Cirebon Annual Multidisciplinary International Conference (CAMIC 2024)

Regulation and Ethics of Using Artificial Intelligence (AI) in Education

1st Dharliana Hardjowikarto
Faculty of Law
Swadaya Gunung Jati University
Cirebon, Indonesia
dharlianaayu@gmail.com

2nd Raden Handiriono
Faculty of Law
Swadaya Gunung Jati University
Cirebon, Indonesia
raden.handiriono@ugj.ac.id

3rd Insan Kamil
Faculty of Law
Swadaya Gunung Jati University
Cirebon, Indonesia
insankamil@ugj.ac.id

4 Reza Pramadya
Faculty of Law
Swadaya Gunung Jati University
Cirebon, Indonesia
rezapramudya@ugj.ac.id

***Abstract*— The development of digital technology today has brought significant changes in various sectors of life, including in the world of education. One of the technological innovations that is currently developing rapidly is the use of Artificial Intelligence. The use of Artificial Intelligence in education offers many potentials, such as personalized learning, automatic assessment, and increased administrative efficiency. However, behind these benefits, the use of Artificial Intelligence in education also faces problems that need to be addressed to ensure that its implementation is fair and transparent. This article aims to examine the legal regulations and ethics in the use of Artificial Intelligence in education. This study uses a normative legal approach method, namely focusing on the analysis of existing laws and regulations, as well as relevant legal theories. The results of the study show that although there have been several regulations covering the use of technology and personal data, specific and binding regulations regarding the use of Artificial Intelligence in education still do not exist. This creates legal uncertainty if someone experiences a loss in its use. Ethics in the use of AI in education must meet the principles of governance and management, transparency and accountability, sustainability and proportionality, privacy, security and safety, inclusiveness, and human-centered AIED. Some of the obstacles faced include technological gaps, supervision of the use of Artificial Intelligence, misuse of technology, and unprepared human resources. Therefore, it is necessary to develop specific regulations to regulate the use of Artificial Intelligence in education in order to maximize its benefits while protecting the legal rights of individuals, especially students, in the learning process.**

Keywords— ***Artificial Intelligence; Education; Ethics***

I. INTRODUCTION

The development of digital technology today has brought significant changes in various sectors of life, including in the world of education. One of the technological innovations that is currently developing rapidly is the use of Artificial Intelligence [1]. Artificial Intelligence or AI offers great potential in improving the quality of education, starting from the use of Artificial Intelligence-based learning systems, teaching aids, learning effectiveness, providing individual support for students, and helping teachers in providing more personalized learning [2]. AI's ability to produce creative content such as text, images, sound and video can also increase learning efficiency and open up opportunities for innovation in the implementation of learning [3].

However, although this technology can do many things automatically and help humans in their lives, and make human work easier and faster. The use of AI in education (AIED) also faces various legal and ethical issues in its use, such as access gaps, data bias, potential plagiarism, and unclear ownership of works. Humans should still have a very important role in controlling and directing the development of this technology. Humans are the ones who control the use of AI to help their work and life. The development of AI is not to replace the role of humans, but to help humans solve complex problems and improve the quality of life [3].

Therefore, students must be taught to be critical in the use of AI technology [4]. They need to understand privacy issues, ethics in data collection and how to analyze information provided by AI systems, and what ethical principles should guide the ethical and trustworthy application of AI in education [5]. In addition, students need to be informed about how to use AI technology wisely, this includes avoiding misuse of technology such as the spread of false information [6].

Along with the increasingly widespread application of Artificial Intelligence, which is reflected in the rapid increase in the number of ChatGPT users (one of the AI applications) which has reached 100 million active users in just two months. The need for regulations that govern its use and ensure data security and privacy is very important [7]. Legal regulations related to Artificial Intelligence in Education (AIED) not only cover how this technology is integrated into the education system, but also how to ensure that its use does not cause negative impacts. This includes protection of

personal data, fairness in the distribution of access to education, and compliance with ethical standards in the use of technology that has a direct impact on the learning process. Therefore, this study will discuss how the law in Indonesia regulates the use of Artificial Intelligence in education, as well as identifying the obstacles that arise in the implementation of this technology.

