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Article

Artificial intelligence and new era of plagiarism in education: Problem and solution

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Abstract: Artificial Intelligence (AI) in education has both positive and negative impacts, particularly in term of increasing plagiarism. This research analyzes Indonesia's plagiarism regulations and offers solutions. It uses doctrinal methods with legislative, case, and comparative studies, revealing that plagiarism is regulated but not specifically for AI involvement. The results show that plagiarism in scientific work has actually been regulated through several regulations. On the other hand, there is no regulation governing the involvement of AI in the process of preparing scientific articles. Comparative studies show that the US, Singapore, and the EU have advanced regulations for AI in education. The US has copyright laws for AI works and state regulations, Singapore's Ministry of Education has guidelines for AI integration and ethics, and the EU has the Artificial Intelligence Act. To tackle AI-related plagiarism in Indonesia, the study suggests enacting AI-specific laws and revising existing ones. Ministerial and Rector statutes should address technical aspects of AI use and plagiarism checks. The Ministry should issue guidelines for universities to develop Standard Procedures for Writing and Checking Scientific Work, using reliable AI-checking software. These measures aim to prevent plagiarism in Indonesia's educational sector.

Keywords: AI; education; plagiarism

1. Introduction

Plagiarism has been a long-standing issue, historically, the concept of originality in the ancient Greek and Roman era was not appreciated or it can be said that writers/creators often borrowed each other's works without citing them (Carter, 2023). The evolution of plagiarism continues into the modern era, which offers easy access to information (Pietsch, 2001). Furthermore, the act of plagiarism is not only in the commercial sphere such as the creation of a work of creation (music, movie, etc.), but has also entered the field of education. In general, cases of plagiarism in education according to Stephen J. Brown and Kay Hammond include reproduction of material from sources such as journals or books, without adequate acknowledgment of the source, copying other students' assignments, and ghost-written assignments (Brown and Hammond, 2022). In its development, there is also a new issue of plagiarism known as self-plagiarism, which is defined as an act of plagiarism committed by taking one's own work in whole or in part for republication.

To prevent plagiarism in the world of education, the Indonesian government issued several regulations that regulate plagiarism as an effort to protect academic ideas such as scientific articles because they have moral rights in them (Yulia, 2023). This is in line with Law Number 28 of 2014 concerning Copyright ("Copyright Law") which defines copyright as the "*exclusive right of the author vested*

automatically on the basis of declaratory principle after Works are embodied in a tangible form without reducing restrictions in accordance with the provisions of laws and regulations". The regulation of plagiarism in the Copyright Law is stated in Article 44 of the Copyright Law, which in this article emphasizes the elements of plagiarism as an act that does not include the original source of a work created by another person. The regulation of plagiarism is also emphasized in Article 25 paragraph (2) of Law Number 20 of 2003 concerning the National Education System ("Law 20/2003"), which states that if a scientific work used to obtain an academic, professional, or vocational title is plagiarized, the title will be revoked (Disemadi and Kang, 2021). Article 10 paragraph (3) of the Minister of Education, Culture, Research and Technology Regulation Number 39 of 2021 on Academic Integrity in Producing Scientific Works ("Ministerial Regulation 39/2021") reveals three classifications of plagiarism, namely: *a. taking part or all of another person's work without mentioning the source properly; b. rewriting without using one's own language part or all of another person's work even though mentioning the source; and c. taking part or all of one's own published work or ideas without mentioning the source properly.*

In its development, the presence of artificial intelligence ("AI") such as Chatbot offers convenience for obtaining information needed by service users carried out with a question-and-answer model (Goli et al., 2023). According to Apptopia data, in the first quarter of 2023, the number of AI Chatbot application downloads increased by 1506% (Putra et al., 2023). AI Chatbot have also entered education sector, providing assistance to students, lecturers, and researchers in preparing academic assignments (Labadze et al., 2023). However, the presence of AI Chatbot has the potential for plagiarism and violates academic ethics. This is proven by researchers, where many academic journals are created through ChatGpt. They conducted a search on Google Scholar through a keyword that is often used by the Chatbot (ChatGpt) to let users know how current the information is, namely "My Last Knowledge Update or Pembaruan Pengetahuan Terakhir Saya" which gave more than 100 results (Rosa, 2024).

However, there is one problem that arises when a legal subject uses an AI Chatbot to infringe on someone's copyright and cause plagiarism, especially in making scientific articles in the field of education (Lucchi, 2023). Furthermore, if seen in the current regulations in Indonesia, the Copyright Law does not recognize AI Chatbot as a legal subject (Haris and Tantimin, 2022), so AI Chatbot based on the Indonesian Copyright Law cannot be classified as a creator and the potential for AI to be recognized as a new entity related to legal subjects. In addition, authors who use AI Chatbot to conduct academic activities also cannot be classified as plagiarism, because AI Chatbot provides information. So that brings back a question, can the information obtained and collected by the author through Chatbot be categorized as plagiarism?

Considering this issue, the author of this article tries to analyze and divide it into three parts. First, the author will place the understanding and context of plagiarism in the world of education associated with AI Chatbot and adjust to the applicable laws and regulations in Indonesia. Second, the author examines the regulations regarding plagiarism in education through AI Chatbot that are regulated

in the United States, Singapore, and the European Union. Third, the author tries to initiate legal reform in Indonesia in combating plagiarism in the world of education.

2. Materials and methods

This research uses doctrinal research with the legislation, cases, and comparative studies approach (Soekanto and Mamudji, 2003). The legislation approach is used to analyze regulations related to plagiarism and AI Chatbot in education. Furthermore, the case approach is used to look at social phenomena regarding the use of AI Chatbot services in writing scientific articles in the education system in Indonesia. A comparative study approach was used to analyze the regulations regarding plagiarism in the United States and Singapore, and the steps taken by these countries to deal with the phenomenon of plagiarism using AI Chatbot. This research also uses secondary data, which includes primary, secondary, and tertiary legal materials. Primary legal materials include applicable laws and regulations in Indonesia, the United States, and Singapore. Secondary legal materials include books, academic journals, and others. Furthermore, tertiary legal materials used are online news. In analyzing and collecting the data, this research uses literature study techniques to process data and produce accurate conclusions.

