Edukasi Islami: Jurnal Pendidikan Islam, VOL: 14/No: 04 November 2025 **P-ISSN: 2252-8970**
DOI: 10.30868/ei.v14i04.9210 **E-ISSN: 2581-1754**

Date Received	**:**	**September 2025**
Date Revised	**:**	**December 2025**
Date Accepted	**:**	**December 2025**
Date Published	**:**	**December 2025**

EXPLORING THE EXPERIENCES OF TEACHERS AND MI STUDENTS IN USING AI-BASED TECHNOLOGY TO IMPROVE DIGITAL LITERACY AND PEDAGOGICAL COMPETENCE

Arif Mustofa[1]
ISQI Sunan Pandanaran Yogyakarta, Indonesia (arifmustaispa@gmail.com)

Ajeng Lilananda Fajrin
ISQI Sunan Pandanaran Yogyakarta, Indonesia (ajenglilanandafajrin@gmail.com)

Keywords:
Globalization, Education, Technology, Artificial Intelligence, Competence Pedagogy, Digital Literacy, Elementary School,

ABSTRACTS

Background: *The digital era, technology, especially artificial intelligence (AI), plays a crucial role in education, including at the elementary and secondary levels. Applications such as ChatGPT are considered capable of improving the quality of learning through interactive features tailored to student needs.* ***Purpose:*** *However, the application of AI in Islamic elementary schools (MI) remains limited, particularly in its impact on teachers' pedagogical competence and students' digital literacy.* ***Method:*** *This study employed a qualitative approach to explore and understand the experiences and perceptions of teachers and students at Islamic elementary schools (Madrasah Ibtidaiyah) regarding the use of artificial intelligence (AI)-based technology, specifically ChatGPT, in learning to improve students' digital literacy and teachers' pedagogical competence.* ***Result:*** *The results of this study, including the implementation of an AI technology workshop at MI Bina Umat, demonstrated an increase in teachers' competence in planning and implementing adaptive learning.* ***Conclusion:*** *The use of Canva and ChatGPT proved effective in developing interactive media and preparing learning evaluations. Furthermore, students' digital literacy also improved, as evidenced by their ability to independently use digital information and utilize AI to support the learning process.* ***Implication:*** *The integration of AI in elementary schools is an innovative solution to address the challenges of modern education.*

[1] Correspondence author

A. INTRODUCTION

In the current digital era, technology plays an increasingly significant role in almost all aspects of life, including education. With the rapid development of technology, education systems around the world are striving to adapt to changing times. One form of technology that is now widely used in education is artificial intelligence (AI). The use of AI in education, particularly at the primary and secondary levels, is increasingly considered important for preparing students to face the challenges of the 21st century. AI technologies, such as applications like ChatGPT, have been shown to contribute to improving the quality of learning through various interactive features that can be tailored to individual students' needs. Nevertheless, the implementation of these technologies in Madrasah Ibtidaiyah (MI) in Indonesia remains relatively limited and underexplored, particularly in terms of their impact on teachers' pedagogical competence and the enhancement of students' digital literacy. (Lutfi, 2024)

In the context of education, artificial intelligence (AI) refers to the use of computer systems that can mimic or simulate human intelligence, including automatic feedback, interaction with students, and the analysis and presentation of learning materials adaptively. One AI application that has become increasingly popular is ChatGPT and design tools such as Canva, which are designed to interact with users in natural conversational form, provide responses based on large datasets, and facilitate the creation of visual teaching materials. In education, these technologies offer convenience in providing more personalized and relevant learning materials for students and delivering rapid feedback appropriate to their needs. Furthermore, the concept of digital literacy has become a primary concern in 21st-century education. Digital literacy refers to the ability to access, analyze, evaluate, and make decisions based on digital information. Students who are proficient in digital literacy will more easily adapt to a world increasingly based on technology, which demands skills in managing and using information effectively.

