

# ARTIFICIAL INTELLIGENCE IN SCHOOL CLASSROOMS. ANXIETY AND ACADEMIC TENSIONS OF UNIVERSITY PROFESSORS

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acceptance date: November 12, 2022; Publication date: December 13, 2022

## Abstract

*This paper is aimed at understanding the concerns and perspectives of university teachers regarding the arrival of generative artificial intelligence in school classrooms and its impact on the design of learning environments. To this end, an inductive research method has been implemented that allowed establish some patterns and trends, for which a survey was used as a research instrument applying the likert scale, aimed at collecting the views and academic anxieties of the teachers surveyed in relation to the arrival of generative artificial intelligence to the educational sector. The results show that there are several strengths that teachers point out with the use of artificial intelligence in education, such as personalization of learning, promotion of autonomous learning, access to unlimited information, use of predictive patterns, simulation of scenarios, among others. other benefits; However, some disadvantages prevail, such as the difficulty in identifying plagiarism in the delivery of students' assignments, the technological asymmetries associated with the scarce technological endowment that limits in some territories from taking advantage of the opportunities provided by artificial intelligence, the misuse of time, the biases in the algorithms, among other difficulties, which is why greater qualification in this emerging technology for teachers is projected as a need, in addition, the adoption of new teaching bets by teachers that allow them to take advantage of the potential that Generative artificial intelligence can bring students into the design of learning environments and evaluation processes within the framework of artificial intelligence.*

**Keywords:** *learning environments, teacher, didactics, generative artificial intelligence, emerging technologies.*

## INTRODUCTION

The recent incorporation of generative artificial intelligence has sparked debates and academic reflections that seek to evaluate the role of this emerging technology in educational environments. In this context, it can be mentioned that this writing is a result of the development of the research project that is being developed and is called "Pedagogies, Didactics and Technologies: A triad for the configuration of innovative learning environments", aimed at contributing to an academic reflection on the challenges that teachers face with the introduction of artificial intelligence to the university classroom. Furthermore, the text reveals the main challenges and benefits that this type of emerging

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technology can contribute to didactic planning and the design of innovative and disruptive learning environments.

Throughout the text, some references associated with emerging technologies are presented, then the theoretical scaffolding around artificial intelligence in education is installed, which allowed us to highlight the impacts that it has been generating with its arrival in learning environments and opportunities it offers as an allied technology in the teaching and learning processes.

The idea of this writing is to contribute to the global reflection that has been brought about by the arrival of generative artificial intelligence to the paths of education and to promote research initiatives that contribute to the discovery of the multiple benefits that it can bring to teacher performance and pedagogical practice.

### **Theoretical approach**

Currently, there are different types of emerging technologies that focus on the automation and efficiency of processes, which has led to multiple activities carried out by humans being supported by this type of resources. Thus, from the context educational it is pertinent to analyze the impact that generative artificial intelligence as an emerging technology is generating in school classrooms. According to the approaches of Adell & Castañeda (2012), emerging technologies are “those technologies that are still little disseminated and used, whose impact in different areas is incipient but that generate great expectations” (p. 15). From this perspective, one of the emerging technologies that is generating academic controversy is Artificial Intelligence, which is conceived as one that imitates human intelligence processes using computer systems, algorithms and the management of data networks. However, generative artificial intelligence has derived from it, which through predictive patterns is capable of creating new content, which goes beyond the simple recognition or classification of data. Moreno (2019) suggests recognizing that “artificial intelligence today is also being part of the educational teaching-learning processes and generating new tools in which traditional educational processes are being reinvented and redefined thanks to the operational capacity of AI” (p.3).

Furthermore, Aparicio (2023) alludes that “the combination of AI and education has opened a range of possibilities to improve the way we teach and learn” (p1). In this sense, it is important to discuss how to integrate artificial intelligence into contemporary learning environments, understanding these scenarios as a system of intentions and components that interact with each other to enable a learning experience; Among them, you must think about space, time, resources, role of the teacher, role of the student, methodology, pedagogical perspective, feedback, evaluation, among other elements. These types of environments are also usually recognized in academic literature as “educational environments”, which, based on the postulates of Bravo et al., (2018), are defined as a “physical and theoretical environment structured and designed specifically to adapt to the needs of learning and the diverse characteristics of the students” (p.2).