In addition, in terms of ethics, the use of Artificial Intelligence (AI) in education raises a number of issues that need serious attention. For example, how to ensure that AI does not only replace the role of educators, but can also improve the quality of education fairly and equally for all students. The use of Artificial Intelligence (AI) that is not properly regulated can give rise to problems of injustice, discrimination, or even violations of individual rights, such as the right to privacy and security of personal data. On the other hand, the unethical use of Artificial Intelligence (AI) can worsen educational inequality, create bias in algorithms, and damage the relationship between educators and students that should be built on human values.

Previous studies have shown that the implementation of AI technology in education makes it easier for educators in various matters, especially in administrative matters such as determining final grades based on weighting and assessment, creating more active learning, and facilitating the tasks of teachers and students in teaching and learning activities[8]. Meanwhile, Setiawi et al., found that AI in high school learning if used properly and correctly will have a positive impact and avoid negative impacts[9]. Furthermore, other studies emphasize that the impact of using Artificial Intelligence (AI) in educational learning consists of positive and negative impacts. The positive impacts are AI as a learning personalization tool based on individual needs, AI is used as an automatic assessment tool for teachers in learning activities, AI as a virtual tutor who is ready to help students understand concepts, answer student questions, and provide guidance in carrying out religious practices. AI as smart content functions to share and find digital material and book content that has been programmed virtually more easily and quickly. AI as a voice assistant allows students to search for materials, question references, articles, and books by simply speaking or mentioning keywords, while the negative impact is that it causes students to become dependent on AI technology, resulting in laziness in learning or laziness in thinking, as well as the risk of plagiarism in making student assignments[10]. Then research from Peliza revealed the need for clear policies to protect the privacy and security of student data. In addition, the availability of technological infrastructure, lecturer training in the use of AI, and the cost of implementing and maintaining AI systems are also important factors that need to be considered [11]. Of the existing research, qualitative research that examines legal regulations and ethics related to the use of AI in education and the obstacles to its use has not been widely carried out.

This study aims to examine in more depth the existing regulations and ethics related to the use of Artificial Intelligence (AI) in education and the obstacles to its use. With a deeper understanding, it is hoped that the right solution can be found to create a balance between the optimal use of Artificial Intelligence (AI) and the protection of legal rights and fair educational ethics.

II. METHOD

This study uses a qualitative research method with a normative legal approach. This approach aims to examine relevant laws and regulations, legal doctrines, and literature related to the research topic [12]. The normative legal approach allows researchers to analyze applicable legal norms and their application in practice [13]. This approach was chosen to analyze existing legal regulations related to the use of Artificial Intelligence (AI) in education and the ethics of its use. Researchers conducted a study of available literature both in print and digital form, such as textbooks, law journals, and scientific articles [14]. Then, the data obtained was analyzed using a qualitative analysis method

III. RESULTS AND DISCUSSION

The use of Artificial Intelligence (AI) in education is becoming an increasingly relevant topic along with the rapid advancement of digital technology. Artificial intelligence is a branch of computer science that imparts human-like intelligence to machines [15]. Artificial intelligence is defined as the ability of machines to learn from data and ultimately be able to carry out the desired goals [16]. Artificial Intelligence (AI) has great potential to change the way we teach and learn, from technology-based learning tailored to individual needs to the use of data to improve education management. However, despite its many benefits, the use of Artificial Intelligence (AI) in education also faces various problems, especially those related to legal regulations and ethics.