Although AI technology offers various potentials for improving education quality, its application in MI still faces several obstacles. A primary issue is the lack of teacher understanding and skills in integrating this technology into the learning process. Teachers at MI generally do not yet possess adequate skills in using AI-based technology, which limits the implementation of such technology in teaching. (Cholissodin, 2020) Additionally, MI students are not yet fully prepared to optimally utilize this technology due to limitations in access, understanding, and digital literacy skills. This problem is further exacerbated by the lack of specific training for teachers on the use of AI in instruction and the inadequate infrastructure in some madrasahs to support such implementation. In this context, it is important to identify how teachers and students experience and perceive the use of AI-based technologies and to what extent these technologies can improve students' digital literacy and teachers' pedagogical competence.

As a response to challenges in improving teachers' pedagogical competence and students' digital literacy, a solution implemented was an Artificial Intelligence (AI)-based technology workshop targeted at educators in MI settings. This activity was carried out at MI Bina Umat, where teachers received intensive training on utilizing AI technologies, such as ChatGPT and Canva, to support the learning process. Students were also directly involved in AI-based learning activities. The approach aimed to strengthen teachers' capacity to design more adaptive learning and to promote the

development of students' digital literacy skills. The results of this initiative indicate that integrating AI technology into learning activities has significant potential to increase teaching effectiveness and enrich students' learning experiences through more contextual and relevant approaches to contemporary developments.

Current AI technologies in education have been extensively researched and applied in various countries, particularly in higher education. Several studies indicate that the use of AI in instruction can accelerate learning processes, provide quicker feedback, and facilitate more personalized learning. For example, a study by Waluyo et al. (2024) shows that employing AI in teaching not only assists students in improving academic skills but also enhances teacher–student interaction and makes the learning process more efficient and enjoyable. However, research on AI application in MI in Indonesia is still limited. Most previous research has focused on public schools or higher education. Therefore, this study aims to fill that gap by examining the implementation of AI technologies, particularly ChatGPT and Canva, in the MI context.

There is a gap in the literature concerning the implementation of AI technologies in MI, both from the perspective of students' digital literacy and teachers' pedagogical competence. Although many studies investigate the benefits of AI in education, the majority focus on public schools or higher education. Research that focuses on MI—an educational context with unique characteristics within Indonesia's Islamic education system—remains scarce. In addition, most prior studies have measured the effectiveness of AI-based technologies quantitatively without deeply exploring the experiences and perceptions of technology users, namely teachers and students. Therefore, this study concentrates on in-depth understanding of users' experiences in using AI-based technologies.

This research offers a different approach by exploring teachers' and students' experiences and perceptions through in-depth interviews and observation. Using Vygotsky's Social Constructivism Theory (Tohari & Rahman, 2024), particularly the concept of the Zone of Proximal Development (ZPD), this study views AI technology as a more knowledgeable other (MKO) that can accompany students to surpass their actual ability levels and reach higher development. Furthermore, this research contributes new insights by focusing on AI application in MI, a context that is underrepresented in Indonesian educational literature.

This study aims to examine the experiences and perceptions of MI teachers and students regarding the use of AI-based technologies, particularly ChatGPT, in learning. It also aims to understand how these technologies contribute to enhancing students' digital literacy and teachers' pedagogical competence. In addition, the study will identify challenges encountered in the application of AI in MI and seek appropriate solutions to optimize its use in learning.

This research is crucial given the growing need to integrate technology into education, especially at the Madrasah Ibtidaiyah level. By improving students' digital literacy and teachers' pedagogical competence through AI application, education in Madrasah Ibtidaiyah can be better prepared to face the challenges of education in the digital era. The study will provide valuable insights for policy makers, educators, and education managers in developing policies and strategies for implementing technology in madrasah learning.

Based on the background described above, the research question for this study is: How do teachers and students at Madrasah Ibtidaiyah experience and perceive the

use of AI-based technology, particularly ChatGPT, in learning, and how does this technology affect students' digital literacy and teachers' pedagogical competence?

