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Utilization Of Artificial Intelligence in Preparing Teaching Modules for Madrasah Teachers

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Abstract :
This research aims to improve the digital competence of madrasah teachers in developing teaching modules for the Merdeka Curriculum through the use of Artificial Intelligence. The approach used was descriptive qualitative with a participatory strategy. Data were obtained through participant observation, structured interviews, and documentation during the mentoring process of using ChatGPT as a tool for developing teaching module content. The results of the activity showed a significant increase in teacher understanding, with the proportion of teachers categorized as having "very good" knowledge increasing from 0% in the pre-test to 75% in the post-test. These findings indicate that teachers are able to utilize ChatGPT to develop teaching modules quickly, systematically, and in accordance with the structure of the Merdeka Curriculum. In addition to improving technical skills, this activity also resulted in increased work efficiency, creativity in designing learning, and teacher confidence in using technology. Teachers demonstrated a positive attitude towards the use of Artificial Intelligence while still recognizing the importance of their role in curating and adapting content to the madrasah context and Islamic values. This activity concluded that mentoring the use of Artificial Intelligence that is designed practically and contextually can have a real impact on improving the quality of teaching modules and the readiness of madrasa teachers in implementing the Independent Curriculum.

INTRODUCTION

The digital revolution has brought fundamental changes to the world of education and requires education systems to adapt to the increasingly complex challenges of the 21st century (Alrumayh et al., 2025) . This transformation is not only related to the use of technology as a learning tool, but also involves a paradigm shift in designing, implementing, and evaluating the learning process. In Indonesia, the implementation of the Independent Curriculum encourages teachers to implement differentiated, project-based, and contextual learning according to student needs (Purwowidodo & Zaini, 2023) . This condition requires teachers not only to master conventional competencies but also to possess digital literacy skills to be able to integrate technology effectively into learning (Agustin et al., 2022) .

One of the rapidly developing technological innovations that is beginning to be utilized in the world of education is *Artificial Intelligence* (AI) (Zahara et al., nd) . The presence of AI, particularly through generative language models such as ChatGPT, provides significant opportunities for teachers to develop teaching materials, learning modules, lesson plans, and assessments more efficiently and

systematically (Mundiri et al., 2025) . The use of AI allows teachers to quickly obtain learning references, develop adaptive teaching materials, and tailor learning to students' needs. With AI support, the process of developing learning tools, which was previously complex and time-consuming, can be accelerated without sacrificing learning quality (Sain et al., 2024) .

However, the integration of AI technology into education still faces various challenges, particularly at the elementary and madrasah levels (Irsyad & Zakir, 2023) . The varying levels of digital literacy among teachers, limited training, and minimal technical assistance are major obstacles to optimal AI utilization (Fatmasari et al., 2025) . Consequently, many teachers are unable to develop comprehensive and meaningful teaching modules for the Independent Curriculum, often simply making administrative changes from lesson plans to teaching modules without updating the substance. This situation indicates a gap between the demands of an innovative curriculum and teachers' readiness to implement it in the classroom. (Barus, 2024) .

Several previous studies have shown that teachers still face limitations in their understanding and skills in developing teaching modules based on the new curriculum. This is in line with research conducted by (Taufik et al., 2023) showed that teachers are required to create teaching modules that align with a good independent curriculum. Another study (Amelia, 2023) found that many teachers still struggle to understand how to create teaching modules. Some teachers admitted to having difficulty keeping up with technological developments due to limited digital literacy or feeling technologically illiterate. Yet, teaching modules are essential learning tools designed to incorporate comprehensive learning planning, taking into account the initial abilities, learning styles, and needs of students, as well as the local context of the madrasah (Nisa, 2025) .

Based on these conditions, this research was conducted as an effort to bridge the gap between the demands of the Independent Curriculum and the capabilities of madrasah teachers in developing teaching modules. This activity focuses on mentoring the use of *Artificial Intelligence* , specifically ChatGPT, as a tool for developing teaching module content. Through this activity, it is hoped that madrasah teachers' digital competency will improve, enabling them to develop high-quality, contextual, and student-centered teaching modules, while positively impacting the quality of learning within the madrasah environment.