1. Legal Regulations Regarding the Use of AI in Education

The development of AI applications is so rapid with increasingly broad functions, multimodal (a combination of text, images, audio, and video) that its impact has the potential to be systemic. This gives special attention to the safety aspect of AI which requires continuous risk analysis of the social structure of society, of course this is the basis for a country to have special legal regulations related to AI. In Indonesia, regulations related to technology are specifically regulated in Law Number 1 of 2024 concerning the Second Amendment to Law Number 11 of 2008 concerning Information and Electronic Transactions (UU ITE). The ITE Law aims to handle rapid technological developments and provide legal certainty and benefits in solving technological problems. However, the ITE Law does not clearly explain the definition of AI itself, where then with the increasingly rapid development of AI technology, many opinions from various groups have arisen to interpret AI in accordance with the ITE Law in force in Indonesia [17]. The interpretation related to AI in the ITE Law can be referred to as an electronic system and electronic agent. Based on the characteristics of AI that are in accordance with the definition of an electronic system in the ITE Law, AI can collect, process, analyze, display, and transmit electronic information [18]. These characteristics are in line with the definition of an electronic system in Article 1

number 5 of the ITE Law which states that an electronic system is a series of electronic devices and procedures that function to prepare, collect, process, analyze, store, display, announce, transmit, and/or distribute electronic information. Then the definition of an electronic agent in Article 1 number 8 states that an electronic agent is a device from an electronic system that is made to carry out an action on certain electronic information automatically which is organized by a person. In this case, AI is an electronic system that is controlled by a person in doing something. AI will work to solve a problem like humans, but AI does not do the action independently or is not done alone, there must still be human intervention itself to order AI to carry out an action. The operation of this AI is connected to the organizer of the electronic system, which has the responsibility as a legal subject for the operation of the electronic system, in accordance with the provisions of Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions (PP 71/2019). Based on this, AI is not included in the legal subject because in reality AI cannot be held criminally responsible, because basically the actions carried out by AI are controlled or ordered by humans/individuals as absolute legal subjects in Indonesian criminal law.

Based on the regulations in force in Indonesia, AI is actually not a legal subject but a legal object where AI is an electronic device operated by humans in its implementation, and humans are absolute legal subjects in Indonesia. AI is not categorized as a legal subject like humans who can take legal action. However, along with the development of increasingly sophisticated technology from time to time, AI can be categorized as a legal subject or has a proper position as a legal subject that can carry out legal actions like humans and legal entities. If this happens, then to clarify the position of AI as a legal subject, the government must prepare regulations or regulations related to AI which are part of the life of the community. The development of AI in Indonesia and globally has begun. At the national level, the National Strategy for Artificial Intelligence (Stranas KA) has been formulated as the direction of national policy. The implementation of AI in government and the public sector cannot be separated from the role of the Ministry of Communication and Information of the Republic of Indonesia (Kemenkominfo RI) as the government's focal point in implementing national digital transformation. Kemenkominfo RI has the main task of assisting the President in organizing state governance in the field of communication and informatics. In the National Strategy for KA, the Indonesian Ministry of Communication and Information is the implementer in supporting the Ethics and Policy of Artificial Intelligence. Together with the House of Representatives (DPR). In December 2023, the Indonesian Ministry of Communication and Information issued Circular Letter of the Minister of Communication and Information No. 9 of 2023 concerning the Ethics of Artificial Intelligence as a guide to AI ethics needed to support the implementation of more effective technology implementation activities [19].

Legal regulations related to the use of Artificial Intelligence (AI) in education are important to ensure that this technology is used effectively, efficiently, and, most importantly, by paying attention to the principles of justice and human rights. In Indonesia, although there have been several regulations governing technology and personal data, the use of Artificial Intelligence (AI) in education does not yet have specific and integrated regulations. One important aspect that must be regulated in the use of Artificial Intelligence (AI) is the protection of personal data of students, educators, and all parties involved in the education ecosystem. In the application of Artificial Intelligence (AI), the data collected and analyzed can be very sensitive, such as academic data, behavior, and student learning preferences. Legal regulations governing the protection of personal data, such as Law No. 27 of 2022 concerning Personal Data Protection, are crucial to ensure that the use of data in AI does not violate individual privacy rights.

