

# The Role of Artificial Intelligence (AI) as Learning Style Master of Student in Digital Era

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**Abstract:** Artificial Intelligence (AI) is the one of popular technology in the world of education in the digital era. AI is a system used to imitate human intelligence or dead object with the use of sophisticated technology to accomplish human cognitive problems. But the usage of AI has a significant impact that is problems of privacy and data security, as well as ethics and society. Because of this, the usage of AI has to do wise and precise to produce a maximum advantage for improving education. The article aims to analyze the role of AI in helping student assignments. This research used a descriptive qualitative approach and the data was reached by a Google form questionnaire. This research used data from a questionnaire via Google form given to the master of student Islamic Education UIN Sunan Kalijaga Yogyakarta semester 1 2022/2023. , the data was obtained via Google form and then, the link was disseminated by Whatsapp. The primary data of research earned by Google from respondents. The data analysis used a statistical description. Referring to the technique, the researcher only describes the data that has been collected without the intention of concluding. The result showed 73,4% of respondents used AI for doing assignments, and 26.7% of respondents used not AI for doing assignments.

**Keywords:** Artificial Intelligence (AI), Era Digital, Learning Style

## Introduction

Technological advances have made education experience a significant digital transformation. Online learning platforms, educational applications and other technology-based solutions also play an important role in providing access and increasing learning efficiency. Technological advances in the last few decades, especially in the field of artificial intelligence (AI), have taken an increasingly dominant role in various sectors, including education. In this context, the relationship between students and AI becomes increasingly important and interesting to research.

Artificial Intelligence (AI) can be likened to the brain of a robot (Gunagama & Lathifa, 2017) . Overall, the discussion about AI is quite broad and varied because the elements that make up AI technology are not studied using one point of view, but from various points of view. (Hidayanti & Azmiyanti, 2023) . AI is a system that shows

intelligent behavior in achieving a certain goal, the implementation of which is in the form of a stand-alone computer program or embedded in hardware that has a specific use (Hidayanti & Azmiyanti, 2023) . The current generation needs to take advantage of developments in digital technology which have an impact on making everyday life easier (Alia, 2018) . Students are agents of change who absolutely must be developed through increasing competence through education and teaching (Sari et al., 2023) . The learning process in the context of the application of science, technology and skills is carried out to improve student quality which functions to produce outputs and outcomes that are beneficial to education (Setiawan et al., 2023) .

The existence of AI has had a significant impact on the world of education (Latifah & Ngalimun, 2023) . With its ability to analyze and process data, AI has provided innovative solutions and enabled a more personalized and adaptive learning

approach (Nurbayanni et al., 2023) . In the context of the relationship between students and AI, there are several aspects that are worth exploring. *First*, the use of AI in learning can influence students' motivation and interest in learning (Suyedi & Idrus, 2019) . With sophisticated technology, students can access learning material in a more interactive and interesting way. Apart from that, AI's ability to provide instant feedback can also influence the student learning process (Kennedy, 2023) .

*Second*, it is important to consider the ethical and social implications of using AI in education. In this context, questions about data privacy, fairness of access, and the impact of replacing humans by machines become relevant. Students also need to understand how AI operates, its limits, and how to utilize it responsibly. Because although AI offers various opportunities to improve learning, there are also challenges such as privacy and ethical issues that students must be aware of. *Third*, studies of students' relationship with AI can also provide insight into students' preparation for an increasingly automated world of work. Students need to develop skills and knowledge relevant to AI technology to prepare themselves to face future challenges.

Discussions about artificial intelligence are currently of interest to researchers, including those in the educational realm. The author found several studies on artificial intelligence, including: Research conducted by Ismaila Temitayo Sanusi et al on The role of learners' competencies in Artificial Intelligence Education (Sanusi et al., 2022) . The research results show that it reveals the importance of teamwork and the importance of human collaboration tools in artificial intelligence literacy through course content. These findings emphasize the importance of teamwork among students to keep up with the pace of technological development. Multigroup analysis also did not show significant differences between gender and school type.