B. METHOD

Dalam penelitian ini, pendekatan yang digunakan adalah pendekatan kualitatif dengan tujuan untuk menggali dan memahami pengalaman serta persepsi guru dan siswa Madrasah Ibtidaiyah terkait penggunaan teknologi berbasis kecerdasan buatan (AI), khususnya ChatGPT, dalam pembelajaran untuk meningkatkan literasi digital siswa dan kompetensi pedagogik guru. Pendekatan kualitatif dipilih karena penelitian ini bertujuan untuk mengeksplorasi dan mendalami konteks serta pemahaman subjektif yang diperoleh dari pengalaman individu.(Mukhlis, 2024)

Subjek penelitian ini terdiri dari dua kelompok utama: 1. Guru-guru Madrasah Ibtidaiyah yang mengikuti workshop pelatihan teknologi berbasis AI. Mereka adalah para pendidik yang terlibat langsung dalam proses penggunaan ChatGPT dalam pembelajaran. Guru-guru ini akan memberikan wawasan terkait dengan penggunaan teknologi AI dalam meningkatkan kompetensi pedagogik mereka, serta tantangan yang mereka hadapi dalam proses penerapannya di kelas. 2. Siswa Madrasah Ibtidaiyah kelas 4 dan 5 yang terlibat langsung dalam penggunaan teknologi AI (ChatGPT) sebagai media pembelajaran. Siswa-siswa ini diharapkan memberikan pandangan mengenai pengalaman mereka dalam menggunakan teknologi AI untuk meningkatkan keterampilan literasi digital mereka, termasuk tantangan dan manfaat yang mereka rasakan selama proses pembelajaran.

Objek penelitian ini adalah pengalaman dan persepsi dari para guru dan siswa Madrasah Ibtidaiyah dalam menggunakan teknologi berbasis AI (ChatGPT). Fokus objek penelitian adalah: 1.Penggunaan teknologi AI dalam pembelajaran, termasuk bagaimana teknologi ini digunakan oleh guru dalam menyampaikan materi dan oleh siswa dalam berinteraksi dengan materi ajar. 2. Peningkatan kompetensi pedagogik guru yang tercermin melalui kemampuan mereka dalam memanfaatkan teknologi AI untuk mendukung proses pembelajaran.

3. Peningkatan literasi digital siswa, yang mencakup keterampilan siswa dalam mengakses, menganalisis, dan menggunakan informasi digital, serta kemampuan mereka dalam berinteraksi dengan sistem berbasis AI seperti ChatGPT.

C. RESULT AND DISCUSSION

Use of AI technology in learning.

The workshop at Bina Umat Elementary School (MI) has provided a strong foundation for planning Artificial Intelligence (AI)-based learning. This activity is the first step in preparing teachers to utilize technology effectively in delivering material, while also equipping students to be able to interact actively with digital-based teaching materials. In the context of elementary education, teachers have an important responsibility to adapt the use of technology to the level of cognitive development of students. This is because the mindset of children at the elementary school level is still concrete, so the approach used must be contextual and easy to understand. (Narayani, 2019). One of the biggest challenges in the world of education is the different ways and speeds of learning in each individual. For example, some students are stronger in the left brain. While others have higher intelligence in areas that rely on the brain. There

are also people who have to face physical and mental obstacles in the learning process. This heterogeneous background of students can be a problem for some. The following are several artificial intelligence virtual devices that can be utilized in the world of education. (Abidin, n.d.)