Based on the description above, regulations on the use of Artificial Intelligence in the form of a Law that has a regulatory and coercive nature do not yet exist. However, there are regulations that are related to the use of Artificial Intelligence which will be shown in the following table:

TABLE I. REGULATIONS, POLICIES, AND GUIDELINES RELATING TO THE USE OF ARTIFICIAL INTELLIGENCE

Form of Regulation	Things That Are Regulated
Law Number 1 of 2024 concerning the Second Amendment to Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law)	Handling rapid technological developments and providing legal certainty and benefits in resolving technological problems.
Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions	AI is not included in the legal subjects because in reality AI cannot be held criminally responsible, because basically the actions carried out by AI are controlled or ordered by humans/individuals as absolute legal subjects in Indonesian criminal law.
Circular Letter of the Minister of Communication and Information No. 9 of 2023 Concerning Artificial Intelligence Ethics	AI ethics guidelines needed to support more effective implementation of technology implementation activities
Law No. 27 of 2022 concerning Personal Data Protection	Personal Data is data about an individual who is identified or can be identified individually or in combination with other information either directly or indirectly through electronic or non-electronic systems.

However, the challenge faced is how to ensure that data collection and processing by Artificial Intelligence (AI) systems are carried out transparently and accountably. Users of Artificial Intelligence (AI) in education, such as schools and

higher education institutions, must be able to explain to the public the purpose and method of data use, and obtain clear consent from the relevant parties. According to [20], data collection and processing carried out by AI must meet the principles of transparency and accountability. Regulations such as GDPR in Europe are an important model for ensuring the security of student data [21]. In addition, Silor, 2024, emphasizes the need for a strong legal framework to limit the use of data only for educational purposes, preventing misuse by third parties [22]. These principles are important to maintain public trust in AI technology in education. The use of Artificial Intelligence (AI) in education must also consider legal responsibility if there is an error in data processing or decisions made by the Artificial Intelligence (AI) system. For example, if a decision taken by Artificial Intelligence (AI) leads to injustice or harms a particular party, who will be responsible? Is it the technology developer, the educational institution, or the user of the system? Legal regulations need to clearly define who is responsible for the use of Artificial Intelligence (AI), and how accountability mechanisms can be implemented to address potential losses or misuse of technology.

Based on the characteristics that must be covered in Artificial Intelligence regulations, the author tries to formulate ideal regulations regarding the use of Artificial Intelligence in the following table:

TABLE II. REGULATION

Form of Regulation	Things That Are Regulated
Statutory Regulations	Protection of personal data of students, educators, and all parties involved in the education ecosystem
	Criminal and civil liability for misuse of Artificial Intelligence

Vesnic-Alujevic & Nascimento, 2020, identified that one of the main obstacles in implementing AI regulations is the speed of technological development which often exceeds the existing legal framework [23]. This requires regulators to always be adaptive and collaborative with technology developers. In addition to obstacles related to inadequate legal regulations, the implementation of Artificial Intelligence (AI) in the world of education also faces various complex obstacles. Some of the main obstacles faced include:

a. Technology Access Gap

The implementation of AI in education requires adequate infrastructure, such as sophisticated hardware, fast internet connections, and trained workers. Although Artificial Intelligence (AI) offers the potential to improve the quality of education. However, the technological gap between developed and developing countries, or between urban and rural areas, is a major obstacle. Many educational institutions in remote areas do not have basic facilities to support AI technology, such as modern computer devices or stable internet access [24]. This creates an imbalance between educational institutions in urban and rural areas, or between schools with complete facilities and those that are less supportive. According to [5], it is important to ensure that all students, including those in disadvantaged areas, have equal access to AI technology. This approach can reduce global educational inequality. Donatus & Obinna, 2024, noted that government subsidies and equal distribution of infrastructure are the main solutions to prevent inequality of access [25]. The government must be able to ensure that the use of Artificial Intelligence (AI) can be enjoyed fairly by all groups, regardless of social or economic status. Therefore, there needs to be regulations that guarantee equal access to technology and reduce the digital divide.

