

THE NEW NAVIGATION OF EDUCATION: OPPORTUNITIES AND CHALLENGES FOR ARTIFICIAL INTELLIGENCE (AI) LECTURERS IN INDONESIA

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Abstract

Education in the digital era is undergoing many changes, including the important role of lecturers in the form of Artificial Intelligence (AI). Universitas Teknokrat Indonesia has taken an important step by presenting the first AI lecturer in Indonesia. The implementation of AI lecturers offers opportunities to improve the efficiency and quality of education while creating a more inclusive environment. However, ethical and legal challenges also arise, including the protection of personal data, the rights and obligations of lecturers and students, and education quality assurance. This research focuses on "The New Navigation of Education: Opportunities and Challenges for Artificial Intelligence (AI) Lecturers in Indonesia" in the context of Industrial Revolution 4.0 and Society 5.0, where digital technology, including AI, plays a key role. The research method used is normative research or library research. This research uses several approaches in its analysis: conceptual, analytical, historical, and futuristic approaches. This research has a descriptive and prescriptive nature. This research uses content analysis to interpret and understand the text and communication media collected. The result of this research is that it is important to develop specific regulations and codes of conduct, as well as provide AI ethics education and effective reporting mechanisms. Periodic evaluation and review should be conducted to ensure the relevance and effectiveness of the regulations and code of conduct. The implementation of AI lecturers in Indonesia has the potential to open new opportunities in educational transformation if managed wisely with an integrated, sustainable approach and involving various stakeholders. Thus, Indonesia has the potential to become a leader in the utilisation of AI in education by combining technological innovation with a commitment to the quality of education and the protection of all parties rights.

Keywords: Artificial Intelligence, Education in Indonesia, AI Lecturer, AI Opportunities in Education, AI Challenges in Education.

1 INTRODUCTION

The industrial revolution 4.0 and society 5.0 have given birth to various advanced technological developments that have changed how we live our daily lives.(Chandra & Fernando, 2022) One of the most significant developments is the emergence of Artificial Intelligence (AI). From the medical sector to the manufacturing sector, AI has become the most important and revolutionary tool.(Müller, 2014) One of the most affected sectors is education. AI offers a

great opportunity to change traditional approaches to education to be more innovative and effective. For example, through AI, teaching processes can become more efficient, enable personalized teaching based on individual learning needs and abilities, and expand access to quality education for those who previously could not afford it.

In the last decade, information and communication technology development has opened up new opportunities in various sectors, including education.(Triyanto, 2020) One of the most striking phenomena in this sector is the emergence of Artificial Intelligence (AI), or artificial intelligence, as a potential educational tool. In line with this global trend, Indonesia has also experienced a shift in educational practice, including the emergence of the AI lecturer phenomenon.(Rosa, 2023) AI Lecturer is a system or program built based on AI technology capable of performing some or all of the tasks and functions normally performed by human lecturers.(Imron Mawardi, 2023) They are built on learning models derived from the data and experiences of the best human lecturers to offer an efficient and effective teaching approach.

Various factors trigger this phenomenon. First, there is a growing need for education that is more personalized and responsive to students' individual needs. AI technology has the ability to customize teaching materials and methods based on each student's learning characteristics and preferences to provide a more personalized and effective learning experience. Second, there are demands to increase the efficiency and effectiveness of the teaching process. With AI, teaching, and grading can be automated and instantaneous, allowing human lecturers to focus on other aspects of teaching that require human interaction, such as mentoring and coaching students. However, the AI lecturer phenomenon also raises challenges and issues that must be addressed. For example, there are questions about how the role and status of human lecturers will change with the presence of AI lecturers. There are also questions about ensuring ethics and student data privacy are respected in using AI in education. In addition, there are challenges in ensuring that all students, regardless of their background and location, can have equal and fair access to these technologies. Thus, AI lecturers bring new opportunities and challenges to education. Technology and education meet in this new era, opening up opportunities for more innovative and effective teaching methods. However, it also requires careful thought and planning to ensure that these benefits are shared by all students fairly and ethically. There are also questions about how to ensure that ethics and student data privacy are respected in the use of AI in education. In addition, there are challenges in ensuring that all students, regardless of