Personalized Learning is a form of Artificial Intelligence (AI) technology that has been widely adopted in education. This approach allows each student to receive a learning experience tailored to their individual needs and characteristics. Through an AI-based system, data from student learning activities is collected, analyzed, and used to generate relevant and specific learning recommendations. This technology can automatically suggest appropriate learning content, organize learning schedules, and provide various alternative solutions to support the achievement of student learning goals. Thus, AI acts as a personal learning assistant that continuously learns and adjusts learning strategies to be more optimal, efficient, and effective. For teachers, the presence of a Personalized Learning system is very helpful in designing and providing teaching materials. This technology can enrich available learning resources and facilitate teachers in providing interventions or mentoring according to student needs. Thus, the integration of Personalized Learning into learning practices not only increases the efficiency of the teaching and learning process but also supports a more meaningful, learner-centered learning approach. (Winarno, 2024)

One of the innovations in the field of digital education is Rumah Belajar, an online learning portal developed by the Ministry of Education and Culture of the Republic of Indonesia. This platform provides various educational content that can be accessed by students from the Early Childhood Education (PAUD) level up to Senior High School (SMA) and Vocational High School (SMK). The main features offered by Rumah Belajar include: learning resources, electronic textbooks, question banks, virtual laboratories, cultural maps, and various other educational content.

The existence of Rumah Belajar enables equal access to digital learning materials, which can be used by teachers and students across all regions of Indonesia. In addition, the application of Computer-Assisted Instruction (CAI) also enriches teaching methods. CAI refers to the use of computers as tools to facilitate and improve the effectiveness of the learning process. This technology integrates various media such as text, graphics, audio, and video into one interactive system, thus encouraging active student engagement in the learning process. The main goal of CAI is to create a more engaging and effective learning experience through an interactive multimedia approach that adapts to students' needs. With the integration of digital platforms like Rumah Belajar and CAI methods, the education system is expected to provide a more flexible, adaptive learning experience aligned with technological advancements and the characteristics of 21st-century learners (Chassignol et al., 2018). Third, Computer-Assisted Education (CAI) refers to the use of computers as tools to facilitate and enhance teaching. CAI employs a combination of text, graphics, sound, and video to improve the learning process. It aims to make the learning process better for students through interactive activities (Chanda Halim & Hendri Prasetyo, 2018).

Khan Academy is one of the online learning platforms that provides free learning resources for students, teachers, and parents. This application is designed to support independent learning by providing various features such as practice exercises, quizzes, and tests that can be used to train and continuously measure students' understanding.

In addition, Khan Academy is also equipped with instructional videos that explain the material systematically, making it easier for students to grasp the concepts being taught.

From the educator's perspective, this application provides support in the form of reporting and learning analytics features specifically designed for each class. Teachers can easily assign lessons, especially in mathematics, by aligning them with the chosen curriculum. Students' learning progress can also be monitored through automatic reports provided by the system.

The main advantages of Khan Academy compared to other learning applications lie in its systematically structured material, classified by topic and grade, simple yet engaging content delivery, and the presence of simultaneous quizzes and tests that enable real-time measurement of student understanding. In addition, access to this application is relatively easy and user-friendly, making it an effective alternative digital learning resource to support the strengthening of digital literacy among students (Soebagyo, 2016).

Kejarcita Application. Kejarcita is an application that focuses its services and features on providing school question banks for elementary school students (Rahadiantino, 2022). Its main features include access to interactive learning videos, material summaries, worksheets, Q&A features, attendance, announcements, and management. It also offers practice questions and exams with scoring systems, as well as automatic performance and ranking. Some benefits obtained include: teachers can more easily assign tasks or materials online, use the application for free by entering an email address, provide assessments, and students can learn through engaging and creative learning videos. The advantages of using the Kejarcita application are its ease of access, most features being free to use, curriculum alignment with schools, and the practicality of creating quizzes and exams. However, one drawback of Kejarcita is that it has premium features that cannot be accessed for free.

Improvement of Students' Digital Literacy

The improvement of students' digital literacy at MI Bina Umat is reflected in the results of interviews conducted with teachers and students, as well as through observations. Based on these findings, students demonstrated positive progress in skills such as accessing digital information, critically understanding content, and utilizing AI-based technologies such as ChatGPT to support their learning process. Teachers also observed that students became more active and confident in using digital devices, which indicates an overall enhancement in digital literacy knowledge and skills.