b. Oversight and Accountability

AI in education must be implemented with strict supervision so as not to cause unwanted negative impacts. However, in practice, supervision of the use of Artificial Intelligence (AI) is often inadequate. Existing regulations need to address this obstacle by ensuring that there is an effective oversight mechanism. One way is to require educational institutions to report the use of Artificial Intelligence (AI) technology regularly and transparently, and to ensure that the technology used meets established ethical and legal standards [26]. This supervision should also include an evaluation of the results achieved by Artificial Intelligence (AI) in the learning process to ensure that technology does not harm the quality of education.

c. Abuse of Technology

Another obstacle is the potential misuse of Artificial Intelligence (AI) in education, either by technology developers, educational institutions, or other interested parties. For example, Artificial Intelligence (AI) used to collect students' personal data can be misused for other purposes that are not in accordance with educational goals [27]. Regulations governing the use of Artificial Intelligence (AI) need to contain clear provisions regarding data use, as well as strict sanctions for parties who misuse the technology. For this reason, more detailed and specific regulations are needed to protect students' rights from potential misuse of technology.

d. Human Resources Readiness

In addition to legal regulations, obstacles in the implementation of Artificial Intelligence (AI) in the world of education are also related to the readiness of human resources (HR) in facing this change. Teachers and educators need to be trained to understand and utilize Artificial Intelligence (AI) in the learning process [28]. Without adequate skills, the use of Artificial Intelligence (AI) may fail to achieve its goals. Therefore, education and training for educators are very important to consider in regulations related to the use of Artificial Intelligence (AI). Regulations also need to pay attention to competency standards for educators so that they can use Artificial Intelligence (AI) in a way that is appropriate and beneficial for students.

2. Ethics of Using AI in Education

Ethics are an equally important aspect in the application of Artificial Intelligence in Education (AIED). Cath, 2018, states that AI governance must involve the principles of transparency, fairness, and non-discrimination [29]. This aims to prevent

algorithmic bias that can affect student evaluation. Artificial Intelligence (AI), in many cases, uses algorithms to personalize the learning experience for each student. However, problems can arise if the algorithm is not developed transparently or does not take all factors into account fairly. For example, Artificial Intelligence (AI) used for automated assessment or selection of learning materials can create bias, either based on unrepresentative data or imbalances in assessment. Eden & Chisom, 2024, also underline the importance of involving humans in important decisions made by AI, such as assessment of learning outcomes [30]. Thus, algorithmic errors can be minimized. According to Nguyen et al., 2023, there are seven ethical principles for the use of Artificial Intelligence (AI) in education:[31]

1). Principles of governance and management

The governance and management of Artificial Intelligence in Education (AIED) must carefully consider interdisciplinary and multi-stakeholder perspectives as well as all ethical considerations from relevant domains, including but not limited to data ethics, learning analytics ethics, computational ethics, human rights, and inclusivity.

2). Principles of transparency and accountability

Data collection, analysis, and reporting processes should be transparent with informed consent and clarity on data ownership, accessibility, and intended use. AI algorithms should be explainable and justified for specific educational purposes.

Regulation of Artificial Intelligence in Education (AIED) should explicitly address the recognition and accountability for the actions of all stakeholders involved in the design and use of AIED, including auditability, minimization, and reporting of negative side effects, trade-offs, and trade-offs.

3). Principles of sustainability and proportionality

Artificial Intelligence in Education (AIED) must be designed, developed, and used in a justifiable manner so as not to disrupt the environment, the world economy, and society, such as the labor market, culture, and politics.

4). Privacy principle

Artificial Intelligence in Education (AIED) must ensure informed consent from users and maintain the confidentiality of users' information, both when they provide information and when the system collects information about them.

5). Safety and Security Principles

Artificial Intelligence in Education (AIED) must be designed and implemented in a manner that ensures the solution is robust enough to effectively safeguard and protect data from cybercrime, data breaches, and corruption threats, and ensure the privacy and security of sensitive information.