their background and location, can have equal and fair access to these technologies. Thus, AI lecturers bring new opportunities and challenges to education. Technology and education meet in this new era, opening up opportunities for more innovative and effective teaching methods. However, it also requires careful thought and planning to ensure that these benefits are shared by all students fairly and ethically. There are also questions about ensuring ethics and student data privacy are respected in using AI in education. In addition, there are challenges in ensuring that all students, regardless of their background and location, can have equal and fair access to these technologies. Thus, AI lecturers bring new opportunities and challenges to education. Technology and education meet in this new era, opening up opportunities for more innovative and effective teaching methods. However, it also requires careful thought and planning to ensure that these benefits are shared by all students fairly and ethically. Regardless of their background and location, they can access these technologies equally and fairly. Thus, AI lecturers bring new opportunities and challenges to education. This is a new era where technology and education meet, opening up opportunities for more innovative and effective teaching methods, but it also requires careful thought and planning to ensure that these benefits are shared by all students fairly and ethically. Regardless of their background and location, they can access these technologies equally and fairly. Thus, AI lecturers bring new opportunities and challenges to education. Technology and education meet in this new era, opening up opportunities for more innovative and effective teaching methods. However, it also requires careful thought and planning to ensure that these benefits are shared by all students fairly and ethically.

The innovative step of the Indonesian Technocratic University (UTI) in presenting the first Artificial Intelligence (AI) lecturer in Indonesia signifies a new era in higher education in this country. This AI lecturer, Alpha, was built based on data and information regarding behavior and teaching methods from the best lecturers at the Indonesian Technocratic University (UTI), demonstrating the smart and innovative use of AI technology in improving the quality of teaching. (Coil Team, 2023) Alpha's creation process involved intensive data collection and analysis, demonstrating AI technology's complexity and sophistication. In this stage, the Indonesian Technocrat University (UTI) AI expert team plays an important role in ensuring that the developed AI model can imitate the behavior and teaching methods of the best lecturers. This move demonstrates not only technological advances but also the commitment

of the Indonesian Technocratic University (UTI) to preparing its students for a future that is increasingly dominated by technology.(Nabiila Azzahra, 2023) With Alpha, students have the opportunity to learn from "lecturers" who are designed based on the best teaching methods from the best lecturers, which provide a rich and adaptive learning experience.(Technocrats, 2023) However, this also raises new questions and challenges. How do AI lecturers influence social interaction and develop students' interpersonal skills? How will human lecturers and AI lecturers collaborate? How will other universities in Indonesia respond and adapt to this innovation? In addition, there are also questions about ethics and privacy. How will Alpha's student data collected and processed be used and protected? How can universities ensure that using AI in teaching does not result in discrimination or bias? The presence of AI lecturers like Alpha certainly shows the great opportunities for AI technology in education and the challenges that must be faced. However,

2 METHODOLOGY

Research is a fundamental activity in exploring the truth of science and, in many cases, is triggered by curiosity or doubt about a problem. The topic discussed in this study is "The New Navigation of Education: Opportunities and Challenges for Artificial Intelligence (AI) Lecturers in Indonesia" in the context of the industrial revolution 4.0 and society 5.0, which refers to a society connected and powered by digital technology, including AI. The research method used in this study is normative research or library research.(Peter Mahmud Marzuki, 2005) This involves collecting and analyzing primary, secondary, and tertiary legal materials.(Johni Ibrahim, 2007) Primary legal materials include regulations and laws directly related to the research subject. Secondary legal material includes legal interpretation and analysis; tertiary legal material includes reference sources such as indexes and bibliographies.(Soekanto & Mamudji, 2001)This study will use several approaches in its analysis. A conceptual approach will be used to understand definitions and concepts related to AI lecturers in the era of the industrial revolution 4.0 and society 5.0. An analytical approach will be used to understand and evaluate the collected data and information. A historical approach will be used to understand how the role of the lecturer and education has evolved, and a futuristic approach will be used to forecast how the role and challenges of the AI lecturer might change.(Ariawan, 2013) The descriptive nature of this research refers to efforts to provide a clear and accurate description of the phenomenon of AI lecturers in Indonesia. In