3. Results and discussion

3.1. Plagiarism in the educational system: Definition, history, and legal construction in Indonesia

The concept of plagiarism has been defined in various ways, whether as *"the act of stealing and passing off (someone else's ideas or words) as one's own", "using someone else's work without acknowledging the source", or as the act of "presenting a new and original idea or product derived from an existing source*" (Park, 2003). Delves deeper into the definition of plagiarism itself, the American Historical Association in its Statement on Standards of Professional Conduct defines plagiarism as "*the use of the exact same words of another author without attribution*," and the borrowing of "distinctive and significant research findings or interpretations" without proper citation. Most cases of plagiarism are a failure to properly paraphrase, cite, and quote sources (American Historical Association, 2023). Refers to Webster's Dictionary, it can be identified that the meaning of plagiarism is "*the use of materials from unknown sources or direct citation of items from established references without indicating that the words have been copied verbatim from such references"* (Memon, 2020). While reference to the Indonesian language, the term "*plagiarism*" as defined in the Indonesian Dictionary (KBBI) encompasses the concept of "*plagiarism that violates copyright*" (Suriyani et al., 2023). Historically, the plagiarius concept, Latin word which means plagiarism, was pioneered by a man named Martial, a 1st century Roman poet who complained that another poet had stolen his poetry (Plate, 2011). In 1601, Ben Jonson introduced "plagiary" as a derivative word from "plagiarus", meaning a state of literary theft. This term evolved by 1620 to give birth to the derivative word 'plagiarism,' which was introduced as an English expression (Cook, 2014). Observing the history of the

practice of plagiarism in relation to a true creation cannot be separated from the development of literature where when entering the renaissance (era of enlightenment) the works of a creator are recognized and appreciated individually. The first legal instruments that became the legal basis in guaranteeing the rights of creators was finally established in England through The Copyright Act of 1710 during the Queen Anne period, commonly known as The Statute of Anne in the Intellectual Property Circle (Khong, 2006). Section 8 of Anne c. 21, known as the long title of the Statute of Anne, outlines its primary objective as an "Act for the Encouragement of Learning". It grants authors and purchasers exclusive rights over their printed works for a limited time. The statute addresses the growing issue of unauthorized printing and reprinting by printers, booksellers, and others, which had caused significant harm to authors and their families. In response, the statute aimed to prevent such practices by providing legal protection, encouraging scholars to produce useful works. Authors were granted the exclusive right to print and reprint their books for a period of 21 years for existing works and 14 years for newly composed works, ensuring that these rights were enforceable from the date of publication. This marked an important step in intellectual property law by formalizing the rights of creators and setting limits on their duration.

From this statute, it's understood that there are protective measures for publishers against book piracy, as well as for the right of authors against unauthorized reproduction. In connection with the development of legal arrangements regarding plagiarism in the world of education, especially works that are poured through books, journals or other forms, the regulation has actually begun to be emphasized through The Berne Convention for the Protection of Literary and Artistic Works of September 9, 1886 and its amendments ("Berne Convention"). Reference to Article 2 of the Berne Convention stipulates the following:

"Protected Works:
Literary and artistic works;
Possible requirement of fixation;
Derivative works;
Official texts;
Collections;
Obligation to protect; beneficiaries of protection;
Works of applied art and industrial designs;
News."

Article 2 Paragraph (1) of the Berne Convention expands the definition of "literary and artistic works," making it clear that this includes a broad range of creations across various fields. It encompasses not only traditional works such as books, pamphlets, and other writings, but also lectures, sermons, and dramatic works, including musical compositions, choreographic performances, and silent theatrical productions. Furthermore, the article recognizes cinematographic works and those created through analogous processes, along with visual arts such as drawings, paintings, architecture, and sculpture. It also covers photographic works, applied arts, and various illustrative forms such as maps, sketches, and three-dimensional works related to geography, architecture, and science. This expansive definition ensures that diverse forms of creative expression are afforded copyright

protection, reflecting the comprehensive scope of intellectual property rights within the Berne Convention.

Global awareness of the possibility of violation of copyrighted works that can occur as a result of the use of technology indirectly encourages the enactment of the WIPO Copyright Treaty of 1996 ("Copyright Treaty") as an international convention derived from the Berne Convention (Sari, 2009). Article 11 of the Obligations Section regarding Technological Measures in Copyright Agreements highlights the importance of legal protection against the circumvention of technological measures implemented by authors. It mandates that contracting parties provide adequate legal safeguards and effective remedies to prevent the unauthorized bypassing of these technological tools. Such measures are used by authors to control the use of their works under the rights established by this Treaty and the Berne Convention. The provision is designed to restrict unauthorized actions related to the works, ensuring that authors maintain control over their intellectual property unless permitted by law

When looking at the development of legal arrangements related to plagiarism in the field of education in Indonesia, it can at least be divided into three legal regulatory regimes, namely in the specialized civil law regime, state administrative law, and criminal law.

3.1.1. Examination in Indonesia special civil law system

In the perspective of Indonesian special civil law system, the issue of plagiarism in the field of education is closely related to the issue of violation of copyright on a work owned by another party as stipulated in the Copyright Law. The provisions regarding a written work as a work that has exclusive rights are explicitly regulated in Article 40 a paragraph (1) jo Article 4 of the Copyright Law that:

> *"(1) Protected creations include creations in the fields of science, art, and literature, consisting of:*
>
> *a. books, pamphlets, illustrations of published works, and all other written works...."*
>
> *In conjunction*
>
> Article 4 of the Copyright Law
>
> *"Copyright as referred to in Article 3 A is an exclusive right consisting of moral rights and economic rights"*

Furthermore, regarding the guarantee of the protection of the work from acts of plagiarism is regulated through Article 7 paragraph (3) jo. Article 9 paragraph (3) of the Copyright Law that:

> *"Copyright management information as referred to in paragraph (1) and Copyright electronic information as referred to in paragraph (12) owned by the Creator is prohibited from being removed, altered, or damaged."*
>
> *In conjunction*
>
> Article 9 paragraph (3) of the Copyright Law
>
> *"Any person who without the authorization of the Creator or Copyright Holder is prohibited from copying and/or commercial use of the work."*

As for the context of the use of other articles or books as a reference in the writing process of a scientific work can be considered not as a copyright infringement (not plagiarism) as long as it is not done for commercial purposes and

is done by fully listing the source (citation). Chapter VI of the copyright regulations addresses copyright restrictions in Article 44 A, paragraph (1), stating that the use, retrieval, duplication, or alteration of a creation or product related to rights is not considered an infringement of copyright if the source is properly cited. This applies specifically to purposes such as education, research, writing scientific articles, preparing reports, or critiquing and reviewing issues, provided that these activities do not adversely affect the legitimate interests of the creator or copyright holder.

Based on this, it is understood that the creation of a paper or book in the world of education without proper citation of copyrighted works can be considered an act of copyright infringement (Disemadi and Kang, 2021).