Furthermore, research was conducted by Agung Rinaldy Malik on Exploring Artificial Intelligence in Academic Essay: Higher Education Student's Perspective (Malik et al., 2023) . The findings show positive reception of the AI-powered writing tool,

with students recognizing its benefits in grammar checking, plagiarism detection, language translation, and essay outlines. AI was found to improve students' writing skills, self-efficacy, and understanding of academic integrity. However, some students expressed concerns about the potential impact on creativity, critical thinking, and ethical writing practices. The study emphasizes a balanced approach to AI integration, where AI collaborates with human authors, and also identifies popular AI tools used by Indonesian students. Furthermore, research conducted by Miguel Martínez-Comesana on the Impact of artificial intelligence on assessment methods in primary and secondary education: Systematic literature review (Martínez-Comesaña et al., 2023) . The research results show that the main contributions of the application of AI in the assessment of students at lower educational levels focus on predicting their performance, automating and making evaluations more objective through neural networks or natural language processing, the use of educational robots to analyze their learning processes, and detect certain factors that make a class more interesting. This review shows the existing possibilities and uses that AI can bring to the world of education, especially in the evaluation of student performance at primary and secondary levels.

Based on several studies by the researchers above, the author has not found research on the role of artificial intelligence as a student learning style. Therefore, the aim of this research is to conduct research on the role of AI as a student learning style in the digital era. So it is important to investigate this research so that we can find out the extent of AI's role in the digital era as a student learning style.

## Materials and Methods

This research uses a qualitative descriptive research method. The data used in this research is in the form of a questionnaire survey created via Google Form by asking several questions about AI as a student learning style. The stages carried out by the researcher are formulating the problem,

choosing a theoretical basis, making a hypothesis, collecting data, analyzing the data and making conclusions. This research was carried out in the 2nd semester of the Islamic Religious Education master's program at UIN Sunan Kalijaga Yogyakarta. The informants in this research were students of the 2nd semester PAI master's program. Apart from interviews, data collection techniques were using questionnaires. Through the questionnaire, researchers created a Google form and then distributed the link via the WhatsApp application to respondents. The research subjects were students of the 2nd semester PAI master's program from classes A, B, C and D. In this research, the type of data collected was primary data, meaning the data was directly obtained from respondents who filled in the Google form link, so the data obtained was not in doubt. The data analysis technique uses descriptive statistical techniques. With this descriptive statistical technique, the researcher only describes or describes the data that has been collected without the intention of making a conclusion.

## Results and Discussion

### The Role of Artificial Intelligence in Education in The Digital Era

The digital era is the term used for the period where internet technology and information technology develop rapidly. This era is marked by technological developments and significant growth in the sharing of knowledge in an increasingly developing society. Artificial Intelligence (Artificial Intelligence) is a computer science discipline that has the ability to complete tasks with a level of excellence similar to that performed by humans. Meanwhile, in other sources it is explained that Artificial Intelligence is a subfield in computer science that emphasizes the representation of knowledge using symbols rather than numbers, as well as processing information through heuristic methods or certain rules. AI is a technique used to imitate the level of intelligence possessed by humans and inanimate objects to solve various types of problems (Ismawati & Ramadhanti, 2022) . The term Artificial Intelligence was first introduced

in 1956 by McCarthy, who was named "the science and technique of making intelligent machines" (Borges et al., 2021) . In this era, there is a massive integration of data from sensors in physical space and this data is analyzed by artificial intelligence in cyberspace. The results of this analysis are then returned to humans in various forms in the physical environment. Artificial Intelligence has the ability of machines to use algorithms to learn from data, and use what they have learned to make decisions like humans do (Arief & Saputra, 2019) .