contrast, the prescriptive nature of this research refers to efforts to provide recommendations on how the challenges faced by AI lecturers can be overcome and how the opportunities offered by AI can be utilized. Maximally. Furthermore, the material that has been collected will be processed and analyzed using content analysis, a research technique used to interpret and understand the meaning of texts and communication media.(Kristiawanto, 2022) By applying these methods and approaches, this research seeks to provide an in-depth understanding of the opportunities and challenges faced by AI lecturers in Indonesia in the industrial revolution 4.0 and society 5.0 era.(Zico Junius Fernando et al, 2022)

3 FINDINGS AND DISCUSSION

3.1 The Role and Potential of AI Lecturers in the Era of the Industrial Revolution 4.0 and Society 5.0

In an increasingly technology-driven world, where artificial intelligence or AI is becoming key in many aspects of life, we are seeing AI-based technologies in various sectors of the economy and society, such as transportation, home and service robotics, healthcare, public safety and security, employment, workplace, entertainment including education.(Niemi, 2021) In the era of industrial revolution 4.0 and society 5.0, where digital technology and human resources interact harmoniously, the role and potential of AI lecturers receive special attention. The main role of the AI lecturer is to become a learning facilitator who can provide instructions tailored to each student's needs and learning speed. With advanced algorithms and access to a wealth of data, AI lecturers can personalize course material, adjust learning difficulty and pace, and provide useful real-time feedback to students. This means that students get teaching tailored to their needs and feedback that they can use to improve and deepen their understanding. The potential of AI lecturers does not stop at personalizing learning. AI lecturers also have the potential to democratize education. With AI, the quality of teaching no longer depends on the physical location of students or lecturers. Students in remote areas can have the same access to high-quality teaching as students in big cities. In addition, AI can help overcome the shortage of lecturers in certain fields because AI lecturers can teach various fields without being limited by time or place. In addition, AI lecturers can free human lecturers from the burden of routine tasks and give them more time to focus on those aspects of teaching that require human interaction and unique skills, such as mentoring students, cultivating critical thinking skills, and helping students develop social and emotional skills.

However, it is important to note that while AI lecturers have great potential, they are not a substitute for human lecturers but tools that can complement and enhance the teaching provided by human lecturers. In this case, the role of human lecturers in educating and fostering students remains irreplaceable. In the context of the industrial revolution 4.0 and society 5.0, the role and potential of AI lecturers cannot be ignored. They offer new ways to improve the quality and accessibility of education and can help prepare students for a world increasingly dominated by technology. (Mulianingsih et al., 2020) However, implementing AI lecturers must be done carefully, considering various challenges, including ethical, legal, and technical issues. If done correctly, AI lecturers can become invaluable tools in education, helping to form a new generation of students ready to face the challenges and opportunities in the industrial revolution 4.0 and society 5.0.

Although there are many positive potentials, implementing AI lecturers requires education to consider several important considerations. For example, because AI algorithms need large amounts of data to work effectively, education must find ways to collect and use student data that comply with data privacy laws and research ethics. In addition, there needs to be a clear understanding of how the algorithm works and makes decisions to ensure that the learning process remains transparent and accountable. AI's ability to personalize learning also has the potential to widen the digital divide between those who have access to these technologies and those who do not. To fully exploit the potential of AI lecturers, education needs to ensure that all students, regardless of their background or location, have equal and fair access to these technologies. Another challenge that must be overcome is integrating AI lecturers into the existing education system. This may require changes in technology infrastructure, training of lecturers in using new technologies, and changes in curricula and teaching methods. However, while there are many challenges, AI lecturers' potential to transform education is enormous. By leveraging their ability to personalize teaching and expand access to quality education, we can help prepare students for success in the industrial revolution 4.0 and society 5.0. Another challenge that must be overcome is integrating AI lecturers into the existing education system. This may require changes in technology infrastructure, training of lecturers in using new technologies, and changes in curricula and teaching methods. But while the challenges are many, the potential for AI lecturers to transform education is enormous. By leveraging their ability to personalize teaching and expand access to quality education, we can help prepare