3.1.2. Examination in state administrative law system

The concept of plagiarism in the state administrative law regime must be placed in two aspects, the first is "the position of the University Rector as a state administrative official" and "Sanctions for acts of plagiarism committed as State Administrative Decisions (de handelingen die naar hun aard gericht op een bepaald rechtsgevolg)". While there is no specific legislation in Indonesia addressing this, several State Administrative Court Decisions have clarified that the Rector's Decree falls within the scope of State Administrative Decisions subject to legal challenges. As in the case that attracted the Rector of a State University, namely the Rector of Alauddin Makassar State Islamic University for his decision made against a Lecturer (*vide* Decision No. 78K/TUN/2012) and the Decision of the Rector of Malang State University which was sued to the State Administrative Court (*vide* Decision No. 311K/TUN/2010). As for the Rectors of Private Universities, in fact the Supreme Court of the Republic of Indonesia through its decisions has also confirmed their position as State Administration Officials as stated in the case of the Rector of Trisakti University (*vide* Decision No. 61K/TUN/1999) and the Rector of Tarumanegara University Jakarta (*vide* Decision No. 210K/TUN/2001). Observing the existence of the Rector as a State administrative official and its relation to acts of plagiarism committed by students in the process of preparing articles, basically points to the existence of "administrative sanctions that can be decided through a Rector's Decree". In the framework of Indonesian positive law, sanctions for the revocation of academic degrees and other administrative penalties in cases of proven plagiarism are stipulated in Article 25 paragraph (2) of Law No. 20 of 2003. The provision states that: "University graduates whose scientific works, used to obtain academic, professional, or vocational degrees, are proven to be plagiarized will have their degrees revoked." This regulation underscores the seriousness of academic integrity, imposing strict consequences for any fraudulent actions in obtaining educational qualifications.

The three classifications of plagiarism in education are outlined in Article 10 paragraph (3) of Ministerial Regulation 39/2021, including:

"a. taking part or all of another person's work without mentioning the source appropriately;

b. rewriting without using one's language part or all of another's work even though mentioning the source; and

c. taking part or all of one's work or ideas that have been published without mentioning the source appropriately".

Following up on the Ministerial Regulation, Indonesian universities further reaffirmed the rules regarding plagiarism in scientific writing through their respective University Regulations. Some examples are Udayana University and Jember University. Specifically, Udayana University sets a plagiarism-free academic culture standard through the Udayana University Rector Regulation Number 2 of 2023 concerning Udayana University Standards, CHAPTER IV concerning UNUD Research Standards, Point 4.1.4 number 2 that:

"The Head of Udayana University together with the Head of the Research and Community Service Institution in accordance with their respective authorities guarantee that the research results referred to in point (1) are all outputs produced through activities that fulfill scientific principles and methods systematically according to scientific autonomy and academic culture and are free from plagiarism".

Furthermore, the University of Jember has also regulated the prohibition of plagiarism in writing scientific articles along with the sanctions that can be imposed following the provisions of CHAPTER 2 on Academic Ethics, Point 2.2 number 6 jo, Point 2.3 of the University of Jember Chancellor's Regulation Number 17 of 2021 concerning the Implementation of Education at the University of Jember ("UNEJ Chancellor's Regulation 17/2021"), which:

"The Head of Udayana University together with the Head of the Research and Community Service Institution in accordance with their respective authorities guarantee that the research results referred to in point (1) are all outputs produced through activities that fulfill scientific principles and methods systematically according to scientific autonomy and academic culture and are free from plagiarism".

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"In the last ten years, violations of academic ethics have been of concern to the public, including cheating in examinations, cheating, jockeying, plagiarism of scientific articles, and others."

6. committing acts of plagiarism:

a. publishing works: reports, assignment papers, articles, theses, theses or dissertations made by ordering or buying from others;

b. recognizing or using the work: reports, assignment papers, articles, theses, theses or dissertations of people who first wrote or published as their work;

c. using, publishing or displaying other people's ideas or ideas in the form of data, text, audio, video or other forms without referring to, or obtaining the consent of the owner;

d. using other people's ideas in one's own language without adequate reference to the source or obscuring the source;

e. submitting assignments, papers, articles or academic reports such as practicum reports, field studies, and internships that are the same or similar to other people's work that has been submitted before.

Point 2.3 UNEJ Rector Regulation 17/2021

"…. Sanctions given to students who commit fraud/violations of academic ethics can be in the form of:

1) warning either directly / orally or in writing by a lecturer or employee who is authorized in writing by the faculty leader;
2) reduction of learning outcomes from courses taken to the lowest E by the lecturer in charge of the course;
3) cancellation of grades that have already been obtained/given after being proven to have violated academic ethics;
4) terminating scholarships or other educational assistance;
5) suspension for 6 months to 1 year;
6) returning the student concerned to his/her parents."

Based on this, it becomes clear that the act of plagiarism in the process of writing scientific articles in the world of education can have logical-juridical consequences with the imposition of sanctions by the Minister or Rector for acts of plagiarism to students or lecturers in the context of being a State Administrative Official who can issue a State Administrative Decree.

3.1.3. Examination in criminal law system

The concept of plagiarism in the state administrative law regime must be placed in two aspects. In the context of Indonesia's criminal law system, plagiarism is addressed in Article 380 of the Indonesian Criminal Code ("Criminal Code"). This article stipulates that any individual who falsely affixes a name or mark to a literary, scientific, artistic, or handicraft work, or who alters the true name or mark with the intent to mislead others into believing it is the work of the named individual, shall face penalties. Specifically, such actions are punishable by a maximum imprisonment of two years and eight months or a fine of up to five thousand rupiahs. Additionally, anyone who intentionally sells, offers for sale, delivers, or imports into Indonesia any work that bears a false name or mark, or whose genuine name or mark has been tampered with, will also incur the same penalties.

The provisions of Article 380 of the Criminal Code outline the elements of the criminal offense of falsely affixing a name or mark and falsifying the real name or original mark on literary works, scientific works, and crafts in other words, this element is an act of theft of other people's creations on behalf of himself as the creator. Law 20/2003 serves as a lex specialis to the Criminal Code concerning education and specifically addresses plagiarism through Article 70. This provision states that any graduate found to have committed plagiarism in their scientific work—used to obtain an academic, professional, or vocational degree as outlined in Article 25 paragraph (2)—is subject to criminal sanctions. The penalties include a maximum imprisonment of two years and/or a fine of up to Rp200,000,000.00 (two hundred million rupiah).