In the digital era or Society 4.0 era, AI has played an important role in various aspects of life, especially in the education sector. Along with the acceleration of technological development in the education domain, there has been a significant increase in the use of advanced technology that supports the learning process in this digital era. With increasingly rapid technological growth in the world of education, more and more sophisticated technology can provide support in the learning process in the digital era ( Ismawati & Ramadhanti, 2022) . All companies and educational institutions are intensifying artificial intelligence technology to become a new platform in the industrial revolution. In this case, the school education system has a vital role in preparing global individuals and producing a quality workforce for the future. This change not only affects teaching methods, but more fundamentally, changes the conceptual view regarding the substance of education itself. The application of Artificial Intelligence (AI) in various sectors of life has presented its own challenges for the education sector. Universities are trying to quickly produce graduates with competencies in the AI field in order to meet industry demand. On the other hand, the application of AI has also spread to the education sector, including primary, higher and even professional education. There is a belief that AI can help individuals to learn more effectively and achieve their desired educational goals (David, 2021a) .

There are several applications that utilize the role of AI and can be used in the education sector, including:

1. Chatbot AI can function as a responsive virtual assistant, helping answer questions, providing

guidance or solving problems in real-time. AI can also facilitate discussion and collaboration between students through interactive learning platforms. However, the use of AI in education also involves important challenges and considerations. Clear policies are needed to protect the privacy and security of student data. In addition, factors such as the availability of technological infrastructure, training of lecturers in using AI, and the costs of implementing and maintaining AI systems also need to be considered (Muarif et al., 2023) .

2. Voice Assistant: is an artificial intelligence technology that is popular and often used in various fields, including in the world of education. Examples of well-known voice assistants include Google Assistant (developed by Google), Siri (used in Apple products), Cortana (created by Microsoft) and others. The existence of Google Assistant can help students find material sources, reference questions, access articles, or find books by just using voice commands or mentioning certain keywords (Mutaqin et al., 2023) . Using voice assistants provides students with the opportunity to interact with learning material independently, without having to rely on direct communication with the teacher. So that the educational platform can be accessed anywhere and at any time, students can learn independently without having to worry about confusion, even without guidance from a teacher or tutor (Fitria, 2021a) .
3. Chat GPT : is a variant of the GPT-3 (Generative Pre-trained Transformer 3) model developed by OpenAI. This platform is specific in producing text that resembles human communication in the form of conversation, including translation, text summarization, answering questions, and generating text with little or no special training for each specific task (Wahid et al., 2023). ChatGPT has capabilities that has created great innovation in the academic world and also brought a significant touch of innovation in current technological developments, especially in the context of the use of technology in the field of education (Faiz & Kurniawaty, 2023) . Therefore, expansion and

restructuring in educational methods and systems is needed to integrate a more relevant curriculum (Kim, 2023) .

4. Grammarly: is a cloud-based platform that aims to provide assistance in the writing process in checking spelling, grammar, using punctuation, and maintaining clarity in writing (Sucipto et al., 2023) .
5. Presentation Translator: this technology is similar to Voice Assistant in that it relies on voice interaction to carry out its functions. However, Presentation Translator has special specifications in terms of deciphering or conveying text from one language to another as desired. So users can listen to texts, articles or digital books in the language they choose without having to read them. By using AI Speech Recognition, users can easily understand journals, articles and books from various languages more efficiently and quickly (Mutaqin et al., 2023) .

From the perspective of educational applications, in the last decade many studies on artificial intelligence in education stated that there are four roles of AI in education, namely (Hwang et al., 2020) :

1. Smart Tutor, is a category that has a big role in education. What is included in this category is an intelligent tutoring system, an adaptive/personalized learning system or a recommendation system. Several meta-analytic studies have shown the effectiveness of intelligent learning systems in improving learning outcomes. Cognitive Tutor, which was developed to support mathematics and science tutoring, is a very intelligent tutoring system.
2. Smart Tutee, research in this category is rare because most AI-based education systems typically focus on providing support to students rather than giving them opportunities to act as tutors or advisors. However, involving students in situations where they help others, such as AI students, to understand complex concepts, can be a very effective approach in improving their higher-order thinking skills and knowledge.