RESEARCH METHODS

This research uses a descriptive qualitative approach with a participatory strategy to provide an empirical description of the process and results of training in the use of *Artificial Intelligence* in the preparation of teaching modules for madrasa teachers (Pathak et al., 2013). (Irsyad & Zakir, 2023) . The subjects of the activity were teachers at MI Hikmatul Hasanah located in Tigasan Kulon, Leces, Probolinggo Regency, East Java, consisting of grade I–VI teachers and the madrasah principal, totaling eight people. The coaching was carried out in December 2025.

This research was designed through several interconnected stages, namely preparation, implementation (mentoring), and evaluation (Qudratuddarsi et al., 2024) . In the preparation stage, researchers coordinated with the madrasah, identified teacher problems and needs, administered *pre-tests* , and prepared coaching materials related to the use of ChatGPT in developing teaching modules. The implementation stage was carried out face-to-face with a focus on socializing

the concept of *Artificial Intelligence* and demonstrating the use of ChatGPT as a tool to develop teaching module content. The coaching methods used included interactive lectures, step-by-step tutorials, hands *-on practice* , and personal mentoring so that teachers could immediately apply the skills acquired.

After the implementation of the coaching, the activity continues with an evaluation stage involving the provision of *a post-test* to measure the increase in teacher knowledge along with interviews to assess the relevance of the mentoring or prompt material provided, and the quality of the teaching modules produced. (Park & Choo, 2024) . The evaluation aims to ensure the effectiveness of the methods used in achieving program objectives. However, it is important to note that the evaluation instrument was not formally tested for validity or reliability. This *post-test* aims to ensure the sustainability of the application of *Artificial Intelligence technology* in learning practices and encourage teachers to be more confident in utilizing ChatGPT as a tool for creating teaching modules (Mahoklory & Hoda, 2021)

Data collection in this activity was carried out through the implementation of *pre-tests* and *post-tests* , structured interviews, and documentation. *Pre-tests* and *post-tests* were conducted before and after the mentoring process to measure teachers' abilities in creating quality teaching modules using ChatGPT. Structured interviews were conducted with all participants after the mentoring to explore teachers' perceptions regarding the benefits of the activity, level of satisfaction, ease of use of the technology, and its impact on the development of teaching modules. In addition, documentation in the form of photos of activities and examples of teaching modules produced by teachers were collected as supporting data for the implementation and results of the research activities.

Data analysis was carried out descriptively and qualitatively by examining the *pre-test results. post-test* , interview results, and collected documentation (Susanto et al., 2025) . The data were analyzed by categorizing the main findings related to improving teacher competency, perceived ease in preparing teaching modules, emerging challenges, and the impact of the use of *Artificial Intelligence* on the quality of teaching modules. Direct quotes from the interview results were used to strengthen the research findings, while data validity was maintained through source triangulation by comparing the results of observations, interviews, and documentation, as well as through team discussions in drawing conclusions so that the results of the activity could be scientifically accounted for.

RESULTS AND DISCUSSION

Research results show that mentoring on the use of *Artificial Intelligence* at MI Hikmatul Hasanah has a positive impact on improving the competence of madrasah teachers in developing teaching modules. In the initial stages of mentoring, some teachers showed doubt and lacked confidence because they had never interacted with *Artificial Intelligence chatbot-based technology*. However, after being given a simple explanation of the basic concepts of AI and how ChatGPT works, teachers began to understand the function of the technology and were able to use it as a tool in developing teaching modules. Teachers were trained to write simple prompts, which then produced a teaching module framework quickly and systematically, including learning objectives, main material, learning activities, and assessments.

During the mentoring process, teachers not only received ChatGPT output directly but were also trained to curate and adapt content. Teachers revised the resulting draft teaching modules by incorporating the local context of the madrasah,

student characteristics, and relevant Islamic values and local wisdom. This process demonstrated that the use of *Artificial Intelligence* encourages teachers to think critically and reflectively, and positions AI as an assistant, not a substitute for the teacher (Muhamad, 2025) . After the mentoring, teachers were able to develop teaching modules that were more systematic and aligned with the Merdeka Curriculum structure compared to those developed before the mentoring.