It should be noted that both Article 380 of the Criminal Code and Article 70 of Law 20/2003 are ordinary offenses and not complaints. An ordinary offense in

Indonesian criminal law is an offense (criminal offense) that can be processed directly by the investigator without the consent of the victim or the injured party. Examining the construction of Indonesian legal arrangements in relation to the practice of plagiarism of written works carried out by involving an AI, has not yet been comprehensively regulated in legislation. In reality, the legal construction of AI in Indonesia is often interpreted in its concept as an Electronic Agent as stated in Article 1 of Law Number 19 of 2016 concerning Amendments to Law Number 11 of 2008 concerning Electronic Information and Transactions ("ITE Law") and Article 1 point 3 of Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions ("PSTE Law"). Article 1 of the ITE Law and Article 1 (3) of the PSTE Law basically define an Electronic Agent as a device that is part of an electronic system with the aim of performing an action in terms of electronic information automatically organized by an individual or company. If we look at the phrase "organized", it can be concluded that there is an Electronic System Operator (who is also the controller of the Electronic Agent) (Putra dkk., 2023). So that by looking at these regulations, it can also be concluded that there is a legal relationship between the Electronic System Operator (PSE) and the Electronic Agent User, where AI acts as an Electronic Agent which is part of the PSE itself. In relation to this matter, it is explicitly regulated in Article 36 paragraph (1) of The PSTE Law that states:

> *"Electronic system providers can organize their own electronic systems or through Electronic Agents."*

Examining the construction of the legal relationship between PSE and AI as an Electronic Agent, the question arises as to which party is liable in the event of a legal event of plagiarism. Talking further about this matter, the vagueness will certainly indirectly place AI service users (Students/Lecturers/Researchers) as the most likely party to be held liable in Indonesia, plus the legal fact that they are also the party who provides information orders to AI services. In another perspective, based on the author's search, no specific regulation addresses AI role in preparing scientific articles, especially those that lead to or fulfill the elements of an act of plagiarism either at the level of Laws, Implementing Regulations or other technical regulations in Indonesia.

3.2. Plagiarism policies in the education system in the United States, Singapore, and the European Union

The advent of AI has generated considerable interest on the global stage, presenting a multitude of potential applications in various fields, including education and research (Nuryadin and Marlina, 2023). However, along with these advancements come new challenges, particularly regarding plagiarism in scholarly works. For instance, the United States has incorporated AI considerations into its copyright laws, emphasizing the need for human authorship to claim copyright protection, thereby indirectly addressing the issue of AI-enabled plagiarism. Similarly, Singapore's Ministry of Education has issued guidelines promoting the ethical use of AI in education, ensuring that students understand the importance of proper attribution, even when using AI tools. The European Union, with its

comprehensive AI Act, has classified educational AI systems as "high-risk", enforcing strict regulations to safeguard academic integrity.

3.2.1. The United States

In the United States, the regulation of AI in education continues to evolve in response to technological change and the need to ensure that the use of AI is ethical, safe, and beneficial to students and educational institutions. Plagiarism in the United States is becoming more complicated as technology, including AI, develops. However, the issue of plagiarism by AI in the United States is not specifically addressed by existing legislation. Amendments to the US Copyright Act have expanded the definition of "original work" to include creations produced with the assistance of technology, including AI (Gaffar and Albarashdi, 2024). This provides a legal basis for copyright protection of works created with the aid of AI and underscores the necessity to prevent plagiarism in the context of AI use. Additionally, the US Copyright Act Code § 102 provides a clear definition of copyright protection. According to Section 102(a), copyright protection applies to original works of authorship that are fixed in any tangible medium of expression, whether currently known or developed in the future, allowing them to be perceived, reproduced, or communicated directly or through a machine or device. The Act outlines several categories of works of authorship, which include:

(1) literary works;
(2) musical works, including any accompanying words;
(3) dramatic works, including any accompanying music;
(4) pantomimes and choreographic works;
(5) pictorial, graphic, and sculptural works;
(6) motion pictures and other audiovisual works;
(7) sound recordings; and
(8) architectural works.

A work is deemed "fixed" in a tangible medium of expression when its representation in a copy or phonorecord is sufficiently permanent or stable, allowing it to be perceived, reproduced, or communicated for a duration that exceeds a mere transitory period. Furthermore, the issue of plagiarism in scientific articles is closely associated with Section 102 (a) of the US Copyright Act, which pertains specifically to literary works. Section 101 of the Act defines literary works as "works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, films, tapes, disks, or cards, in which they are embodied". This broad definition encompasses various formats, indicating that any unauthorized copying or plagiarism of such works would violate copyright law.

There is no regulation regarding copyright in relation to AI in the US (Zhuk, 2023). However, the explicit regulation can be seen from the US Copyright Act which states that works made with AI's help can have copyright protection if they meet certain conditions as mentioned in Section 102 (a) US Copyright Act, which is capable of creating an original work. The work must not be plagiarized, must not plagiarize the work of others, and must not infringe on the copyrights of others. In addition, the US Copyright Office also announced that works created with the help

of AI can be copyrighted, provided that the work involves sufficient human authorship (Gourvitz and Ameri, 2023).

California, recognized for its tech industry and privacy concerns, has been leading in AI regulation (Kemp, 2024). The importance of regulating the use of AI in education stems from a number of complex issues. One of them is the concern for student privacy. As AI is increasingly used in education, like for exams or analyzing student progress, protecting student data from misuse is crucial. The use of AI technology also raises ethical questions about fairness, discrimination, and transparency, one of which is the concern for student privacy. With the widespread use of AI technologies in various aspects of education, such as exam proctoring and analyzing student performance, the need to protect student data is becoming increasingly important. Additionally, ethical questions about fairness and transparency have come under scrutiny, especially in the context of academic decision-making and student assessment. Plagiarism is also a major focus of attention, given the potential for students to manipulate or copy work from unauthorized sources with the help of AI technologies.

In 2024 the California senate introduced Senate Bill 1047, a goal is California wants to lead the world in artificial intelligence innovation and research, through companies large and small, and through its outstanding public and private universities (Kemp, 2024; Ray and Wang, 2024). Senate Bill 1047 reflects the California government's proactive approach to the rapid development of artificial intelligence (AI) and its implications. The Legislature acknowledges California's leadership in AI innovation and research, driven by various companies and supported by esteemed public and private universities. It highlights AI's potential to deliver significant benefits to Californians and the state's economy, including advancements in medicine, wildfire forecasting, and climate science. However, the bill warns that without adequate human oversight, future AI developments could pose risks to public safety, enabling the creation and proliferation of weapons of mass destruction and enhancing cyber-offensive capabilities. Consequently, the state recognizes its essential role in maximizing the benefits of AI technology while mitigating severe risks, ensuring that access to AI innovation and resources is available to both large companies and academic researchers, fostering an inclusive environment for progress in this transformative field.

There are also relevant federal laws that may affect the use of AI in education across the United States, like the Family Educational Rights and Privacy Act (FERPA) (US Department of Education, 2021), these are federal laws that protect student privacy and regulate how student data can be used and shared by educational institutions. While the Family Educational Rights and Privacy Act (FERPA) does not specifically address the use of artificial intelligence (AI), it plays a crucial role in safeguarding student privacy in the context of AI technologies in education (US Department of Education, 2021).

