

# The use of artificial intelligence (AI) in student learning process in the digital era

Faujiah <sup>1,\*</sup>, IGAA Noviekayati <sup>1</sup>, and Niken Titi Pratitis <sup>1</sup>

<sup>1</sup> University 17 August 1945, Surabaya, Indonesia

\*Email addresses of the corresponding author: faujiah@untag-sby.ac.id

## Abstract

*Purpose:* Artificial intelligence (AI) has become one of the most influential technologies in the digital era, and its potential to revolutionize the learning process is enormous. This article discusses the role of AI in improving the quality of education in the digital era. This research aims to provide an understanding of the role of AI in the learning process in the digital era.

*Method:* The research method used is a literature review, which includes an analysis of various sources and views related to the use of AI in higher education. The data used in this article is information from various literary sources, including research results, scientific articles, and news related to the implementation of AI in education. Examples of the role of AI include several main aspects, including personalization, interactivity, feedback, accessibility, and efficiency.

*Result:* The results of the data analysis show that AI has great potential to improve the quality of education in the digital era. AI can also help improve students' understanding and critical thinking skills through AI-assisted media. The use of AI must also be balanced with the teacher's ability to prevent the negative impacts of using AI.

*Conclusion:* By applying AI to the learning process, we can create a more personalized, interactive, and effective learning experience for all students.

**Keywords:** artificial intelligence, digital era learning process, higher education

## INTRODUCTION

Education is one field that continues to develop rapidly along with advances in digital technology. The digital era has changed the way we learn and teach, and introduced new challenges for teachers. In the midst of the changes that are occurring, the use of Artificial Intelligence (AI) technology has become a topic that is attracting increasing attention in the context of education. In the digital era, teachers are faced with various challenges that affect their roles and their duties (Kamila et al, 2022). One of the main challenges is managing the abundance of information. With easy access to digital resources and online learning content, teachers must be able to filter, evaluate, and use information effectively to support students' learning processes.

Additionally, each student has different needs and learning styles. Teachers must be able to overcome this challenge by providing learning that suits students' individual needs (Sari, 2021). This process of personalizing learning requires significant effort, including a deep understanding of student needs and the ability to deliver learning material individually (Sari & Ningsih, 2022). The chosen strategy must also be of great concern to teachers to be implemented in the classroom in order to facilitate good learning and teaching processes (Fauziningrum et al, 2023). Another challenge is providing effective feedback to students. Good

feedback is very important in improving students' understanding and helping them improve weaknesses in their learning. However, in a busy classroom environment, providing timely and detailed feedback to each student becomes a challenge.

In facing these challenges, Artificial Intelligence (AI) technology offers attractive potential (Rusmiyanto et al, 2023). As we mentioned above, AI attractiveness tests use advanced algorithms to analyze and score a person's attractiveness. While AI can not understand beauty and attractiveness, the scores are based on facial features, symmetry, and other quantifiable aspects. Also, AI can help teachers manage data and information quickly and efficiently. Through advanced algorithms, AI can analyze and interpret student data to provide deep insight into individual student needs and progress.

Apart from that, AI technology can also support personalized learning by using machine learning algorithms. By leveraging student data and individual preferences, AI can provide learning experiences tailored to each student's needs. This can increase student engagement in learning and help them reach their full potential. Although the use of AI technology promises many benefits in facing teachers' teaching challenges in the digital era, there are still several challenges that need to be overcome. One of them is concern about the privacy and security of student data. The protection of students' personal data becomes very important in the use of AI technology in educational contexts.

## **METHOD**

The research approach applied in this study is a qualitative approach using the literature study method. The data collection method used is documentation techniques, where data is collected from various literature sources that are relevant to the research theme. Data analysis was carried out descriptively with the aim of finding information that was relevant and related to the research theme. The research steps carried out include selecting a research topic, collecting data from library sources, analyzing data, preparing a research report, and presenting research results.

Data analysis is the process of arranging the sequence of data, organizing it into patterns, categories and basic sequential units. The data analysis technique used in this research is a descriptive method, namely research that seeks to describe and interpret what exists, emerging opinions, ongoing processes, consequences or effects that occur or developing trends. Apart from that, the author also uses a comparative method, namely the researcher tries to determine the causes or reasons for differences or compare one opinion with another opinion. The purpose is to identify differences or similarities, leading to a better understanding of the underlying causes or relationship.

The research instruments used are various bibliographic sources, such as books, journals, articles, bibliography, and so on. Data validity is guaranteed through selecting literature sources that are relevant to the research theme, and data selection and verification has been carried out to ensure accuracy and validity. The validity of this research is supported by reliable references and referrals, which come from educational and academic sources.

By applying the research methods above, it is hoped that this research report can produce accurate information and can be used as a reference in the context of utilizing Artificial Intelligence (AI) technology in facing the challenges of teaching teachers in the digital era.

## **RESULTS AND DISCUSSION**

The development of science and information technology is experiencing rapid growth, providing a positive impact on humanity. One of the technological developments that continues to develop today is the internet. This directly affects the basic need for information in human life today because information is very easy to obtain in various aspects of human life. Developments in the fields of science and information technology are always accompanied by impacts, both direct and indirect. With advances in information technology, society has wider space for movement. Human activities that were originally national in nature have changed to become international, events that occur in one country in a matter of seconds can be known by residents of other parts of the world.

The need for competitive advantage in various strategic sectors has historically been a driving force for the development of new, more sophisticated and intelligent and cost-effective mechanisms in production processes and service provision. In this case, and since the beginning of the industrialization era, from time to time, leaps in technological trends occur and revolutionize the concept of production and service provision, this is what is called the industrial revolution. The first industrial revolution occurred in the field of mechanization and steam engines, the second industrial revolution was based on the intensive use of electrical energy and mass production, and the third industrial revolution was founded in the IT environment and the expansion of the digitization domain (Mulianingsih, et al, 2020).