students for success in the industrial revolution 4.0 and society 5.0. Another challenge that must be overcome is integrating AI lecturers into the existing education system. This may require changes in technology infrastructure, training of lecturers in using new technologies, and possibly changes in curricula and teaching methods. However, while there are many challenges, AI lecturers' potential to transform education is enormous. By leveraging their ability to personalize teaching and expand access to quality education, we can help prepare students for success in the industrial revolution 4.0 and society 5.0. the potential for AI lecturers to transform education is enormous. By leveraging their ability to personalize teaching and expand access to quality education, we can help prepare students for success in the industrial revolution 4.0 and society 5.0. the potential for AI lecturers to transform education is enormous. By leveraging their ability to personalize teaching and expand access to quality education, we can help prepare students for success in the industrial revolution 4.0 and society 5.0.(Zahara et al., 2023)

For this reason, education needs to invest in research and development of AI, as well as in training lecturers and students in using this technology. Additionally, there needs to be an ongoing dialogue between education, government, and industry about how best to integrate AI into education and ensure that this technology is used ethically and responsibly. Thus, in the industrial revolution 4.0 and society 5.0, the role and potential of AI lecturers is not only in enriching the teaching-learning process but also in shaping the direction and future of education itself. This is an exciting opportunity but also a challenge that requires careful thought and planning to ensure that all students share the benefits of AI in education.

Various educational institutions around the world have started experimenting with the use of AI in educational roles, including the use of AI lecturers or virtual assistants in teaching. Here are some examples:

a. Georgia Tech University

Here, an AI teaching assistant named "Jill Watson" has been used since 2016 in online courses.(Georgia Tech, 2020) Jill Watson, which is based on IBM's Watson AI technology, can answer student questions, remind students of deadlines, and even interact with students naturally. Jill Watson has become so effective that many students do not realize they interact with AI.

b. Deakin University, Australia

Here, a digital assistant named "Deakin Genie" has been used to help students answer questions about campus life and study.(Deakins, 2017) Deakin Genie can help students with various tasks, from looking for books in the library to arranging study schedules.

c. Indonesian Technocratic University

As mentioned in the background, the Indonesian Technocrat University has developed Indonesia's first AI lecturer, known as "Alpha."(Silviana, 2023)Alpha was built by collecting data and information about the behavior and teaching methods of the best university lecturers, then using that data to train an AI model.

These are just a few examples of how AI has started to be used in education. However, it is a fast-growing field, and many other institutions worldwide are also experimenting with this technology. From the statement above, we can learn several important things:

a. Application of AI in Education

AI has begun to be used in a variety of ways in education, from AI teaching assistants to AI lecturers. This use of AI assists in answering student questions, providing reminders about deadlines, and even interacting with students in a seemingly natural way.

b. Personalized Approach

AI has the potential to provide a more personalized approach to education. For example, AI can identify students' learning needs and adapt teaching based on those needs.

c. Importance of Data

The development of AI lecturers or AI teaching assistants requires large and relevant data sets. This data is used to train the AI and enable it to respond in a relevant and appropriate manner.

d. Educational Transformation

AI can help change how we teach and learn, for example, by reducing the administrative burden on lecturers and providing more personalized support to students.

e. Challenges and Opportunities

While the use of AI in education brings significant opportunities, some challenges need to be overcome. This includes issues such as data privacy, copyright, and liability.

f. The Importance of Legal and Ethical Frameworks

To ensure that the use of AI in education does not violate the law or harm students, there needs to be a strong legal and ethical framework in place.

By understanding these things, we can better prepare ourselves to take advantage of the opportunities offered by AI in education and address the challenges that may arise.