FERPA is a federal law designed to protect the privacy of student education records and applies to all schools receiving funds from the US Department of Education. Schools are required to inform parents and eligible students annually of their rights under FERPA, though the method of notification is left to the discretion of each institution. Generally, schools must obtain written consent from parents or

eligible students before releasing any information from a student's education record. However, FERPA permits disclosure without consent under certain conditions, including to school officials with legitimate educational interests, other schools to which a student is transferring, specified officials for audit purposes, parties involved in financial aid, organizations conducting studies on behalf of schools, accrediting bodies, compliance with judicial orders, and during health and safety emergencies, among others (34 CFR 99.31). FERPA grants rights to parents regarding their children's education records, obligating local education agencies (LEAs) to notify them annually about these rights (34 CFR § 99.7). Parents or eligible students have the right to inspect and review education records and request corrections to records they believe are inaccurate or misleading.

Additionally, non-profit organizations and regulatory bodies also contribute to regulating AI's role in teaching and addressing issues related to plagiarism.

On the plagiarism front non-profit organizations and regulatory bodies are also involved in regulating AI in teaching. One example is the Consortium for School Networking (CoSN), which publishes guidelines and resources on the use of AI technologies in education, covering issues such as privacy, fairness, and transparency (Teach for America, 2023). In the United States, almost all educational institutions have adopted AI technology to help detect and prevent plagiarism. Some platforms and software use AI algorithms to check for similarities between student work and sources that exist online or in the school's internal database (Ta and West, 2023), such as Turnitin and Copyscape. Turnitin is one of the most commonly used plagiarism detection software by educational institutions in the US The software uses AI technology to check for similarities between student work and sources online and in the school's internal database. Meanwhile, Copyscape is a tool that plays a role in detecting whether the writing is AI-derived. The plagiarism detection results from these two applications will be used by teachers or administrators to follow up on plagiarism cases. While there are no federal regulations that specifically address the use of AI for plagiarism detection, many educational institutions have internal policies and guidelines regarding academic ethics and law enforcement.

These policies typically include procedures for handling cases of plagiarism, including sanctions that may be imposed on students found to have plagiarized. For example, the University of California issued a code of conduct that sets forth standards of conduct to be followed by students, prohibitions against plagiarism, and sanctions to be imposed (UCLA Dean of Students, 2021). The regulation of AI in education is an evolution underway as the technology evolves and the implications are understood.

California government and state educational institutions continue to monitor developments in AI use in education and make necessary adjustments to existing regulations. On 3 January 2024, Senators Steve Padilla and Scoot Wiener introduced two AI-related bills in California. Senator Steve Padilla introduced Senate Bill 892, a bill that requires California tech to set strong standards for security, privacy, and non-discrimination for AI-based services (Gandharv, 2024). In addition, the legislation also prohibits the state of California from contracting with AI service providers that do not adhere to the established standards. Senator Scott Wiener also took a step forward by proposing a bill that targets "frontier" AI systems that have

high computing capacity (Gandharv, 2024). The bill proposes that systems that require a certain amount of computing power to train, which has yet to be specified, should meet transparency requirements. It also includes the establishment of legal liability for those who fail to take appropriate precautions to prevent unintended consequences and harmful uses of AI. Senator Scoot Wiener also introduced Senate Bill 893, which proposes the creation of an AI Research Center in California that would be a hub for academics to access critical computing and data resources. The goal is to foster innovation and research in AI in the state. In addition, the bill, introduced by Senator Scoot Wiener, also calls for the creation of "CalCompute", a state research cloud that would provide the necessary computing infrastructure for groups outside of large industries, such as academia and startups, to conduct advanced AI work (Perigo, 2023).

According to the data, AI technologies are being utilized more frequently in education throughout the United States. A growing number of educational institutions are implementing AI technologies for a variety of learning and assessment purposes. In 2021, the International Society for Technology in Education (ISTE) conducted a study that discovered that roughly 70% of educational institutions in the United States have either already integrated or intend to integrate AI technologies in student learning and assessment within the next two years (ISTE, 2017). The evidence presented suggests that the integration of AI in education is a crucial component of the expanding education system. Furthermore, a survey conducted by the American Association of School Administrators (AASA) found that most school administrators in the United States say they see the potential for AI technologies to improve the efficiency and effectiveness of teaching and learning. Nonetheless, it is crucial to consider the ethical and privacy concerns related to the implementation of AI technologies in the field of education (AASA, 2023). The timeline illustrating the evolution of AI regulation in education, highlighting key events in the United States, is presented in **Figure 1**.

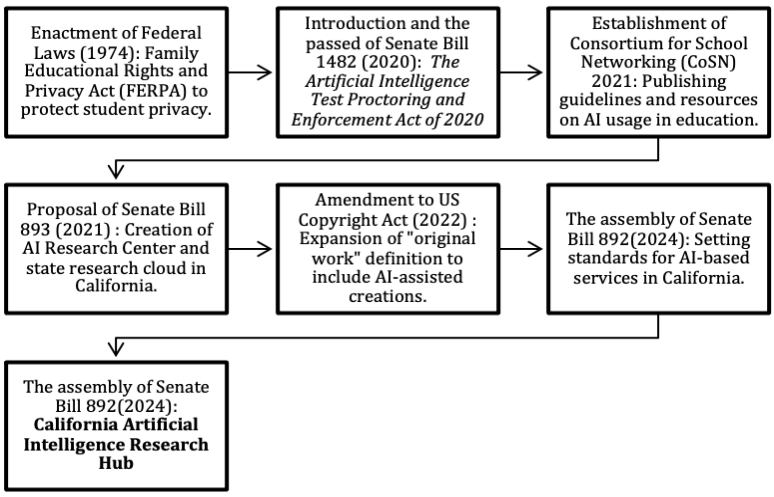

Figure 1. Evolution of AI regulation in education: A timeline of key events in the United States.

3.2.2. Singapore

Plagiarism is a major concern in Singaporean education, prompting institutions like Singapore Polytechnic (SP) and the International Baccalaureate (IB) to emphasize source acknowledgement, even for AI-generated content. While AI tools such as ChatGPT are endorsed, their ethical use is paramount, requiring proper citation. Turnitin and similar software are deployed by educational institutions to identify and deter plagiarism, with penalties varying from reprimands to expulsion. Singapore, as one of the world's leading education and technology hubs, has taken significant steps in regulating the use of AI in its education system (Lim and Seah, 2023). This is not only in response to the rapid development of technology but also as part of their strategy to prepare future generations with relevant skills to face future challenges. From the beginning, the Singapore government has understood that AI technology has great potential to improve the efficiency, quality, and accessibility of education. However, they also recognize that the use of AI in the context of education requires proper arrangements to ensure its success and sustainability (Miao et al., 2021).