Artificial Intelligence in Education (AIED) systems are designed, developed, and implemented with a risk management approach so that users are protected from unintended and unexpected harm, and that fatalities are reduced.

6). The principle of inclusivity

The design, development, and deployment of Artificial Intelligence in Education (AIED) must consider infrastructure, equipment, skills, and societal acceptance that will accommodate a diverse range of individuals in the target region, enabling equitable access and use of AIED. In addition, the design, development, and deployment of AIED must employ non-discriminatory and unbiased data and algorithms to ensure fairness and equity among different groups of beneficiaries.

7). The human-centered principle of AIED

The goal of Artificial Intelligence in Education (AIED) is to complement and enhance human cognitive, social, and cultural capabilities while maintaining meaningful opportunities for freedom of choice, securing human control over AI-based work processes.

The Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) has published a Guide to the Use of Generative Artificial Intelligence (GenAI) in Learning in Higher Education. This guidebook is designed to help understand and implement the ethics of using AI in learning in higher education. The book states that higher education institutions need to ensure the ethical and responsible use of GenAI. To ensure this, each higher education institution needs to determine its own policy on the use of GenAI in learning, as one of the academic policies in higher education institutions. This policy needs to consider the five principles of trustworthiness and the nine principles of AI utilization [3].

Five principles of trust that need to be considered include:

1). Fairness: how to ensure that an AI model is fair to everyone.

2). Explainable: an AI model must be able to explain the data set, the model used and how the data was trained.

3). Robustness: guarantee that an AI model cannot be hacked intentionally, or only to harm or benefit a group of people.

4). Transparency: providing clear information that a product is generated by AI and providing a summary or metadata about the AI model used.

5). Data Privacy: use of data still guarantees the confidentiality of personal data.

Then, the nine principles in utilizing AI, include:

1). Ensure safety and security.

2). Fair and non-discriminatory.

3). Sustainable.

4). Protect personal rights and data.

5). Ensure the burden of responsibility for each stage in the GenAI system life cycle remains with humans.

6). Transparent and explainable.

7). Responsibility and accountability.

8). Awareness and literacy about GenAI.

9). Collaboration and adaptive regulation involving multiple stakeholders.

The ethics of using GenAI for learning in this guide consist of four main things, namely:

1). Academic Integrity as the embodiment of the core values of a college. There are six values related to academic integrity, namely: honesty, trust, fairness, respectful attitude, responsibility, and courage. Honesty is the foundation for every learning interaction that will foster trust in someone or something in the academic environment, foster a sense of justice, honorable behavior and mutual respect, and courage in being responsible for every behavior and action of each individual (lecturer, student, education staff).

2). Security and Data Protection that has the highest potential vulnerability and risk when associated with digital technology. GenAI technology based on the Large Language Model (LLM) causes potential threats to the security of its users' personal data. When interacting with AI, users can intentionally or unintentionally enter personal data information that will become part of the training data source for the AI model. The potential for personal data leakage in this process will threaten the security and safety of individuals as the owner/source of the data.

3). Equality and accountability in order to address potential gaps that occur when utilizing GenAI. Potential bias in the output obtained from GenAI needs to be addressed critically by lecturers and articulated to students in the GenAI-based learning process.

4). Environmental impacts due to the use of GenAI. GenAI applications, including all forms of online activities such as sending emails, conducting internet searches, accessing other online content are highly dependent on the availability of data centers that consume large amounts of electricity and water resources (for cooling). Therefore, a high level of awareness and responsibility is needed in using digital technology, so that every academic community in higher education consciously contributes directly to environmental sustainability, sustainability, and the sustainability of the shared digital ecosystem.Format the image in the textbox with good resolution, if the image has a small portion it can be made 2 columns, but if the image has a large portion can be made 1 column. The image title is below the image (center-aligned) Bold, Times New Roman 10pts.