3.2 Ethical and Legal Challenges in the Implementation of AI Lecturers in Indonesia

Implementing AI lecturers in Indonesia presents ethical and legal challenges that require careful thought and handling. Data privacy and copyright issues are a major concern in the digital era. While AI has the potential to revolutionize education, its use also opens the door to potential data abuse and privacy breaches. (Zhang & Aslan, 2021) In terms of privacy, it is important to note that lecturer AI works by processing large amounts of data, including student data. This information can include academic details such as grades and study progress but can also include personal and demographic data. Collection and use of this data can pose serious privacy and data protection risks. For example, is the data collected and stored securely? How is the data used, and who has access to the data? These are questions that need to be addressed to ensure that student's privacy rights are protected. In addition, there are also legal challenges related to copyright. How, for example, do copyright regulations apply to material AI lecturers teach? Who owns the copyright to the material - is it a real human lecturer, a university, or a company that develops AI? Another challenge relates to accountability. If something goes wrong or loses, who is responsible? Ensuring a clear legal framework for determining liability in these situations is important.

Ethical issues also arise when it comes to algorithm bias. AI algorithms are trained on data; if that data is biased, then the algorithm is also likely to be biased. This can have a serious impact on student learning. For example, if an AI algorithm underestimates a student's ability based on certain demographic data, it can create an unfair and damaging learning experience for that student. Another question is how to ensure that lecturer AI is used ethically. While AI lecturers can help address teacher shortages and improve teaching quality, they can also be used to replace fully human lecturers, with the potential to reduce employment and raise other ethical questions. Given these ethical and legal challenges, Indonesia needs to establish a strong and transparent legal framework to regulate the use of AI in education. This should include regulations on data privacy, copyright, liability, and the ethical use of AI. Education must also

invest in training faculty and students on using AI safely and ethically and in research to understand and address algorithm bias. Additionally, dialogue between education, government, and industry is essential to ensure that AI enriches, not destroys, education. By ensuring that a strong legal and ethical framework is in place, Indonesia can harness the potential of AI in education while protecting students' rights and interests. This should include regulations on data privacy, copyright, liability, and the ethical use of AI. Education must also invest in training faculty and students on using AI safely and ethically and in research to understand and address algorithm bias. Additionally, dialogue between education, government, and industry is essential to ensure that AI enriches, not destroys, education. By ensuring that a strong legal and ethical framework is in place, Indonesia can harness the potential of AI in education while protecting students' rights and interests. This should include regulations on data privacy, copyright, liability, and the ethical use of AI. Education must also invest in training faculty and students on using AI safely and ethically and in research to understand and address algorithm bias.

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Although the challenges faced are quite large, they can still be overcome. Instead, it needs to be understood that this challenge is part of the evolution of education in modern society. The extent to which AI lecturers can positively impact will depend on how these challenges are faced and resolved. At this point, the role of government is very important. The government should develop regulations governing the use of AI in education, including data privacy,

copyright, and accountability issues. A strong and comprehensive regulatory framework will ensure that these technologies are used in a way that respects and protects the rights and interests of students. In addition, regulations also need to anticipate future developments in AI technology and provide room for further innovation and development. Education also plays an important role in addressing this challenge. Educational institutions must introduce training that prepares faculty and students to work with AI lecturers. This involves understanding how these technologies work, how to use them effectively in teaching-learning processes, and how to avoid and deal with potential ethical and legal issues. In addition, educational institutions must also invest in infrastructure that supports the use of AI. This includes the necessary hardware and software and adequate cybersecurity protection. This involves understanding how these technologies work, how to use them effectively in teaching-learning processes, and how to avoid and deal with potential ethical and legal issues. In addition, educational institutions must also invest in infrastructure that supports the use of AI. This includes the necessary hardware and software and adequate cybersecurity protection. This involves understanding how these technologies work, how to use them effectively in teaching-learning processes, and how to avoid and deal with potential ethical and legal issues. In addition, educational institutions must also invest in infrastructure that supports the use of AI. This includes the necessary hardware and software and adequate cybersecurity protection.