Singapore has taken note of the importance of regulating the use of AI in education in response to the global demand for preparing individuals for the Industrial Revolution 4.0. Singapore's Ministry of Education ("SMoE") has taken concrete steps to regulate the use of AI in education. On 1 October 2022, SMoE issued official guidelines that aim to guide schools and educational institutions in the use of AI technologies (Lim and Seah, 2023). The guidelines cover aspects such as the integration of AI in the curriculum, teacher training, the development of AI innovations, and ethical and privacy regulations regarding the use of student data. The guide focuses on developing AI skills for students, emphasizing the importance of incorporating AI elements into the education curriculum from elementary to advanced levels, including learning basic AI concepts and practicing AI coding and programming. Not only students but also teachers and education staff need to understand AI. Therefore, the SMoE provides continuous training and professional development for teachers in May 2022, this training aims to enhance their understanding of AI and how to integrate it into learning and cover a wide range of topics, from the introduction of basic AI concepts to the practical application of AI in teaching and learning (Govtech Singapore, 2023).

Additionally, SMoE has facilitated collaborations between educational institutions and technology companies to provide teachers with practical experience in using AI technologies in educational settings. The use of AI in education poses ethical and security challenges that require careful consideration. To address these concerns, Singapore has implemented regulations governing the use of AI technologies in education. The Singapore government issued the Personal Data Protection Act 2012 ("PDPA"), which includes provisions for protecting student data in the context of AI use in education. The Act provides a comprehensive framework for managing and protecting student data when used for AI training or decision-making (PDPC Singapore, 2024). It outlines rules for data collection, use, storage, and updates, as well as sanctions for violations committed by educational institutions or technology companies.

"Section 21 (2) PDPA:

1) An organisation is not required to provide information under section 21 (1) in respect of –

(a) opinion data kept solely for an evaluative purpore;

(b) any examination conducted by an education institution, examination scripts and, prior to the release of examination results, examination results; ....”

Plagiarism, whether performed by humans or AI, is a serious breach of academic ethics. In Singapore, cases of plagiarism can result in a range of consequences, from reprimands to dismissal from the educational institution, depending on the severity of the offense and the policies of the institution (Teh, 2019). In Singapore, the crime of plagiarism is governed by various regulations and ethical aspects. Although there are no specific regulations that address plagiarism in the education sector, relevant regulations can be applied in the context of plagiarism. The Singapore Copyright Act 2021 (“CA 2021”) governs the protection of original works against unauthorized reproduction and copying, including instances of plagiarism. Under Section 41 of the Act, a “copy” of an authorial work is defined as any reproduction of the work in a material form. Specifically, subsection (2) clarifies that an authorial work is considered reproduced in material form when it is converted into or from a digital or other electronic machine-readable format, whether this conversion is from or into a copy in the form of a film or sound recording, or through other means. This provision emphasizes the Act’s comprehensive approach to copyright protection, ensuring that both traditional and digital forms of reproduction are covered under its regulations.

In addition, the CA 2021, as exemplified by the significant updates in the CA 2021, serves as a robust protector of creative works, adapting to the digital age while strengthening the framework against unauthorized use and advancing the rights of creators.

“Section 41 CA 2021:

(1) To avoid doubt, this section applies in relation to an adaptation of a literary, dramatic or musical work as it applies in relation to an authorial work.”

The determination of whether AI-generated outputs constitute plagiarism is complex, taking into account ethical, legal, and contextual factors. AI use in Singapore’s academic and professional settings is governed by strict policies and codes of conduct, including the SMoE, PDPA, CA 2021, and Intellectual Property Office of Singapore’s Guidelines. The question of whether AI outputs can be considered plagiarism is contingent upon the aforementioned regulations. Despite AI content not originating from a human creator, failure to acknowledge or obtain consent from the original data or algorithm creator may still constitute plagiarism. Consequently, it is of paramount importance to respect intellectual property rights by appropriately attributing AI-generated content. The analysis indicates that while legislative changes have contributed to heightened awareness and a framework for addressing AI misuse, there is still room for improvement. Countries like Singapore, which have taken a more proactive stance in integrating ethical AI use in education, show promising results. These examples provide empirical support for Indonesia to

consider revising its regulations, incorporating AI-specific provisions, and developing robust monitoring systems.

3.2.3. The European Union

The European Union (EU) is known for its strict digital regulations. To ensure the public's safety, the EU has established the General Data Protection Regulations ("GDPR"), which has become a model for many countries in regulating digital ecosystems (Rommetveit and van Dijk, 2022). The EU is also seeking to regulate AI to guarantee optimal conditions for the advancement and utilization of this innovative technology. AI has the potential to bring about numerous benefits, including enhanced healthcare, safer and cleaner transportation, more efficient manufacturing, and cheaper and more sustainable energy. In April 2021, the European Commission proposed the inaugural EU regulatory framework for AI (Mancheva, 2021). According to this framework, AI systems that can be used in diverse applications are to be analyzed and classified according to the risks they pose to users. The differing risk levels will consequently result in varying degrees of regulation (European Parliament, 2023). The European Commission first proposed the AI Act in April 2021.

In June 2023, the European Parliament established its stance, leading to the initiation of negotiations for the new legislation. A provisional agreement was achieved on 9 December 2023, marking a key milestone in the Act's development. In February 2024, representatives from EU member states formally endorsed the final text of the AI Act. Subsequently, the Act was presented for a vote to the EU Parliament's Committee on Civil Liberties, Justice and Home Affairs (LIBE) and the Committee on the Internal Market and Consumer Protection (IMCO), where it received overwhelming support. This progress set the Act on a path toward becoming law, with final parliamentary approval anticipated in April. Following its approval, the Act is set to take effect two years later (Jadek, 2024). Section 3 of the AI Act outlines the transformative potential of artificial intelligence, describing it as a rapidly evolving family of technologies that can deliver significant economic and societal benefits across numerous industries and social sectors. AI's ability to improve predictions, optimize operations and resource allocation, and personalize digital solutions offers companies a competitive edge. It also supports socially and environmentally beneficial outcomes, particularly in areas such as healthcare, agriculture, education, infrastructure management, energy, transport, public services, justice, and climate change mitigation and adaptation.

While the regulation recognizes education as a beneficial area, it also identifies it as a "high-risk" category. This classification means that, like other areas such as law enforcement and border control, AI systems used in education will be subject to stricter regulations. Specifically, AI systems that are used to determine access to educational institutions or to assess students' abilities fall under this high-risk category (Maynard, 2024). The law emphasizes the importance of AI literacy in various sectors, including education, through education and training programs. It aims to ensure that providers and users of AI systems are able to understand the fundamentals, risks, and benefits of AI. However, there are concerns about how to distinguish between AI systems that enhance education and those that discriminate

against students. Amendments to the law further clarify the implications for education. On 14 June 771 amendments to the original draft act were proposed and adopted. Many of these address issues around foundation models and generative AI that emerged since the original act was drafted. They also address AI in education more specifically. Six amendments specifically address the intersection of artificial intelligence (AI) with education and learning, while additional amendments may have indirect implications for the educational sector. The first amendment, Amendment 65, reflects significant changes in how AI systems are viewed in the context of education.