IV. CONCLUSIONS

Indonesia does not yet have binding legal regulations on the use of Artificial Intelligence (AI) in education. Personal data protection, fair access, and ethical standards are the main pillars that must be considered in every policy related to AI. Adaptive, transparent, and inclusive regulations are the key to the successful implementation of AI in the education sector. In order to realize this, according to (O'Sullivan et al., 2019), the development of global standards can be a solution to align policies between countries, especially regarding data privacy and the ethical use of AI. In addition, recommendations that can be given include: first, accelerating the development of regulations that specifically regulate the use of Artificial Intelligence (AI) in education, second, increasing training and competence for educators in utilizing Artificial Intelligence (AI), and third, ensuring a clear monitoring and accountability system for all parties involved in the use of Artificial Intelligence (AI) in education. The author suggests further research on the impact of the Generative Artificial Intelligent (GenAI) Guidebook in Learning in Higher Education.

REFERENCES

[1] S. Diantama, “Utilization of Artificial Intelligence (AI) in the World of Education,” DEWANTECH J. Educ. Technol., vol. 1, no. 1, pp. 8–14, 2023.

[2] I. Arifdarma, “The Impact of Gpt Chat Technology on the World of Education: Potential and Challenges,” Agriwidya J., vol. 4, no. 1, pp. 56–66, 2023.

[3] Directorate of Learning and Student Affairs, Directorate General of Higher Education Research and Technology, and R. and T. Ministry of Education, Culture, Guide to The Use of Generative Artificial Intelligence (GenAI) in Learning in Higher Education. Jakarta: Directorate of Learning and Student Affairs; Directorate General of Higher Education, Research, and Technology; Ministry of Education, Culture, Research, and Technology, 2024.

[4] L. Yufei, S. Saleh, H. Jiahui, and S. M. S. Abdullah, “Review Of The Application Of Artificial Intelligence In Education,” Int. J. Innov. Creat. Chang., vol. 12, no. 8, 2020, doi: https://doi.org/10.53333/ijicc2013/12850.

[5] A. Nguyen, H. Ngan, N. Yvonne, and H. Belle, “Ethical Principles for Artificial Intelligence in Education,” Educ. Inf. Technol., vol. 28, pp. 4221–4241, 2023, doi: https://doi.org/10.1007/s10639-022-11316-w.

[6] Sahara, M. Ilmi, and R. Y. B. Silalahi, “Smart Educational Assistance Responding to AI (Artificial Intelligence) Trends in the World of Education,” Community Serv. J., vol. 1, no. 4, pp. 354–364, 2023, doi: https://doi.org/10.61231/jp2m.v1i4.169.

[7] Erwin et al., Digital Transformation. Jambi: PT Sonpedia Publishing Indonesia, 2023.

[8] S. L. Zahara, Z. U. Azkia, and M. M. Chusni, “Implementation of Artificial Intelligence (AI) Technology in the Field of Education,” JPSP J. Sci. Educ. Res., vol. 3, pp. 15–20, 2023.

[9] A. P. Setiawi et al., “The Impact of Artificial Intelligence in High School Learning,” Indo-MathEdu Intellectuals J., vol. 5, no. 1, pp. 680–684, 2024.

[10] Wiwin Rif’atul Fauziyati, “The Impact of Using Artificial Intelligence (Ai) in Islamic Religious Education Learning,” J. Educ. Teach. Rev., vol. 6, no. 2, pp. 53–61, 2023, doi: https://doi.org/10.31004/jrpp.v6i4.21623.

[11] R. Peliza, “Application of Artificial Intelligence (Ai) Technology to Increase the Effectiveness of Student Learning,” Int. Conf. Islam. Stud., vol. 2, no. 1, pp. 82–95, 2024, doi: https://ejournal.iainkerinci.ac.id/index.php/pik/article/download/3774/1238/13126.

[12] P. M. Marzuki, Legal Research: Revised Edition. Jakarta: Kencana Prenada Media Group, 2017.