Likewise, Jiménez (2020) proposes a critical integration of emerging technologies in teacher training from a look toward the future; Therefore, it suggests that students have an active and leading role in their learning process, for which it is required that they question their current pedagogical practices and contribute to the joint construction of an educational horizon that is oriented to “explore strategies to mitigate the access gaps and improve inclusion, develop more robust ethical frameworks to guide its application and study the long-term impact of automation on employment and society” (Montalván, et al., 2024, p.179). For this reason, it emphasizes the importance of effectively integrating emerging technologies into school settings, privileging experimentation and active participation.

Likewise, Márquez (2021) explains how emerging technologies have transformed the teaching-learning process and the challenges facing higher education in Colombia. Furthermore, this study highlights the importance of virtual and distance education, as well as the advantages and



disadvantages of its use in education. The new pedagogies and methodologies that arise in new learning environments are mentioned, and techno-education is discussed as a consequence of the implementation of ICT in education. Higher education and the business sector are important in assuming the new challenges posed by technology in the way of transmitting knowledge.

In the same way, Losano (2023) conceives that artificial intelligence “opens the possibility that humanity can look at other phenomena, delve into its most complex problems and recognize its particularities in context” (p.4). From this perspective, it can be conceived that the use of generative artificial intelligence in teaching and learning processes must overcome the instrumental dimension and open up other creative, dynamic and disruptive ways of teaching and learning; that enrich learning environments and experiences, although to do so, it is essential that teachers develop expertise in the use of this technology. Furthermore, it is necessary to encourage an ethical culture of its use in teachers and students so as not to transgress the scope of this technological tool.

Without a doubt, examining some theoretical frameworks contributed to understanding the scope that this emerging technology is having, trying to gather the experience of higher education teachers in relation to the integration of artificial intelligence in school classrooms. In this sense, it was possible to identify various experiences associated with the use of generative artificial intelligence that allude to the different applications that it offers, such as image generation, natural language processing, music creation, product design, among others; It has also been indicated that it is a field that continues to evolve and has demonstrated significant advances in the creation of artificial content that increasingly resembles human creations.

It should be noted that the arrival of AI strains the design of current learning environments and invokes the need to constantly reevaluate and reconfigure learning spaces, understanding their relevance in the comprehensive training of subjects, since they are essential in the processes of learning. teaching and learning given its influence on the development of knowledge, skills and values in students. Also, it is important to take into account the diversity of elements that can be incorporated into these environments, such as entertainment, culture, technology, among other resources that allow the learning environments to be conditioned in light of the interests of those involved.

#### METHODOLOGY

The methodological approach was carried out from an inductive method, applying the content analysis technique. It should be noted that this type of methods are based on the direct observation of specific phenomena, data or experiences to build general conclusions or theories that motivate the generation of knowledge and a broader and more complex understanding of the object of study (Moscoso, 2017, p .635). For this, a scientific literature review matrix was used and a survey was applied to 30 university professors, from where the interpretation of the collected data was carried out that facilitated “understanding the meaning of social reality from the perspective of the participants” (Santaella , 2006, p.161).

The survey was structured into 13 questions, open and closed, using the Likert scale and provided input to address the research question: What are the academic anxieties and concerns of generative artificial intelligence in the university school classroom?

For the interpretative scope, the content analysis technique was implemented, through which open coding was carried out on the selected documentary corpus and on the open questions of the applied instrument. For this, the specialized data analysis software Nvivo was used, which facilitated the organization, classification and interpretation of the results obtained. This analysis allowed us to detect patterns that were interpreted to give them meaning in perspective of the objectives of this study.