The original text emphasized the high-risk nature of AI systems used in education or vocational training, particularly regarding their role in determining access to educational institutions or evaluating individuals through tests. It highlighted the potential violation of the right to education and the risk of perpetuating historical discrimination if these systems were improperly designed or used.

In contrast, the amended text recognizes the importance of deploying AI systems in education as a means to modernize educational frameworks, enhance educational quality both online and offline, and expand access to digital education for a wider audience. However, it retains the classification of AI systems used for critical functions—such as admission decisions, assessing appropriate educational levels, or monitoring student behavior during tests—as high-risk. The amendment underscores that if these systems are poorly designed or utilized, they could infringe on the right to education and exacerbate discrimination against marginalized groups, including women, certain age demographics, individuals with disabilities, and those from specific racial, ethnic, or sexual orientation backgrounds. This amendment clearly highlights the potential advantages of AI in education, emphasizing its role in "modernizing entire education systems, enhancing educational quality—both offline and online—and accelerating digital education, thereby making it accessible to a wider audience." While the act safeguards against discriminatory applications of AI in education, it simultaneously advocates for systems aimed at improving educational outcomes. However, the challenge lies in distinguishing between AI systems that genuinely enhance education and those that may inadvertently discriminate against certain learners, as the two could often seem interconnected.

Amendment 214, along with Amendment 213, revises Article 4 of the draft regulation to establish overarching principles for all AI systems and promote AI literacy. Amendment 213 is particularly contentious, as it directly concerns the development and application of foundational models that underpin generative AI systems like ChatGPT, which could significantly influence more sophisticated uses of AI in education as education-specific models are created. In contrast, Amendment 214 focuses on immediate educational opportunities and challenges by requiring the promotion of AI literacy across various sectors. It requires the Union and Member States to implement measures that cater to the diverse needs of different groups, ensuring gender and age balance to support democratic oversight of AI systems. Providers and deployers of AI are responsible for ensuring their staff have adequate AI literacy, tailored to their technical expertise and the specific context of AI usage. The amendment emphasizes that literacy initiatives should include fundamental

concepts and skills related to AI systems, encompassing their types, functionalities, risks, and benefits. Furthermore, it highlights that achieving a sufficient level of AI literacy is crucial for compliance with the relevant regulations. This directive encourages educational institutions to develop AI-specific programs and curricula, ensuring all students receive essential training in AI literacy.

From the perspective of a higher education institution, this amendment highlights the critical need to integrate AI literacy and skills across all areas of the curriculum—not only for engineers and computer scientists but also in the arts, humanities, social sciences, and beyond. It underscores the importance of equipping students with the knowledge to navigate both the risks and benefits of AI systems. Building on the Act, we propose that universities treat AI literacy as a core competency, falling under the "general education" or "general studies" requirements that many institutions currently uphold. However, challenges arise with the fourth point, which defines AI literacy as the "ability of providers and deployers to ensure compliance and enforcement of this Regulation." It is essential to broaden the scope of AI literacy beyond mere regulatory compliance, as fostering a vibrant AI-enabled future involves much more than understanding specific regulations.

The original draft of the EU AI Act identifies specific high-risk AI applications in Annex III, and the amendments from June 14 explore these in detail. Amendments 715, 717, and 718 specifically address issues related to education. Amendment 715 modifies an existing clause, while 717 and 718 introduce new provisions. It categorizes AI systems that significantly influence educational decisions, such as determining access or making admissions decisions, as high-risk. This classification necessitates rigorous oversight, as these systems can substantially shape individuals' educational and vocational opportunities.

However, this could inadvertently hinder personalized education and learning plans, which are tailored to meet individual students' current status and educational needs. The implications for personalized AI learning programs and AI tutors remain to be seen, as navigating these complexities could prove challenging. Amendment 718 is potentially less contentious, focusing on the reliability of AI systems used to monitor student behavior, particularly regarding writing. Concerns about students using generative AI to inappropriately complete assignments are prevalent in educational settings, leading to significant investments in AI technologies aimed at detecting such misconduct. For instance, Turnitin's AI writing detection system is at the forefront of identifying instances where students submit AI-generated content as their own.

While these amendments seek to address discriminatory admissions processes, personalized learning plans, and the use of AI to monitor student behavior during assessments, they also raise critical questions about the potential constraints on personalized learning and the efficacy of AI-driven educational tools (Jadek, 2024). Overall, the EU AI law is expected to have a significant impact on AI in education, requiring educational institutions to monitor and adapt to the regulatory landscape. However, it also provides an opportunity for collaboration between educators and policymakers to create effective policies that support learning while ensuring the responsible use of AI.

3.3. The emergence of a new era in plagiarism: Endeavors to propose legal reforms

One such act that violates rules and ethics is plagiarism. According to the theory of deontology, which believes that humans have basic rights that must be respected when making decisions (Granitz and Loewy, 2007). In addition, plagiarism can be defined as an unethical act where the perpetrator steals and displays the work of others so that it is considered as their own (Granitz and Loewy, 2007). Hence, based on the theory of utilitarianism, an individual should make decisions that provide the greatest utility and consider costs versus benefits (Granitz and Loewy, 2007). People who subscribe to this theory can justify plagiarism if it has a good purpose and outcome (Granitz and Loewy, 2007).

The global awareness of the importance of progressive legal policies in resolving issues of plagiarism and the originality of scientific research caused by the use of AI has indeed been observed. Unfortunately, in Indonesia itself, there is no law that specifically regulates the existence of AI, especially in the context of its utilization in the process of writing scientific papers. Upon reflection of legal arrangements in several other countries, it can be seen that AI in the field of education has been regulated in certain legal instruments and/or through academic or research guidelines. Although the regulation is not particularly detailed or comprehensive, it must be interpreted as a responsive and progressive action in light of the evolving legal landscape in the field of education. For example, the United States, one of those states, California, has compiled The Assembly of Senate Bill 892 (2024): California Artificial Intelligence Research Hub which will later become a reference in dealing with the issue of plagiarism in scientific writing. Meanwhile, Singapore as one of the countries in the Southeast Asia region has also established a guideline that is the basis of reference for universities in solving the problem of plagiarism. The guidelines are set directly by the Singapore Minister of Education.

Then in the European region, the development of AI regulation was so progressive that it gave birth to an international legal instrument called the Artificial Intelligence Act (“EU AI Act”). Through this legal instruments, European member states are basically expected to take strategic steps by establishing a regulatory framework that can oversee the use of AI in the field of education, both covering the reliability of the system and the aspects of respect and protection of other parties’ copyrighted works. Looking at the implementation of the process of checking scientific writing in the world, the actual use of several software or media or applications that can detect plagiarism by AI has been used. For example, the use of Turnitin and Copyscape applications/software.