[13] J. Ibrahim, Normative Legal Research Theory and Methodology. Malang: Bayumedia Publishing, 2006.

[14] L. J. Moleong, Qualitative Research Methodology. Bandung: Remaja Rosdakarya, 2017.

[15] A. Kaplan and M. Haenlein, “Siri, Siri, in my hand: Who’s the fairest in the land? On the interpretations, illustrations, and implications of Artificial Intelligence,” Bus. Horiz., vol. 62, no. 1, pp. 15–25, 2019, doi: https://doi.org/10.1016/j.bushor.2018.08.004.

[16] W. M. Baihaqi, F. Sulistiyana, and A. Fadholi, “Introduction to Artificial Intelligence for Students in Facing the World of Work in the Era of the Industrial Revolution 4.0,” RESWARA J. Community Serv., vol. 2, no. 1, 2021, doi: https://doi.org/10.46576/rjpkm.v2i1.87.

[17] S. H. Qurrahman, S. Ayunil, and T. A. Rahim, “Position and Concept of Accountability of Artificial Intelligence in Indonesian Positive Law,” UNES LAW Rev., vol. 6, no. 4, pp. 12687–12693, 2024.

[18] M. D. Akbar, J. F. Sihotang, R. Purnama, and T. Hasna, “Utilization and Problems of Artificial Intelligence in Human Life and Its Legal Regulation,” Indones. Leg. Media, vol. 2, no. 2, pp. 538–542, 2024.

[19] W. Simanjuntak, A. Subagyo, and D. Sufianto, “The Role Of Government In The Implementation Of Artificial Intelligence (Ai) In The Ministry Of Communications And Informatics Of The Republic Of Indonesia (Kemenkominfo RI,” J. Soc. Econ. Res., vol. 6, no. 1, pp. 1–15, 2024.

[20] C. Adams, P. Pente, and G. Lemermeyer, “Ethical Principles For Artificial Intelligence In K-12 Education,” Sci. Direct, 2023.

[21] F. Pedro, M. Subosa, A. Rivas, and P. Valverde, “Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development,” UNESCO, 2019.

[22] A. Silor, “Navigating the Ethical Landscape: Perspectives on Integrating Artificial Intelligence in Educational Settings,” SSRN, 2024.

[23] L. Vesnic-Alujevic and S. Nascimento, “Societal and Ethical Impacts of Artificial Intelligence: Critical Notes on European Policy Frameworks.,” Telecomm. Policy, 2020.

[24] W. Holmes, M. Bialik, and C. Fadel, “Artificial Intelligence in Education: Promises and Implications for Teaching and Learning.,” Bost. Cent. Curric. Redesign, 2019.

[25] U. O. Donatus and V. O. Obinna, “The ethical implications of artificial intelligence in education,” AJAP-AMAMIHE, 2024.

[26] A. A. Respati, “Reformulation of the ITE Law on Artificial Intelligence Compared to the European Union and China AI Act Regulation,” J. USM Law Rev., vol. 7, no. 3, pp. 1737–1758, 2024.

[27] E. Widyasari, B. Murtiyasa, and E. Supriyanto, “Educational Revolution with Artificial Intelligence: Opportunities and Challenges,” Educ. Sci. J., vol. 10, no. 2, pp. 302–311, 2024.

[28] R. N. Anwar, “Artificial Intelligence (AI) Introduction Training to Improve Teacher Competence in Digital Transformation,” J. Smart Community Serv., vol. 2, no. 1, pp. 27–36, 2024, [Online]. Available: https://journal.cahyaedu.com/index.php/jscs/article/view/43/28

[29] C. Cath, “Governing Artificial Intelligence: Ethical, Legal and Technical Opportunities and Challenges,” R. Soc. Publ., 2018.

[30] C. A. Eden and O. N. Chisom, “Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations,” Magna Sci., 2024.

[31] O’Sullivan et al., “Legal, regulatory, and Ethical Frameworks for Development of Standards in Artificial Intelligence (AI),” Wiley Online Libr., 2019.