Table 1. Pre-Test and Post-Test Evaluation Materials

Indicator	Instrument Type	Number of Questions	Question Details
Understanding the basic concepts of creating teaching modules	Pre-test	6	Understanding teaching modules, functions of teaching modules, components of teaching modules
Preparation of learning objectives and teaching materials	Pre-test	6	Formulation of learning objectives, suitability of material, relevance of competencies
Design of teaching module structure	Pre-test	5	Arrangement of module sections, sequence of activities, logical flow of learning
Basic knowledge of using AI in module development	Pre-test	5	Utilization of AI, examples of use, potential AI support in learning
Total Pre-test Questions		**22**	
Perception of program impact on increasing understanding	Post-test	3	Understanding increased after mentoring, clarity of material, relevance of activities
Improving the ability to compile AI-based teaching modules	Post-test	3	Skills increase, ease of practice, confidence increases
Interest and readiness to apply AI in learning	Post-test	2	Willingness to try, sustainability of AI use
Total Post-test Questions		**8**	

After completing *the pre-test* , the activity continued with guidance on understanding *Artificial Intelligence concepts* and a demonstration of using ChatGPT as a tool for developing teaching module content, accompanied by independent practice sessions and direct guidance. The guidance included interactive lectures, step-by-step tutorials, hands-on practice, and personal mentoring so teachers could immediately apply the skills they had acquired.

Another direct impact felt by teachers is the time efficiency in developing teaching modules. While previously it took teachers considerable time to manually develop teaching modules, after participating in the mentoring program, they were able to design teaching modules in a shorter time and with better quality. Teachers stated that ChatGPT helped them quickly acquire ideas, structures, and learning references. This demonstrates that the integration of *Artificial Intelligence* contributes to increasing teacher effectiveness in responding to the demands of the Independent Curriculum (Muis et al., 2025) .

This activity was also supported by visual documentation in the form of mentoring photos that represent the active involvement of teachers during the activity. The documentation shows a collaborative mentoring atmosphere, where

teachers actively tried to write prompts in ChatGPT and discussed the results obtained. The enthusiasm and active participation of teachers recorded in the documentation proves that the applied and participatory training approach is effective in increasing teacher confidence in trying and utilizing new technologies.

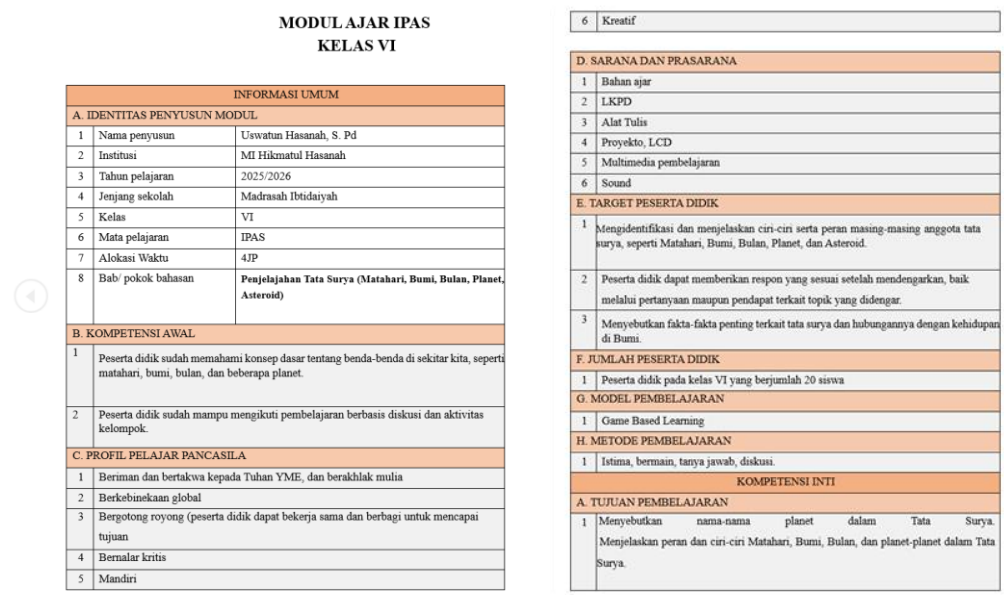
Figure 1. Mentoring Creating AI- Based Teaching Modules