3. Smart learning tools or partners, these devices have the potential to assist students in data collection and analysis in an effective and efficient manner. This allows them to focus on important aspects such as higher-level thinking such as inference and prediction rather than getting bogged down in low-level tasks such as editing and calculations.
4. Advising policy makers, in using artificial intelligence (AI) technology, policy makers can gain deeper insight into trends and issues in the world of education, both in large-scale and small-scale contexts. This allows them to more effectively design and assess the effectiveness of educational policies.

From the several roles of AI above, it can be concluded that advances in the field of artificial intelligence (AI) have brought education into a new era. By combining human and computer intelligence, AI systems can become intelligent teachers, tools, or friends in education. This helps in decision making in the world of education. Combining AI and education opens up new opportunities to improve teaching and learning. Teachers can use intelligent systems to assist in assessment, collect data, improve learning progress, and create new strategies. Students can also feel the benefits of smart tutors and more flexible learning to improve learning outcomes. Moreover, the integration of AI and education not only changes education itself, but also influences the way we understand human knowledge, thought and culture. Therefore, the use of AI in education has become a major research focus in the field of computers and education. AI aims to be a liaison between educators, students, computer scientists, and practitioners to advance state-of-the-art technologies in this growing field (Hwang et al., 2020).

Apart from that, Lijia Chen's research (Chen et al., 2020) also illustrates the results that AI has seen significant adoption and is widely used in educational contexts, especially by educational institutions, in various forms. AI was initially present in the form of computers and related computing technology, then developed into web-

based and online intelligent education systems, and finally experienced development with the use of integrated computer systems, along with other technologies.

In other sources, several roles of Artificial Intelligence in education will determine educational experiences in the future (Tjahyanti et al., 2022) :

1. Artificial intelligence is able to automatically carry out basic tasks in the educational process, including the assessment process. Although it does not completely replace human judgment, this role is almost close to reality.
2. Educational software can be tailored to students' needs. From kindergarten to graduate school, AI's impact on education is through the application of a more significant level of individualized learning. This can be through adaptive learning programs, games and software. This system responds to student needs, places greater emphasis on certain topics, repeats things students have not yet mastered, and generally helps students to work at their own pace, whatever that may be.
3. AI-based programs can provide useful feedback for students and teachers. Artificial intelligence is not only able to support teachers and students in developing a curriculum that suits their needs, but also provides an evaluation of the overall success of the curriculum. Some educational institutions, especially those providing online programs, utilize AI systems to monitor student progress and alert teachers if there are potential problems in student performance.
4. AI-powered data can change the way schools find, teach, and support students. Intelligent data collection, supported by intelligent computer systems, has changed the way universities interact with prospective and current students. From the recruitment process to helping students choose the most appropriate courses, intelligent computer systems help increase personalization in every aspect of the

college experience to better suit students' needs and goals.

### **Utilization of Artificial Intelligence as a Learning Style**

The use of *Artificial Intelligence* (AI) is something commonplace in the digital era. *Artificial Intelligence* (AI) is a technology that imitates human abilities to think, understand, learn, and carry out actions that sometimes require human intelligence such as speaking, language processing, and analyzing images or sounds (Mujiono, 2023). *Artificial Intelligence* (AI) makes it easy for someone to complete tasks efficiently using the help of technology (Sirinti Pongtambing et al., 2023). The use of *Artificial Intelligence* (AI) has also penetrated the world of education, and is predicted to make it easier to achieve educational goals (David, 2021b). This shows that the use of *Artificial Intelligence* (AI) cannot be separated from the world of education.

*Artificial Intelligence* (AI) applications that can be used in the world of education are *Computer Assisted Education* (CAE), *U-Dictionary*, *Digital Reporting Education* (DRP) (Zahara et al., 2023), *Chatbots*, *AI Tutor Systems*, and plagiarism detection tools (Afrita, 2023). The results of interviews with Masters of Islamic Religious Education (PAI) students include explanations regarding the use of *Artificial Intelligence* (AI) applications in the world of lectures. Some of these applications are ChatGPT, QuillBot, Canva Magic Write, and Turnitin (FA, *personal communication*, 2023). Another interview result related to the *Artificial Intelligence* (AI) application used is Grammarly (NS, *personal communication*, 2023). Based on the results of the interview, the applications that are often used are ChatGPT, Grammarly, Canva Magic Write, Turnitin, and QuillBot.