The presence of Artificial Intelligence (AI) technologies such as ChatGPT offers great potential for improving students' digital literacy. (Prambudi & Sinaga, 2025) AI systems allow for personalized, interactive, and responsive learning experiences tailored to individual needs. ChatGPT, as one of the AI-based language models, can answer students' questions, help explain concepts in diverse ways, and encourage further exploration of information. This aligns with the concept of Personalized Learning, which enables the adjustment of materials to students' learning styles and paces. It encompasses students' skills in accessing, analyzing, and using digital information, as well as their ability to interact with AI-based systems such as ChatGPT. (Ruyat et al., 2024)

The use of Generative Pre-trained Transformer (ChatGPT) in human-computer interaction today presents unique challenges while becoming increasingly popular,

especially in the field of education, as conveyed by (Oktavia & Suseno, n.d.). This statement is further reinforced by (Abidin, n.d.), who emphasized that in the context of academia and education, the utilization of ChatGPT can contribute to improving learning effectiveness by providing access to broader and more easily understood information and materials.

Improvement of Teachers' Pedagogical Competence

Teachers' competence is reflected through their ability to utilize AI technology to support the learning process. The results of the Workshop at MI Bina Umat Moyudan proved that AI technology, particularly the use of ChatGPT and Canva, can serve as an effective solution in helping teachers enhance the quality of classroom learning. Through this training, teachers were able to take advantage of AI technology to design adaptive learning tools and evaluation instruments in accordance with the evolving curriculum demands. (Naufal & Pratiwi, n.d.)

The use of Canva as a tool to develop visual learning media allows teachers to design more interactive materials, which in turn can increase students' motivation and participation in the learning process. Previous studies have shown that the use of interactive visual media can enhance students' memory and deepen their understanding of the concepts being taught. (Rohmiasih et al., 2023) This also corresponds with evaluation results indicating that teachers perceived learning media produced with Canva to be more effective and easier for students to understand. (Tri Wulandari & Adam Mudinillah, 2022)

In addition, ChatGPT, as a tool for automatically generating evaluation questions, helps teachers create more varied and relevant assessments, thereby saving time in exam preparation. Another advantage of using ChatGPT is its ability to provide instant feedback to students, which is one of the essential elements of effective learning. With the implementation of AI, teachers can focus more on direct teaching and guidance for students, while administrative tasks such as test creation can be automated. (Waluyo et al., 2024)

CONCLUSION

The implementation of AI technologies through ChatGPT and Canva in fifth-grade classes at MI Bina Umat made a significant contribution to improving the quality of teaching and learning. Students became more active, creative, and critical, while teachers were assisted in creating engaging and interactive learning environments. Although technical challenges remain, the perceived benefits are far greater. Going forward, continued development of teachers' digital competencies and provision of supporting infrastructure need to be prioritized to ensure that this learning transformation runs optimally.

Thus, improvements in digital literacy in sixth grade are not only visible in technical mastery but also in critical, creative, ethical, and collaborative aspects of technology use. This aligns with 21st-century learning objectives, where students are not merely technology users but active learners who are intelligent, prudent, and responsible in the digital world.

Improvements in teachers' pedagogical competence in the digital era are marked by the ability to effectively utilize AI technologies such as ChatGPT and Canva in

designing, implementing, and evaluating learning, as reflected in the workshop results at MI Bina Umat Moyudan, which demonstrated significant advances in applying innovative and adaptive teaching strategies.

REFERENCES

Abidin, M. A. (T.T.). Implementasi Teknologi Artificial Intelligence (Ai) Untuk Mendukung Pembelajaran Siswa Di Madrasah Ibtidaiyah Kecamatan Krembung Sidoarjo.

Chanda Halim & Hendri Prasetyo. (2018). Penerapan Artificial Intelligence Dalam Computer Aided Instructure(Cai). Jurnal Sistem Cerdas, 1(1), 50–57. Https://Doi.Org/10.37396/Jsc.V1i1.6

Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A. (2018). Artificial Intelligence Trends In Education: A Narrative Overview. Procedia Computer Science, 136, 16–24. Https://Doi.Org/10.1016/J.Procs.2018.08.233

Cholissodin, I. (2020). Buku Ajar Ai, Machine Learning & Deep Learning. Machine Learning.

