

## **Artificial Intelligence and Ethics in the Classroom: A Systematic Review**

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### **Abstract**

*This systematic review study mapped the scientific literature produced in the last five years —2018-2023— around the need to identify the ethical implications generated by the implementation of AI in classroom practices. The databases where the search was carried out were Scopus and Semantic Scholar. Among the findings, it was found that there is little research production that provides data in this regard, evidencing a deep conceptual and theoretical void on the subject. Therefore, there is a need for teachers to reflect and criticize the challenges generated by these new technologies in the world's educational systems and begin, through field research, to document how AI implemented in the processes of teaching-learning the current moral axioms are developed.*

**Keywords:** *Artificial Intelligence, Education and Ethics.*

### **Introduction**

The irruption of Artificial Intelligence (AI) in practically all human activities has provoked a number of reactions, many of them dissimilar, contradictory or motivated by the passions created by the excitement of the technology of the moment. As for the ethical reflection of the matter, opinions have not been long in coming. Thus, for example, Tahaei et al. (2023) in their documentary review manage to map at least 164 research articles or conferences related to the subject. This shows an exponential growth in the repercussions generated by AI on sensitive issues such as: governance, equity, applicability, human development, privacy and security.

However, as some have suggested (Stahl, 2022), it seems that ethical discussions around AI have mostly revolved around the legal aspects of AI, its impact on human rights, and how countries should legislate on its implementation (Bernd et al. 2020). However, there has also been considerable interest in the implications of AI in educational practices and the potential it could bring to reduce the learning gaps that phenomena such as COVID-19 have deepened (UNESCO, 2020; UNESCO, 2019).

However, most academic production in this regard has been purely theoretical, with few classroom experiences documenting the ethical implications of the use of AI in teaching practices. In the words of Holmes et al. (2018):

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Around the world, virtually no research has been conducted, no guidelines agreed, no policies formulated, and no regulations enacted to address the specific ethical issues raised by the use of artificial intelligence in education. (p. 552)

Therefore, this systematic review research carried out a critical analysis of the existing literature on the subject, in order to indicate what is known about it; but, above all, the weaknesses and inconsistencies that persist. In this sense, the question that was tried to answer was: How have the ethical issues been addressed in relation to the inclusion of artificial intelligence in educational practices? This article has concluded that the information available today does not allow definitive answers to be given on the matter.

## Methodology.

The research design was qualitative, with a systematic review approach. It is understood, according to García (2022), that its purpose is "to identify what is known, but, above all, what is unknown about the field under investigation." (p. 1). For this, the type of analysis of the literature was critical, since it was intended to reveal the weaknesses, contradictions, controversies or inconsistencies (Paré et al. 2015) of the works consulted in relation to the ethical issues raised by the inclusion of artificial intelligence in educational practices.

However, the search protocol that determined the phases for the literature review was, according to the typification of Grant and Booth (2009), the SALSA framework. It owes its name to the four main steps that frame the review process, namely, Search, Appraisal, Synthesis, and Analysis — (search, evaluate, synthesize, and analyze). In order to answer the research question: RQ1, how have the ethical issues been addressed in relation to the inclusion of artificial intelligence in educational practices?; The following question was posed as a question for the mapping of bibliographic production: MQ1, how many and what types of scientific studies have been published in the last five years in relation to the ethical issues raised by the inclusion of artificial intelligence in educational practices?

Linking all of the above, the following table simplifies how the study of the literature, according to the SALSA framework, methodologically allowed to determine the findings and answer the research question. Of course, attending to the question that guided the mapping of the production of bibliography around the analysis of the ethical issues that the inclusion of artificial intelligence in educational practices has raised.

Table 1. Literature review process.

RQ1: How have the ethical issues been addressed in relation to the inclusion of artificial intelligence in educational practices?	
MQ1: How many and what types of scientific studies have been published in the last five years in relation to the ethical issues raised by the inclusion of artificial intelligence in educational practices?	
Search	Primary sources were searched in the Scopus and Semantic Scholar databases. The keywords recorded were: Artificial Intelligence, Education and Ethics in a time range of the last 5 years —from 2019 to 2023—. The results showed the existence of 13 publications in Semantic Scholar; while in Scopus of only 1. Likewise, the check-up indicated that it has been since 2020 where there has been a greater volume of scientific production in the field.
Evaluation	The evaluation of the primary sources initially collected was defined by quality criteria. These were: research articles, documented findings in the classroom implementation of AI and its ethical reflection. In this, the search yielded only three publications that record significant experiences of the use and subsequent analysis of AI in classroom teaching practices (García et al. 2020; Rets et al. 2023; González & Lugo, 2020). It is noteworthy that two are in higher education and one in secondary education.
Synthesis	The information collected from the primary sources resulting from the evaluation was synthesized according to the criteria set out in the research question. In doing so, it highlights the following common elements. - All the experiences implemented AI related to learning analytics as the main tool for pedagogical intervention.

