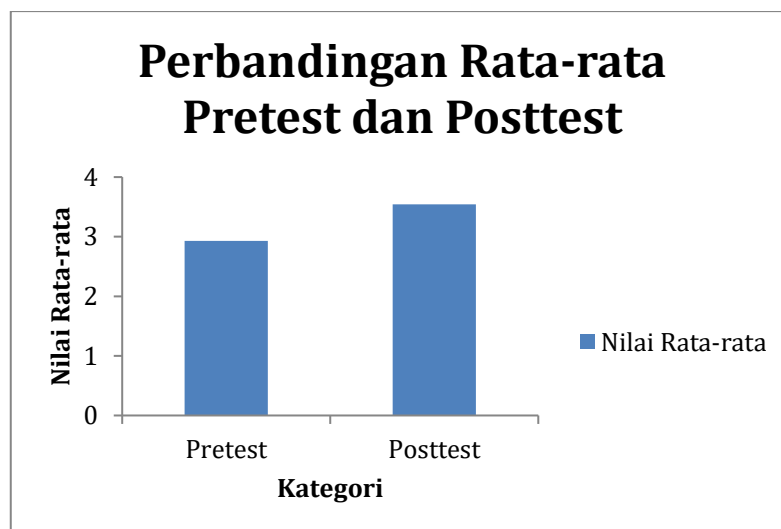


Figure 4. Comparison of Pretest and Posttest Averages

#### 4. CONCLUSION

The implementation of Artificial Intelligence (AI) training at MTs NU Umbul Sari significantly improved teacher competency. Teachers showed a surge in conceptual understanding of AI, including its definition, working mechanism, and potential applications in education. Those who initially considered AI complicated are now able to identify and use generative AI such as ChatGPT for material development and InVideo for visualisation. This increase in understanding is directly correlated with a positive impact on teachers' pedagogical and digital competencies. Pedagogically, teachers are able to design adaptive learning and personalise materials better, as seen from the quality of the Learning Implementation Plans (RPP) and teaching modules they produce. Teachers also showed increased confidence in adopting innovative learning strategies supported by AI, such as creating interactive simulations or presenting abstract concepts in a more visual and engaging way.

From a digital competency perspective, teachers became more proficient, selective, and strategic in choosing and integrating relevant AI tools for active learning media in the classroom. Data analysis from the pre-test and post-test strongly indicated that AI training successfully bridged the gap between the demands of

the Independent Curriculum and teachers' actual capacity. Implications for Improving the Quality of Education The application of AI in learning at MTs NU Umbul Sari has major implications for improving the quality of education. This training is a strategic step in implementing the Merdeka Curriculum more effectively and encouraging the transformation of education towards the digital era. For teachers, this training not only improves their digital competence and literacy but also makes it easier to prepare adaptive teaching materials and increase time efficiency. The ability of teachers to visualise abstract concepts with interactive AI simulations and the lightening of the burden in the learning and assessment process also contribute to the efficiency and effectiveness of teaching.

Meanwhile, students will feel the benefits directly through a more personal, interactive, and engaging learning experience, which will ultimately increase their understanding and motivation in learning. Overall, this AI training aims to create a personal, adaptive, and interactive student learning experience, while encouraging innovation and transformation of teacher education at MTs NU Umbul Sari.

## 5. ACKNOWLEDGEMENTS

The author would like to express his deepest gratitude to Dr. Thoha Firdaus, M.Pd. I am the supervisor for all the guidance, direction, criticism, and valuable suggestions during the process of compiling this article. Your dedication, time, and attention have greatly helped us in completing this article as well as possible. May all your kindness be rewarded accordingly by Allah SWT.

## REFERENCES

- [1] A. Y. Pambudi *et al.*, "Pelatihan Pemanfaatan Teknologi AI dalam Pembuatan PTK bagi Guru SDN Karangasem Kecamatan Jenu," *Semin. Nas. Paedagoria*, vol. 3, pp. 1–8, 2023.
- [2] S. Hanila and M. A. Alghaffaru, "Pelatihan Penggunaan Artificial Intelligence (AI) Terhadap Perkembangan Teknologi Pada Pembelajaran Siswa Sma 10 Sukarami Kota Bengkulu," *J. Dehasen Mengabdi*, vol. 2, no. 2, pp. 221–226, 2023, doi: 10.37676/jdm.v2i2.4890.
- [3] Pristiansyah, N. Pranandita, M. Haritsah Amrullah, and Hasdiansah, "Jurnal Pengabdian Kepada Masyarakat JURNAL DAMARWULAN Jurnal Pengabdian Kepada Masyarakat," *J. Pengabdi. Kpd. Masy.*, vol. 6, no. 1, pp. 45–49, 2022.
- [4] Suariqi Diantama, "Pemanfaatan Artificial Intelegent (AI) Dalam Dunia Pendidikan," *DEWANTECH J. Teknol. Pendidik.*, vol. 1, no. 1, pp. 8–14, 2023, doi: 10.61434/dewantech.v1i1.8.
- [5] R. S. Budiarti, A. Johari, L. Mardiyanti, and D. Mursyd, "PELATIHAN ARTIFICAL INTELLIGENCE UNTUK MENINGKATKAN KOMPETENSI GURU DALAM MENGINOVASI PROSES PEMBELAJARAN," vol. 08, no. 03, pp. 1074–1088, 2024.
- [6] E. R. Widasari, H. Fitriyah, F. Utaminingrum, and R. Primananda, "Pelatihan Pengenalan Dan Penerapan Teknologi Artificial Intelligence Untuk Meningkatkan Kompetensi Guru Smk Negeri 5 Kota Malang," *J. Pengabdi. Masy. Teknol. Inf. Dan Inform. DIMASLOKA*, vol. 2, no. 1, pp. 29–34, 2023.
- [7] P. Damayanti, Z. Haryanto, C. Falentino, S. Devina, and W. Putri, "Pemanfaatan AI Dalam Pembuatan Modul Ajar Untuk Mendukung Implementasi Kurikulum Merdeka," vol. 4, no. 2, pp. 356–369, 2025.
- [8] I. Taufik and I. Rindaningsih, "Pelatihan dan Pengembangan Guru Sebagai Sumber Daya Manusia Bidang Pendidikan di Era Kecerdasan Buatan (AI)," *Manag. Educ. J. ...*, vol. 3, no. 1, pp. 442–448, 2024.
- [9] M. M. Rawas, "IMPLEMENTASI ARTIFICAL INTELLIGENCE DALAM PEMBELAJARAN SEKOLAH DASAR : PELUANG DAN TANTANGAN BAGI GURU SDN MADANG MUSI RAWAS LEARNING : OPPORTUNITIES AND CHALLENGES FOR TEACHERS OF SDN," vol. 4, no. 5, pp. 559–568, 2025.