Referring to interview results regarding the use of *Artificial Intelligence* (AI) in the form of ChatGPT, QuillBot, Canva Magic Writer, Turnitin, and Grammarly. This application is very familiar in the world of lectures. The use of Grammarly has contributed to language translation from Indonesian to English (Marliyanda et al., 2022). The next application is QuillBot. QuillBot has the benefit of organizing language or paraphrasing

sentences (Fitria, 2021b). Apart from QuillBot, ChatGPT can be used to organize the structure of a sentence, and can create summaries of long texts (Zen Munawar et al., 2023). If QuillBot, Grammarly, and ChatGPT can be used to organize sentences correctly, then Turnitin has a different role from these three applications. Turnitin detects plagiarism from a written work (Indonesian Islamic University & Risparyanto, 2020).

Referring to the results of interviews from Master of Islamic Religious Education (PAI) students regarding the ChatGPT, QuillBot, Grammarly and Turnitin applications which actually have benefits for students. These benefits are helping students complete lecture assignments on time (MHY, *personal communication*, 2023), to search for literature related to Islamic Religious Education (PAI) (N, *personal communication*, 2023), and used as a tool to help students in their work. Scientific work is mainly concerned with checking plagiarism, as well as arranging sentences neatly (NH, *personal communication*, 2023). Based on this interview, it can be concluded that the use of *Artificial Intelligence* (AI) is the learning style of Master of Islamic Religious Education (PAI) students. They use *Artificial Intelligence* (AI) to assist in completing lecture assignments.

The use of *Artificial Intelligence* (AI) in the world of education, especially for Masters of Islamic Religious Education (PAI) students, has advantages and disadvantages. These advantages are that it is easy for someone to get the information they want, saves time, and is able to analyze data continuously (ISH, *personal communication*, 2023). This is in line with the opinion of Endang Irawan Supriyadi and Dianing Banyu Asih that *Artificial Intelligence* (AI) can complete work in a short time (Supriyadi & Asih, 2021). Another opinion regarding the advantages of *Artificial Intelligence* (AI) is that it provides various learning literature (Limna et al., 2022).

Every technology definitely has advantages and disadvantages. According to an interview with the Master of Islamic Religious Education (PAI), *Artificial Intelligence* (AI) has disadvantages in the form of reducing student literacy, reducing critical thinking, and making students less productive (ARY, *personal communication*, 2023). This is in line

with Bambang Karyadi's opinion that *Artificial Intelligence* (AI) is only technology that helps humans, and humans should not be completely dependent on *Artificial Intelligence* (AI) (Karyadi, 2023a) . Based on this, the use of *Artificial Intelligence* (AI) cannot actually be separated from the negative side, and students need to use *Artificial Intelligence* (AI) wisely .

**Student Overview of Using Artificial Intelligence**

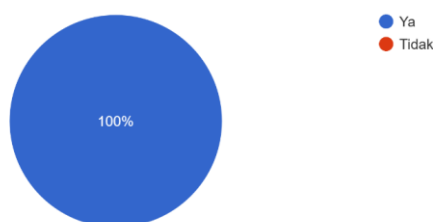
Research data was collected by researchers through questionnaires. The questionnaire was made in online form, namely with the Google Form application. Making the questionnaire aims to make it easier for researchers to measure or find out the extent of AI's role as a student's learning style. The questionnaire was filled out online by second semester students from classes A, B, C and D with 15 students as respondents. Respondent descriptions can be seen in the following table:

Table 1. Description of Respondents

No.	Class	Respondent	Percentage
1.	Class A	2 students	13.3%
2.	Class B	6 students	40%
3.	Class C	7 students	46.7%
4.	Class D	0 students	0%
Number of Respondents		15 students	100%