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-	All the experiences are developed within the framework of teaching in the exact sciences: chemistry, physics, engineering and computer science.
-	Only one of them, (Rets et al. 2023), explicitly elaborates on ethical issues and suggests recommendations in this regard. The rest present it in a marginal way, without making little mention of the subject.

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Analysis	The scientific literature resulting from the implementation of AI in classrooms with the subsequent reflection aroused by it is not abundant. In general, theoretical-conceptual recommendations and constructions predominate without little empirical support. This will be discussed in more detail in the results section.
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Source: Authors' own creation (2023).

## Results and Discussion.

AI, as a broad field of study, has been a common language among computer scientists for decades, that is, its emergence has not been *ipso facto*. However, efforts to implement it in the field of education; It generates uncertainties resulting from ignorance. It's not clear if and if this type of technology is actually capable of the task at hand; We are uncertain how and to what extent it is useful. Therefore, it is essential to determine to what extent what has been said about it is reality or exaggeration (UNESCO, 2021).

Now, one of the issues that AI has raised is the ethical implications that it would have in the daily use that humans give it. For this reason, Rahwan et al. (2019) propose the study of machine behavior in various domains and the integration of knowledge from different scientific disciplines. Therefore, pedagogical reflection on the implementation of AI in teaching and learning should not be summarized in the functionality or practical nature of classroom strategies. On the contrary, teachers must assess the extent to which students' individuality, identity, dignity, privacy, and free development can be violated by these technologies.

However, although there are studies that theorize about it (Flores, 2023; Lo Piano, 2020); there is little empirical information about the ethical implications of AI in teachers' classroom practices. However, research demonstrating the pragmatic use of this technology in teaching and learning processes is not unknown (Kavita, 2023; Hwang and Yun-Fang Tu, 2021). However, most of them are designed more to highlight the benefits, recommendations or challenges of AI in education systems or in specific subjects or themes: little or no analysis of the ethical implications or documentation of how this was developed in the field study.

With one exception, (Rets et al. 2023), where there is evidence of an explicit reflection on the subject once a field study has been carried out; Very little information is found on the subject. Other research may mention it circumstantially or marginally (García et al. 2020; González & Lugo, 2020); Clearly, it is not the main topic of interest. Therefore, the main finding of this systematic study of the literature has been to demonstrate the need to carry out empirical research that, based on the experience of classroom practices, manages to have relevant information to determine how ethical issues have been addressed in relation to the inclusion of artificial intelligence in educational practices.

For this reason, judging by the existing investigations, it is impossible to formulate an answer that would settle the matter. On the contrary, the study reveals the urgency of promoting inquiries that inquire into the need to get rid of prejudices, expectations fed by exaggerations or merely philosophical constructions; to answer the question based on real experiences resulting from the implementation in the classroom. Given that, if AI has come to undermine ethical stances in pedagogical practices; This will only be verifiable in everyday matters where teachers and students manage to demonstrate it.

Ethics, as a field of study, enjoys a venerable tradition. Its philosophical postulates have been present in each of the times when the ground of safety begins to shake and circumstances are being overtaken by stormy changes. The disruptive appearance of AI in

all scenarios of human daily life is perhaps one of those moments when reflection and new moral axioms are needed to help understand people's behavior: now, responsibility is shared with machines. Hence, categories like this are redefined (Tigard, 2021).

In this sense, there are many scenarios where progress is beginning to be made. For example, there have been warnings about the military use of AI (Boulanin & Brockmann, 2020), also in medicine there have been important contributions (Santos, 2022) or its consequences on jobs (Deranty and Corbin, 2022) and the positions that companies and designers should assume (Lauer, 2021). Likewise, research has pointed out how delicate it is to interact with this type of technology to establish moral judgments or criteria, it is known with certainty that ChatGPT frequently suggests contradictory ethical positions or behaviors in the face of the same facts and without any knowledge of the facts, the delicate thing about the matter is that it influences users (Krügel, 2023). However, humans are more likely to adhere to immoral instructions from humans than from robot supervisors (Lanz, 2023).