The evaluation phase is the final phase of the teaching module development program, which aims to assess the effectiveness of program implementation, the achievement of its objectives, and the impact of the activities on teachers. A comprehensive evaluation was conducted using quantitative and qualitative instruments to capture improvements in teachers' knowledge and understanding of developing quality teaching modules based on *Artificial Intelligence.* In this context, the evaluation focused on *pre-* and *post-test results* , which measured participants' level of understanding before and after the mentoring session

Table 2. Pre-Test and Post-Test Results AI-Based Teaching Module Creation Program

Knowledge Level	Initial Test (N)	Initial Test (%)	Final Test (N)	Final Test (%)
Very good	0	0.0	6	75.0
Good	3	37.5	2	25.0
Bad	4	50.0	0	0.0
Very bad	1	12.5	0	0.0
Total	**8**	**100**	**8**	**100**

Based on Table 2, there was a significant increase in teachers' knowledge levels after the mentoring. During *the pre-test* , no teachers demonstrated a “very good” level of understanding (0%), while 37.5% fell into the “good” category. Conversely, most participants fell into the “poor” (50%) and “very poor” (12.5%) categories. This indicates that most teachers had limited knowledge and understanding of creating high-quality AI-based teaching modules before the mentoring. However, after the intervention, which consisted of mentoring, interactive interviews, and evaluation of results, the post-test showed substantial improvement, with 75% of teachers achieving a “very good” level of understanding and 25% falling into the “good” category. Overall, 100% of teachers demonstrated good to excellent understanding after participating in the mentoring.



MODUL AJAR IPAS
KELAS VI

INFORMASI UMUM		
A. IDENTITAS PENYUSUN MODUL		
1	Nama penyusun	Uswatun Hasanah, S. Pd
2	Institusi	MI Hikmatul Hasanah
3	Tahun pelajaran	2025/2026
4	Jenjang sekolah	Madrasah Ibtidaiyah
5	Kelas	VI
6	Mata pelajaran	IPAS
7	Alokasi Waktu	4JP
8	Bab/ pokok bahasan	**Penjelajahan Tata Surya (Matahari, Bumi, Bulan, Planet, Asteroid)**
B. KOMPETENSI AWAL		
1	Peserta didik sudah memahami konsep dasar tentang benda-benda di sekitar kita, seperti matahari, bumi, bulan, dan beberapa planet.	
2	Peserta didik sudah mampu mengikuti pembelajaran berbasis diskusi dan aktivitas kelompok.	
C. PROFIL PELAJAR PANCASILA		
1	Beriman dan bertakwa kepada Tuhan YME, dan berakhlak mulia	
2	Berkebinekaan global	
3	Bergotong royong (peserta didik dapat bekerja sama dan berbagi untuk mencapai tujuan	
4	Bernalar kritis	
5	Mandiri	
6	Kreatif	

D. SARANA DAN PRASARANA	
1	Bahan ajar
2	LKPD
3	Alat Tulis
4	Proyekto, LCD
5	Multimedia pembelajaran
6	Sound
E. TARGET PESERTA DIDIK	
1	Mengidentifikasi dan menjelaskan ciri-ciri serta peran masing-masing anggota tata surya, seperti Matahari, Bumi, Bulan, Planet, dan Asteroid.
2	Peserta didik dapat memberikan respon yang sesuai setelah mendengarkan, baik melalui pertanyaan maupun pendapat terkait topik yang didengar.
3	Menyebutkan fakta-fakta penting terkait tata surya dan hubungannya dengan kehidupan di Bumi.
F. JUMLAH PESERTA DIDIK	
1	Peserta didik pada kelas VI yang berjumlah 20 siswa
G. MODEL PEMBELAJARAN	
1	Game Based Learning
H. METODE PEMBELAJARAN	
1	Istima, bermain, tanya jawab, diskusi.
KOMPETENSI INTI	
A. TUJUAN PEMBELAJARAN	
1	Menyebutkan nama-nama planet dalam Tata Surya. Menjelaskan peran dan ciri-ciri Matahari, Bumi, Bulan, dan planet-planet dalam Tata Surya.