Lutfi, A. M. (2024). Analisis Dampak Teknologi Artificial Intelligence (Ai) Terhadap Kualitas Pembelajaran Matematika.

Mukhlis, M. (2024). Persepsi Guru Terhadap Pemanfaatan Chatgpt Dalam Mengembangankan Soal Literasi Membaca: Studi Kasus Pada Sekolah Menengah Di Provinsi Riau. Jurnal Pendidikan Dan Kebudayaan, 9(1), 1–19. Https://Doi.Org/10.24832/Jpnk.V9i1.4873

Narayani, N. Pt. U. D. (2019). Pengaruh Pendekatan Matematika Realistik Berbasis Pemecahan Masalah Berbantuan Media Konkret Terhadap Hasil Belajar Matematika. Jurnal Ilmiah Sekolah Dasar, 3(2), 220. Https://Doi.Org/10.23887/Jisd.V3i2.17775

Naufal, M. A., & Pratiwi, A. C. (T.T.). Peningkatan Kompetensi Guru Dalam Penggunaan Teknologi Ai Untuk Pengembangan Media Pembelajaran Dan Evaluasi Di Kabupaten Jeneponto.

Oktavia, D. H., & Suseno, G. (T.T.). Pemanfaatan Kecerdasan Buatan Dalam Pendidikan Di Indonesia: Potensi Dan Tantangan.

Prambudi, A. R., & Sinaga, F. M. (2025). Penggunaan Chat Gpt Sebagai Alat Bantu Dalam Proses Pembelajaran Dan Implikasinya Terhadap Motivasi Belajar Mahasiswa. 6.

Rahadiantino, L. (2022). Implementasi Pembelajaran Artificial Intelligence Bagi Siswa Sekolah Dasar Di Kota Batu, Malang, Jawa Timur. Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar, 6(1). Https://Doi.Org/10.24036/Jippsd.V6i1.115857

Rohmiasih, C., Rohmiati, C., & Sartika, S. (2023). Pemanfaatan Media Pembelajaran Canva Sebagai Upaya Mewujudkan Transformasi Pendidikan.

Ruyat, R., Jatiwahyuni, L., & Suroso, J. S. (2024). Student Perceptions Of Chatgpt Integration In The Digital Age. Sebatik, 28(2). Https://Doi.Org/10.46984/Sebatik.V28i2.2533

Soebagyo, J. (2016). Pemanfaatan Web Khan Academy Dalam Pembelajaran Matematika. 5(1).

Tohari, B., & Rahman, A. (2024). Konstruktivisme Lev Semonovich Vygotsky Dan Jerome Bruner: Model Pembelajaran Aktif Dalam Pengembangan Kemampuan Kognitif Anak. Nusantara: Jurnal Pendidikan Indonesia, 4(1), 209–228. Https://Doi.Org/10.14421/Njpi.2024.V4i1-13

Tri Wulandari & Adam Mudinillah. (2022). Efektivitas Penggunaan Aplikasi CANVA Sebagai Media Pembelajaran IPA MI/SD. Jurnal Riset Madrasah Ibtidaiyah (JURMIA), 2(1), 102–118. Https://Doi.Org/10.32665/Jurmia.V2i1.245

Waluyo, U., Soepriyanti, H., & Fitriana, E. (2024). Pemanfaatan Artificial Intelligence (AI) Sebagai Sistem Pendukung (Supporting System) Kegiatan Intrakurikuler Di SMAN 1 Montong Gading – Lombok Timur.

Winarno, W. (2024). Implementasi Personalized Learning Menggunakan Litercy Ict Digital: Sebuah Systematic Literatur Review. Hinef : Jurnal Rumpun Ilmu Pendidikan, 3(1), 26–37. Https://Doi.Org/10.37792/Hinef.V3i1.1169