However, it is also necessary to reach consensus in a field as sensitive as education. The emergence of AI makes it necessary to evaluate and reconstruct countries' school curricula according to criteria of quality, relevance, contextualization and without exaggerating the potential benefits that these technologies would bring to pedagogical practices. To this end, there are important suggestions (Association for the Advancement of Artificial Intelligence —AAAI—2018; Holmes et al. 2018; UNESCO, 2021; UNESCO, 2023) that indicate the lines of action for the actors in charge of designing public policies in education.

It is equally valuable to understand the complexity of the topic and to price AI-designed tools according to a taxonomy that allows the purposes of each of them to be clearly determined. Given that not all of them respond to the same objectives: some are focused on helping students learn, others on facilitating teaching work, and others aimed at completing and processing administrative activities of institutions (Holmes & Tuomi 2022). This is necessary because each actor, depending on the role they play, tends to value and have different opinions or perspectives on the issue (Holmes et al. 2023a).

However, despite the fact that there are, as indicated, several significant experiences documenting the implementation of AI in different scenarios and levels of school education (Kavita, 2023; Hwang and Yun-Fang Tu, 2021; Dogan et al. 2023); Few people ask themselves about the ethical aspects that flow from this. Therefore, it is imperative to seek field studies that, based on empirical implementations in the classroom, begin to establish the way in which students and teachers are treated or, in other words, whether the ethical assumptions attached to all individuals are fully respected.

In this regard, the research carried out here found that there is a lack of scientific literature on the subject. There is not enough information to provide conclusive answers to this urgent and sensitive issue. Unlike other scenarios where important case studies are evidenced that contrast ethical aspects in tune with the use or implementation of AI (Stahl et al, 2023); In the field of education, they are not abundant. This is a worrying gap to the extent that the literature has been reporting the serious cases where it has been proven how this technology has been violating or transforming what were thought to be solid moral or human rights axioms (De Asís, 2020) and before which pedagogy maintains an unbearable silence, perhaps, product of bewilderment or ignorance of the subject.

However, it is important to highlight how many governments around the world, international organizations, country unions, among other organizations have been pointing out the urgency of regulating and providing guidelines that help establish the pedagogical, curricular and ethical criteria that should be taken into consideration when integrating AI into the educational systems of nations (Holmes et al, 2022a; UNICEF, 2021; UNESCO, 2019). In addition, ethical reflections have provided important questions whose answers will be of vital importance to develop in the near future. For propaedeutic

purposes and based on the suggestions made by Holmes et al (2022b), this research proposes that programmers, teachers, students, educational administrators and public policy makers consider the following concerns and find possible answers in empirical classroom practices:

- How does the transient nature of students' goals, interests, and emotions impact the ethics of AI in education?
- How can students give genuinely informed consent for their participation in AI tools in education?
- What are the ethical obligations of the inclusion of AI in education of private organizations (developers of AI products in education) and authorities (schools and universities involved in AI in education research)?
- How might schools, students, and teachers question the way large volumes and datasets are being collected from them?
- What are the ethical implications of not being able to easily interrogate how some important decisions are made in AI technologies applied to education (e.g., those that use multilevel neural networks)?
- What are the ethical consequences of encouraging students to work independently with AI-enabled software (rather than with teachers or in collaborative groups)?

In addition, the discussion should not underestimate the abundant literature that has suggested an important frame of reference of ethical principles that allow us to direct our gaze towards the evaluation of teaching practices in classrooms when implementing AI in teaching and learning processes. Therefore, as summarized by Nguyen et al (2023), it would be important for future field research to consider the following table as a comparison criterion to develop conclusions that allow the first answers to the questions posed here.

Table 2. Ethical principles of AI in education.