According to the Ministry of Education and Culture (2022), the aims of creating artificial intelligence include, First, it is estimated that AI will be used to create software or robots that can help humans in their daily routines. Second, it is estimated that the presence of AI will make machines smarter than before. Also, it is hoped that it can really help humans in solving complex problems, such as through the development of smart calculators that calculate quickly.

### **Application of AI in the field of Education**

There are several applications of AI that can be used in the education sector, including: (Putu, et al, 2022).

#### *Virtual Mentor*

AI can provide feedback from students' learning activities and practice questions, then provide recommendations for material that needs to be studied again like a teacher or tutor. One example of its application is Blackboard, which is a tool that is widely used in universities in Europe and America. This AI tool is widely used by professors/lecturers to publish notes, homework, quizzes and tests which allow students to ask questions and assignments for the assessment process. This tool can identify the reasons behind students' lack of understanding and can offer solutions that have been released by the lecturer and programmed in advance. This AI system will continue to learn and update information independently according to the needs and obstacles faced by students.

#### *Voice Assistant*

Voice assistants are also one of the most widely known AI technologies and are used in various fields, including education. Examples of commonly known voice assistants include Google Assistant (Google), Siri (Apple), Cortana (Microsoft), and others. Voice Assistant allows students to search for material, reference questions, articles, and even books by just speaking or saying keywords.

#### *Smart Content*

It is an AI technology that functions to share and find digital material and book content that has been programmed virtually more easily and quickly. Common examples of the application of this technology are in various digital libraries today, both in schools, universities and public libraries. AI can find and categorize the books you are looking for quickly and in a structured manner. You will even be given book recommendations and other content that is relevant to what you are looking for.

#### *Presentation Translator*

This technology is similar to Voice Assistant, namely that it relies on voice to carry out its functions. It's just that the Presentation Translator has specifications for its use for explaining or presenting

### **Impact of Implementing Artificial Intelligence in the Education Sector**

The application of new technology and new programs naturally has positive and negative impacts on human life. Likewise, the application of artificial intelligence in the world of education certainly has an impact on people's lives (Zahara, 2023).

The positive impacts of implementing artificial intelligence in the education sector make the tasks of teachers and students easier in teaching and learning activities. Furthermore, Unlimited data storage and make the tasks of educators non-repetitive. It can be used at any time without time limit. So, work gets faster and better

In the other hand the negative impacts of implementing artificial intelligence in the education sector makes teachers and students lazier. Also, eliminate some of the work of educators, especially in the administrative field. Next, AI cannot understand the purpose and information created, because AI works according to what has been programmed.

### **Competencies Needed in the Digital Era**

The implementation of artificial intelligence (AI) in the education sector requires certain competencies to ensure the successful implementation and use of AI (Hidayat, et al, 2023). The following are several competencies that must be possessed in implementing AI in the education sector:

#### *Understanding of AI*

It is important to have a strong understanding of the basic concepts and principles of AI, including an understanding of machine learning, natural language processing, data analysis, and algorithms. These competencies help in understanding the capabilities, limitations and potential of AI in the context of vocational education.

#### *Vocational Education Domain Knowledge*

Having in-depth knowledge of the curriculum and vocational education requirements is important. This enables you to design and implement AI solutions that are relevant to student and industry needs.

#### *Data Analysis*

The ability to perform data analysis is a key competency in AI implementation. This involves the ability to collect, manage, and analyze vocational education data effectively. Understanding

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statistics, data analysis techniques, and the use of data analysis tools and platforms are also important.

#### *Technical Skills*

In implementing AI, technical skills such as programming, software development, understanding of algorithms, and the ability to work with AI platforms and data analysis tools are required. These skills enable you to develop, configure, and manage AI systems.

#### *Collaboration Ability*

Implementing AI in vocational education involves collaboration with various parties, including teachers, students, administrators, and AI experts. The ability to collaborate well and communicate effectively with different stakeholders is critical in ensuring successful adoption and implementation.

#### *Ethics and Privacy*

Understanding the ethical and privacy issues associated with AI implementation is critical. In collecting and managing student data, it is important to ensure compliance with privacy standards and implement appropriate security measures to protect sensitive data.

#### *Adaptability and Learning*

AI implementation continues to expand, and AI technology continues to evolve. Therefore, having the ability to adapt and the willingness to continue learning and following AI developments is very important. You need to keep up with the latest developments in the fields of AI and education to ensure optimal use.

#### *Project Management Skills*

In implementing AI, project management skills are required to plan, execute, and manage AI implementation projects efficiently. This includes the ability to plan, manage resources, schedule, monitor and control projects effectively.

## **CONCLUSION**

The implementation of AI in vocational education is expected to increase the efficiency, quality and relevance of vocational education to industrial needs in the Industrial Revolution 4.0 era. However, it is important to remember that the role of teachers and educators remains important in guiding students, implementing effective learning strategies, and providing added value that cannot be replaced by AI. Although AI has a positive impact in vocational education, it is important to balance this with the still important role of humans.

Teachers and educators have a crucial role in providing guidance, emotional support, development of social skills, and holistic assessment of students. Developing and strengthening these competencies will help in designing, implementing, and managing effective AI solutions in vocational education. It is important to continue to improve understanding and skills in the fields of AI and education to face the challenges and opportunities that arise as technology develops.

Thus, more attention is needed when using AI in learning. In the future, collaboration between AI developers and schools is necessary in an effort to improve quality learning in the era of technological development. Apart from that, research on the impact of using AI in education needs to be explored further so that undesirable things can be anticipated.

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