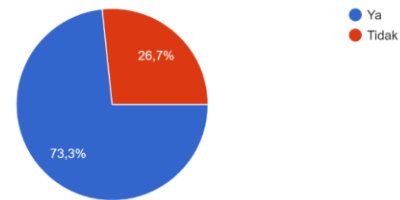
From table 1 it can be explained that of the 15 respondents there were 2 students from class A with a percentage of 13.3%, 6 students from class B with a percentage of 40%, 7 students from class C with a percentage of 46.7% and 0 respondents from class D. From the questionnaire data provided filled out the Google form that all respondents agreed that the use of AI makes the lecture process easier. For more details, see the following diagram

Penggunaan AI membuat anda lebih mudah dalam proses perkuliahan  
15 jawaban



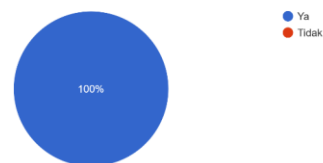
Various perceptions from responses regarding use in doing college assignments. This can be seen from the following diagram:

Penggunaan AI membuat anda lebih nyaman dalam mengerjakan tugas kuliah  
15 jawaban



Based on the diagram above, it can be seen that 11 respondents with a percentage of 73.3% agreed that AI makes respondents more comfortable in studying. The remaining 4 respondents with a percentage of 26.7% did not agree with this. As for the various perceptions of respondents from the indicators that researchers provide regarding how important AI plays a role in lectures, it can be seen that AI gives a positive response because it can help students in lectures. AI technology has the potential to facilitate students and also contribute to increasing efficiency and effectiveness in lectures. This can be seen from the following diagram:

Penggunaan AI sangat efektif dan efisien sebagai alternatif dalam membantu perkuliahan di Era Digital  
15 jawaban



From the 15 respondents who filled out the Google form, it was also seen that the respondents agreed that using AI in lectures in the digital era is an effective and efficient alternative. The use of AI in student learning has shown significant potential in improving learning effectiveness and experience. Joupy G. Z Mambu et al (Mambu et al., 2023) in their article show that AI helps in optimizing time and effort as well as increasing learning efficiency and providing learning experiences to students. AI systems can provide recommendations and learning materials tailored to their needs. The use of AI creates a more personalized learning experience and helps students achieve optimal results. This is in

line with Karyadi's opinion (Karyadi, 2023b) in his article that AI can function as a personal virtual tutor that provides individual guidance based on students' needs and weaknesses. Apart from that, AI can also increase student interaction and involvement in learning. For example, in Chat GPT AI can be used as a responsive virtual assistant to answer student questions and solve problems in real time. This allows AI to act as a learning chatbot which was developed to provide assistance and answers to questions related to material, assignments or certain topics and the chatbot will provide responses in the form of appropriate answers and explanations. This allows students to study independently. Based on the explanation above, the use of AI in student learning allows for better personalization and adaptation. Through data analysis, AI can identify the learning preferences and needs of each student individually. With a deeper understanding of each student's learning style and level of understanding.

### Conclusions

The use of *Artificial Intelligence* (AI) is something commonplace in the digital era. *Artificial Intelligence* (AI) is a technology that imitates human abilities to think, understand, learn, and perform actions that sometimes require human intelligence such as speaking, language processing, and analyzing images or sounds. *Artificial Intelligence* (AI) makes it easy for someone to complete tasks efficiently using the help of technology. The use of *Artificial Intelligence* (AI) has also penetrated the world of education, and is predicted to make it easier to achieve educational goals. This shows that the use of *Artificial Intelligence* (AI) cannot be separated from the world of education. In the world of education, especially for Masters of Islamic Religious Education (PAI) students, the use of *Artificial Intelligence* (AI) has advantages and disadvantages. These advantages are that it is easy for someone to get the information they want, saves time, and is able to analyze data continuously. Of the 15 respondents who filled out the Google form, 11 respondents with a percentage of 73.3% agreed that AI made the respondents

more comfortable in doing their studies. . The remaining 4 respondents with a percentage of 26.7% did not agree with this. As for the various perceptions of respondents from the indicators that researchers provide regarding how important AI plays a role in lectures, it can be seen that AI gives a positive response because it can help students in lectures.

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