In Indonesia, Turnitin is widely use by universities to check for plagiarism (Aravik and Tohir, 2023). However, what needs to be understood is that the check only focuses on "plagiarism with existing works and does not check for compatibility with AI involvement". Therefore, in the event that there is a scientific writing process carried out with the help of AI and AI does not cite sources that actually belong to others, there is a possibility that it will not be detected. Another worst-case scenario is “scientific research that is directly created by AI based on the orders of the author as a service user”.

This is exacerbated by the absence of legal instruments from the Government that can be used as a reference by universities in determining standards for checking originality, including seeing the extent of the use of AI in the process of writing a scientific work with adequate software standards. The paradigm that needs to be owned in looking at the central issue of AI in the field of education in the world is that even though there is a legal construction in a country that allows someone who misuses AI for scientific writing to be sued for compensation (related to copyrighted works) or punished, it is wise to focus on the preventive aspect of legal development by closing the possibility of such misuse occurring with an administrative law improvement approach. Through planning and building a system and adequate procedures in the process of preparing and publishing scientific papers. As the legal adage reads "Gouverner C'est Prévoir (which means running the government is looking ahead and planning what will or should be done)" (Boston, 2016). So to solve the problem of originality of written works in Indonesia due to the involvement of AI, there are at least two schemes that can be applied, namely short-term schemes and long-term schemes.

3.3.1. Short-term scheme

Considering the characteristics of the Indonesian state which adheres to a civil law system with tiered regulations, the absence of a legal instruments at the level of a law regulating AI in the context of plagiarism in scientific papers certainly creates a vacuum of norm. It needs to be observed together that the process of forming and/or revising a law in Indonesia is carried out through a political process between the legislative and executive branches of power through quite long stages, namely the stages of planning, preparation, discussion, ratification and enactment as formally regulated in Law Number 18 of 2014 concerning the People's Consultative Assembly, the House of Representatives, the Regional Representatives Council, and the Regional Representatives Council as amended into Number 13 of 2019 Third Amendment to Law Number 17 of 2014 concerning the People's Consultative Assembly, the House of Representatives, the Regional Representatives Council, and the Regional Representatives Council jo. Law Number 12 of 2011 on the Establishment of Legislation as amended into Law Number 13 of 2022 on the Second Amendment to Law Number 12 of 2011 on the Establishment of Legislation.

Therefore, the short-term solution that can be implemented in Indonesia should be to revise Ministerial Regulation 39/2021 by adding provisions regarding the use of AI in the process of writing scientific papers with the following main points of regulation:

1) *Definition of AI Utilization in Scientific Writing;*
2) *Limitations of the Allowable Use of AI;*
3) *Forms of AI misuse in the Scientific Writing Process;*
4) *Academic sanctions for misuse of AI; and*
5) *The University's obligation to further regulate the technical matters of its implementation (including standard monitoring procedures, adaptation of arrangements and the process of checking scientific papers).*

Furthermore, separately to ensure that all universities in Indonesia actually implement the Ministerial Regulation in a measurable and integrated manner, the

Minister of Research, Technology and Higher Education can issue a Circular Letter on Procedures for Checking and Monitoring the Originality of Scientific Writing which contains implementation instructions for all Rectors to utilize Turnitin software or the like not only in checking plagiarism of other previously existing works but also upgrading the software to check the percentage of AI involvement in scientific writing. Then with the Ministerial Regulation that has been determined and the Circular Letter that has been circulated to all Universities, the University Leaders follow up on these provisions by revising the University Chancellor's Regulations on Academic Standards and Guidelines for Scientific Writing by regulating the checking procedures for each scientific research in accordance with the Ministerial Regulations and Circular Letters that have been determined.

3.3.2. Long-term scheme (ideally)

The difference between the short-term and long-term schemes is actually only in the process of establishing and revising the law that needs to be done first before establishing a Ministerial Regulation governing AI. This effort is more directed towards the nation's efforts in harmonizing the relevant laws and regulations. Concretely, this long-term scheme will require the Government to first enact an Artificial Intelligence Law ("AI Law") as the lex generalis of other laws that regulate AI in certain fields. With this AI Law, all laws that previously intersect with the existence of AI must first be harmonized in terms of concept, definition, and scope in order to realize the values of legal certainty in its application.

As a lex specialis of the AI Law, Law 20/2003 needs to be revised by adding provisions related to AI involvement in education, especially related to the concept, definitions and instructions to the implementers of the Law to regulate other technical matters through an Implementing Regulation. After that, further arrangements will be made as described in the previous section of the short-term scheme. To make it easier to understand the ideal concept of legal reform (long-term) proposed to be implemented in Indonesia, it is described in the following chart in **Figure 2**:

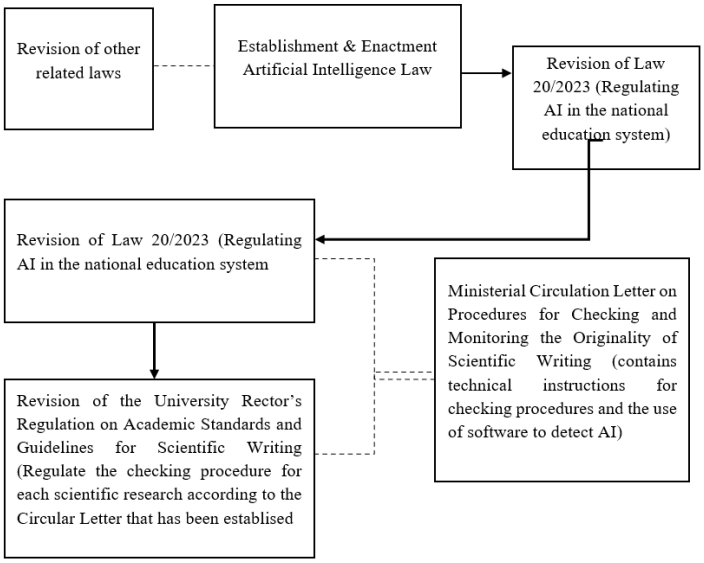

Figure 2. Proposed ideal concept of law reform (long term).

4. Conclusion

The presence of AI Chatbot in the education system not only provides easily accessible information services, but also has a negative impact, especially the increase in plagiarism in the preparation of scientific papers. In Indonesia, in terms of regulating the involvement of AI in the process of preparing scientific papers, it is still not regulated, especially those that lead to or fulfill the elements of an act of plagiarism. On the other hand, countries such as the United States, Singapore, and the European Union already have rules governing the involvement of AI in their education system. Therefore, efforts are needed to establish regulations on the involvement of AI in the education system in Indonesia, so as to be able to prevent plagiarism in the writing of scientific articles whether regulated in Ministerial regulations, regulations in the university environment, to the formation of special laws regarding AI.

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