Ethical principles for the integration of AI in education.	Codes	Definition
Governance and administration.	Governance and administration. Multi-stakeholder Interdisciplinary planning. International cooperation. Monitoring and evaluation.	It principle declares and manages how AI should be employed in education and the relevant mechanisms to ensure compatibility between the role of the technology being implemented and its designed purposes, to optimize the needs and benefits of education stakeholders. In addition, they must carefully take into account interdisciplinary and multi-stakeholder perspectives, as well as all ethical considerations of relevant domains, including but not limited to data ethics, learning analytics ethics, computational ethics, human ethics. rights and inclusion.
Transparency and accountability.	Transparency. Explainability. Responsibility Auditability.	The principle of transparency in data and algorithms holds that the process of collecting, analyzing, and presenting data should be transparent, with informed consent, and clarity about the ownership of the data, its accessibility, and the purposes of how the data will be used. AI algorithms must be explainable and justifiable for specific educational purposes.
Sustainability and proportionality.	Sustainability. Environment. Local alignment. Proportionality. Labour economics. Lifelong learning.	The principle of sustainability and proportionality states that AI resources applied to education should be designed, developed and used in a justifiable way that does not disrupt the environment, the global economy and society, such as the labour market, culture and politics.
Privacy.	Data Privacy.	The principle of privacy of AI resources applied to

	Children's Privacy.	education should ensure the informed consent of the user and maintain the confidentiality of users' information, both when they provide information and when the system collects information about them.
Safety.	Governance data.	The principle of security of educational resources applied to education must be designed and implemented in a way that ensures that the solution is robust enough to effectively safeguard and protect data against cybercrime, data breaches, and threats of corruption, ensuring the privacy and security of sensitive information.
	Safety.	
	Robustness.	
	Damage prevention.	
Inclusiveness.	Safety.	The principle of inclusion in accessibility in the design, development and deployment of AI resources applied to education should take into account infrastructure, equipment, skills and social acceptance that will be adapted to a wide range of people in the intended region, allowing equitable access and use.
	Accessibility	
	Diversity.	
	Data Integrity.	
	Non-discriminatory data.	
	Algorithm bias.	
	Justice	
Gender equality.		
AI integrated into education that is human-centric	Inclusiveness.	The goal of this principle should be that AI resources applied to education should complement and enhance human cognitive, social, and cultural capabilities, while preserving meaningful opportunities for freedom of choice, ensuring human control over AI-based work processes.
	Human supervision.	
	Human-centered.	
	Human rights.	
	Human dignity.	
	Human agency (students).	
	Autonomy human.	
Role of the teacher.		

Source: Nguyen et al (2023).

Summing up, given the scarcity of fieldwork that provides ethical guidance after implementing AI as an educational resource, some concerns arise: is it because the topic is not relevant to researchers? Or do we still not have the conceptual and theoretical tools that provide the categorical horizon for analysis? Or perhaps the expectations generated by the new technology have not yet aroused enough suspicions of how dangerous it would become without adequate ethical control? In any case, this paper points out the gaps that exist in this regard and suggests some guidelines that could be useful for future empirical studies.

Likewise, it highlights the need for educational practice to begin to produce these studies: teachers are the main ones called upon to take matters into their own hands. Since, following Holmes et al (2023b), it could be left to others—computer scientists, AI engineers, or large tech companies—to take control of the situation; However, this alternative would be to close the doors to a productive dialogue where criticism and reflection are the main hallmarks.

## Conclusions.

This study, with a systematic review approach, mapped the scientific literature produced in the last five years in order to identify the ethical implications generated by the implementation of AI in classroom practices. In this, he found that there is a lack of sufficient research on the matter. There is little information that would allow conclusive answers to be given to such an urgent and delicate issue. Unlike other scenarios, where important case studies are evidenced that contrast the ethical aspects in tune with the use or implementation of AI (Stahl et al, 2023); In the field of education, they are not abundant. This is a worrying gap to the extent that the literature has been reporting the serious cases where it has been proven how this technology has been violating or

transforming what were thought to be solid moral or human rights axioms (De Asís, 2020) and before which pedagogy maintains an unbearable silence, perhaps, product of bewilderment or ignorance of the subject.

However, it is important to highlight how many governments around the world, international organizations, country unions, among other organizations have been pointing out the urgency of regulating and providing guidelines that help establish the pedagogical, curricular and ethical criteria that should be taken into consideration when integrating AI into the educational systems of nations (Holmes et al, 2022a; UNICEF, 2021; UNESCO, 2019). Likewise, it highlights the need for educational practice to begin to produce these studies and for teachers to be the main protagonists of them.

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