Finally, collaboration between educational institutions, government, and industry is essential. These parties must work together to ensure that AI is used most effectively and ethically. This collaboration could also assist in further research and development on how AI can be used in education and how to solve the existing challenges. Ultimately, using AI lecturers in Indonesia offers many opportunities but challenges. With the right approach, these challenges can be overcome, and the full potential of AI in education can be realized. In this way, Indonesia can become a leader in education in the digital age and help prepare young people for an increasingly digital future.

Indonesia does not yet have a specific legal and ethical framework for using AI in education. However, several applicable regulations and laws may be relevant, such as Law Number 19 of 2016 Amendments to Law Number 11 of 2008 concerning Information and Electronic Transactions (UU ITE) and Law of the Republic of Indonesia Number 27 2022 Concerning Personal Data Protection. The ITE Law protects consumers from misuse of personal

information online and has provisions related to electronic transactions. This is important because most AI applications in education operate in an online environment and collect and process users' personal data. It is hoped that the Personal Data Protection Act will further protect individuals from misuse of personal data by other entities, including in education. Some universities and educational institutions may have their own ethical guidelines governing the use of technology in education. However, there is no national ethical standard for using AI in education. In response to the rapid development of AI technology, Indonesia needs to consider developing a more specific legal and ethical framework. It is important to ensure that AI technologies are used safely and ethically in education, protect the rights of students and faculty, and support innovation and progress in this field. It should be remembered that this situation can change rapidly, and it is important to keep abreast of developments in laws and regulations regarding AI in education in Indonesia. I recommend contacting a legal expert or the relevant regulatory authority for the latest and most accurate information.

Here are some things that need to be done in dealing with ethical and legal issues related to AI lecturers:

a. Drafting Special Regulations

The government and other stakeholders must formulate and ratify special regulations governing the application of AI in education, including in the capacity of AI lecturers. This regulation must protect personal data, the rights and obligations of lecturers and students, and the quality of education.

b. Creating a Code of Ethics

Educational institutions and professional organizations must formulate a specific code of ethics for using AI in education. This code of conduct will guide lecturers and others on AI's ethical and unethical use in an educational context.

c. AI Ethics Education

Lecturers, students, and everyone involved in the education system need to understand the ethics of AI. This includes understanding how AI should and should not be used and how to prevent and deal with ethical and legal violations.

d. Reporting and Enforcement Mechanisms

There needs to be a clear and effective mechanism for reporting and dealing with legal and ethical violations related to the use of AI in education. This can include anonymous reporting systems, investigative procedures, and appropriate sanctions.

e. Periodic Evaluation and Review

As technology and situations evolve rapidly, regulations, codes of conduct, reporting, and enforcement mechanisms must be periodically evaluated and updated. This will ensure that they remain relevant and effective.

By paying attention to these aspects, we can create an environment where AI can be used effectively in education while ensuring that all rights and interests are protected.

3.3 Exploring Solutions: Strategies for Using AI in Education for the Future

In order to understand how important it is to utilize Artificial Intelligence (AI) technology in the Indonesian education system, we need to look ahead and consider what can be done to reach the full potential of this technology. One way is to explore various strategies and solutions that can help us utilize AI in education to prepare for a brighter future for Indonesia. (Luh Putu Ary Sri Tjahyanti et al, 2022) Of course, like every new technology, the use of AI in education has its challenges. To overcome these barriers, there needs to be an in-depth understanding of technology, the skills needed to use it effectively, and a clear legal and ethical framework to control its use. However, if we can tackle this challenge successfully, the potential for AI to revolutionize education is tremendous. From providing personalized learning support for each student to helping lecturers manage their workload, artificial intelligence can significantly impact how we teach and learn. In order to truly harness the potential of AI in education and navigate the existing challenges, Indonesia needs to develop and implement a robust and innovative strategy.

- a. First, investment in AI research and development must be a priority. Indonesia needs to build its capacity in AI research by increasing investment in basic and applied research and building partnerships with universities and industry to drive innovation. This research will help identify new ways to use AI in education and solve existing challenges.
- b. Second, training and capacity building for lecturers and students is very important. Lecturers need to be trained in using AI in their teaching, while students need a basic

understanding of AI to use it effectively in their learning process. Specialized training programs and courses can be very effective tools in realizing this goal.