Figure 2. AI-based teaching module

The research indicates that there is consistency with various previous studies highlighting the potential of *Artificial Intelligence* in improving teachers' pedagogical competence. Research (Juni et al., 2025) showed that teaching materials compiled with the help of ChatGPT have a clearer and more systematic structure, which is also reflected in the teaching modules produced by MI Hikmatul Hasanah teachers after mentoring. This finding is also in line with (Aini et al., 2025) who reported that the use of ChatGPT can optimize teachers' time in developing learning modules, and with (Siregar, 2025) who found an increase in teacher confidence after participating in AI mentoring. The difference and uniqueness of this activity lies in the context of Islamic elementary schools, where AI integration is not only focused on pedagogical efficiency and quality, but also on adapting to Islamic values and local wisdom. Overall, this discussion confirms that the integration *of Artificial Intelligence* in the preparation of teaching modules, if supported by appropriate and continuous mentoring, can have a positive impact on improving teacher competence and the quality of learning in the madrasa environment (Zohaib Hassan, 2025).

Overall, the results of this activity indicate that the use of *Artificial Intelligence* through ChatGPT can improve the competence of madrasah teachers in developing quality teaching modules. Teachers not only experienced improved technical skills but also changes in attitudes and confidence regarding the use of technology in learning. The resulting teaching modules demonstrated improvements in pedagogical structure and content, and supported teachers' readiness to implement differentiated and contextual learning according to the Independent Curriculum. These findings confirm that AI assistance designed in a practical, contextual, and sustainable manner can have a real impact on improving the quality of learning in madrasah environments.

CONCLUSION

The assistance in utilizing *Artificial Intelligence* ChatGPT at MI Hikmatul Hasanah has been proven to have a positive impact on improving the digital competence of madrasah teachers. Teachers are able to utilize ChatGPT to compile teaching module content quickly, systematically, and in accordance with the structure of the Independent Curriculum. Through a series of activities, including *pre-tests*, mentoring, interactive interviews, and *post-test evaluations*, teachers showed significant improvements. Based on the evaluation results, the proportion of participants with "very good" knowledge increased from 0% in the pre-test to 75% in the *post-test.* Conversely, the proportion of participants in the "poor" category, which initially reached 50% in *the pre-test,* decreased to 0% in *the post-test.* These findings indicate that the mentoring intervention has a real positive impact on improving participant understanding. These findings indicate an increase in teacher work efficiency, creativity in designing learning, and increased teacher confidence in using technology.

Based on the results of these activities, it is recommended that mentoring on the use of *Artificial Intelligence* in developing teaching modules be expanded to other madrasas and schools and implemented on an ongoing basis. Institutional and policy support are crucial for the program's sustainability, particularly in providing supporting infrastructure such as stable internet access, information and communication technology devices, and policies that encourage teacher innovation. Furthermore, further mentoring needs to be developed with a broader scope, such as deepening other AI features, utilizing e-learning platforms, and integrating AI into learning assessments, so that teachers are better prepared for future developments in educational technology.

Although this activity has shown positive results, several aspects remain unanswered and require further study. Future research could focus on measuring the long-term impact of AI utilization on student learning outcomes, exploring more sustainable AI training models, and examining the ethics of using *Artificial Intelligence* in madrasah settings. Furthermore, further research could be conducted with a broader range of subjects and more diverse approaches to strengthen empirical evidence regarding the effectiveness of AI integration in values-based education and local wisdom.

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