- c. Third, developing a strong legal and ethical framework for using AI in education is essential. Regulations must be created and enforced to protect student data privacy and copyrights and to maintain accountability. However, these regulations must also be flexible enough to enable innovation and the effective use of AI.
- d. Fourth, Indonesia must use inter-sectoral partnerships and collaboration to leverage AI in education. Universities, government, and industry all have an important role to play in this. They should work together to create an environment that supports the research, development, and implementation of AI in education.
- e. Fifth, there needs to be significant investment in educational technology infrastructure. Universities and schools must have the hardware and software to support AI-based teaching. In addition, they also need to have policies and procedures in place to protect student data security and privacy.

A strong vision and commitment from the government and other education stakeholders must support these steps.(Nuryanto, 2021) They need to see the value and potential of AI in education and commit to achieving this goal. With this strategic approach, Indonesia can take advantage of the opportunities offered by AI in education and overcome the existing challenges. AI has the potential to make a big difference in the way we teach and learn. With the right investment, training, and regulation, Indonesia can ensure that these changes benefit all students and educators alike. Furthermore, this will help prepare Indonesia's young generation for an increasingly digital and global future.

4 CONCLUSION

Implementing AI lecturers in education in Indonesia opens up new opportunities to improve education quality and technology use. This provides exciting prospects in supporting more efficient and innovative teaching and learning processes, as well as creating education that is more inclusive and accessible to more people. However, using AI in education also raises new challenges and problems, especially in legal and ethical aspects. It is important to ensure that the use of AI is carried out safely, ethically, and legally and does not prejudice the rights of lecturers, students, and other parties. This requires a clear and robust legal and ethical framework, AI-related education and training, investment in technology and infrastructure,

ongoing research and development, and collaboration and partnership between various stakeholders. With an integrated and sustainable approach, Indonesia has the potential to become a leader in the use of AI in education, combining technological innovation with a commitment to quality education and protecting the rights of all.

In the future, digital transformation in education, including AI, will continue to grow. Therefore, the role of AI lecturers will become increasingly important. AI lecturers can be used to increase access to education, provide personalized teaching, and free up time for human lecturers to focus on tasks that require more intensive human interaction, such as providing emotional support and guiding students in their learning. However, these changes also require continuous adaptation and learning. Human lecturers must learn to work with AI and use this technology to support their teaching. Likewise, students must learn to study with AI lecturers and utilize this technology to support their learning. Another challenge is maintaining the quality of education and ensuring that AI is used in a way that supports, not replaces, the human interaction that is important in education. This requires ongoing research and development and monitoring and evaluating the use of AI in education. Finally, there needs to be an ongoing dialogue about how to use AI in education ethically and responsibly. It includes discussions on how to protect privacy and personal data, ensure that AI does not harm or discriminate against certain students, and ensure that all students have equal access to this technology. By considering all these aspects, we can create an education system that exploits the full potential of AI.

5 SUGGESTIONS

To implement AI in education in Indonesia, there are several suggestions that can be considered:

- a. The government and relevant institutions should establish a clear and strong legal and ethical framework for the use of AI in education. This framework should ensure that the use of AI is done safely, ethically, and legally and does not harm the rights of lecturers, students, or other parties.
- b. AI-related education and training should be an integral part of the education and training of teachers and lecturers. In addition, students should also be provided with an

understanding of how to learn with AI lecturers and utilise these technologies to support their learning.

- c. Governments and educational institutions should make sufficient investments in technology and infrastructure to support the use of AI in education.
- d. Continuous research and development should be conducted to ensure that AI is used in a way that supports, rather than replaces, the human interaction that is essential in education.
- e. There should be collaboration and partnership between various stakeholders, including governments, educational institutions, technology industries, and communities, to support the implementation of AI in education.
- f. There needs to be an ongoing dialogue on how to use AI in education in an ethical and responsible manner. This includes discussions on how to protect privacy and personal data, ensure that AI does not harm or discriminate against certain students, and ensure that all students have equal access to these technologies.

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