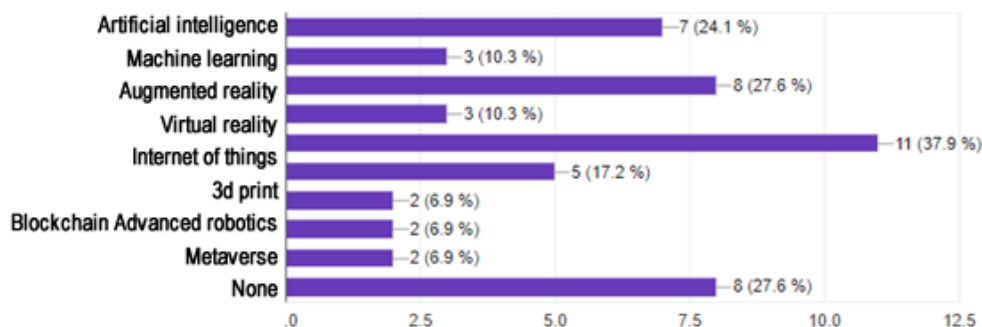
**RESULTS AND DISCUSSION**

**The arrival of Generative Artificial Intelligence in school settings**

Emerging technologies have become an increasingly valuable resource in education, including artificial intelligence, virtual and augmented reality, the internet of things, robotics, mobile learning and online platforms. that offer new opportunities for learning and teaching. These technologies have been characterized by improving accessibility processes, interactivity and personalization of learning, and allowing students to learn at their own time and pace. Additionally, emerging technologies can improve collaboration and communication between students and educators, and foster the creation of online learning communities. Without a doubt, “technological innovation represented in its multiple forms is a reality that is here to stay, so it must be conceived as an opportunity to transform education in educational centers and invent new scenarios in which students strengthen their cognitive abilities.” ” (Octavio & Garrido, 2024, p.4).

The following figure shows the preferences for the use of emerging technologies used by the group of teachers surveyed.

**Figure 1. Which of the following emerging technologies do you use to develop your learning environments?**



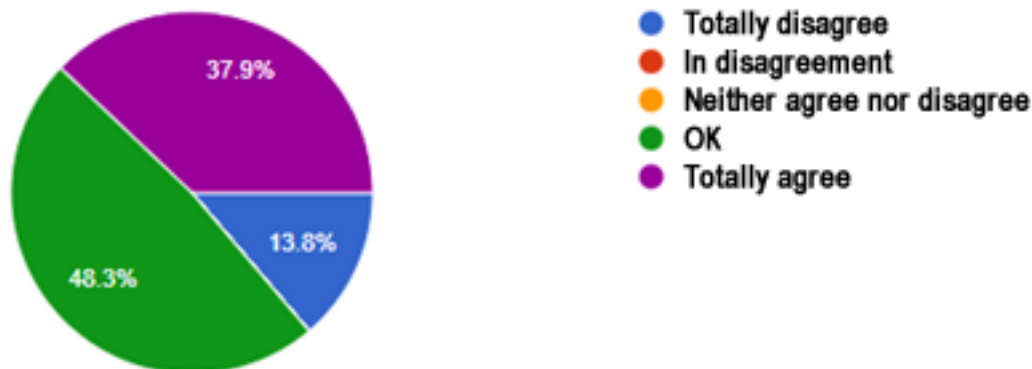
*Note.* Own elaboration.

It should be noted that in the previous question, teachers could mark several answers, so this result reflects that one of the emerging technologies that teachers use the most is the Internet of Things with 37.9%, followed by augmented reality. with 27.6% and in third place artificial intelligence with 24.1%. However, it is observed that 27.6% state that they do not use any of these technologies. The previous results allow us to point out that for some teachers, the topic of artificial intelligence within the configuration of their learning environments is a new topic, so it is the opportunity to continue expanding and exploring this academic debate that comes to disrupt a little didactic strategies in teaching practice.

On the other hand, with the instrument applied, it was observed that the teaching practices that are being presented with the arrival of artificial intelligence lead to finding teachers who are challenged in the actions they must take in the face of these new realities and doubts arise such as: What are the main challenges and opportunities that artificial intelligence has brought about in the classroom? How can teachers use AI-based learning to adapt their teaching methods to students' needs? and What is the impact of artificial intelligence on personalizing learning for each student? In the following figure you can see the teachers' appreciation.



**Figure 2. Do you consider that the arrival of artificial intelligence as an emerging technology becomes a challenge for teachers in the classroom?**



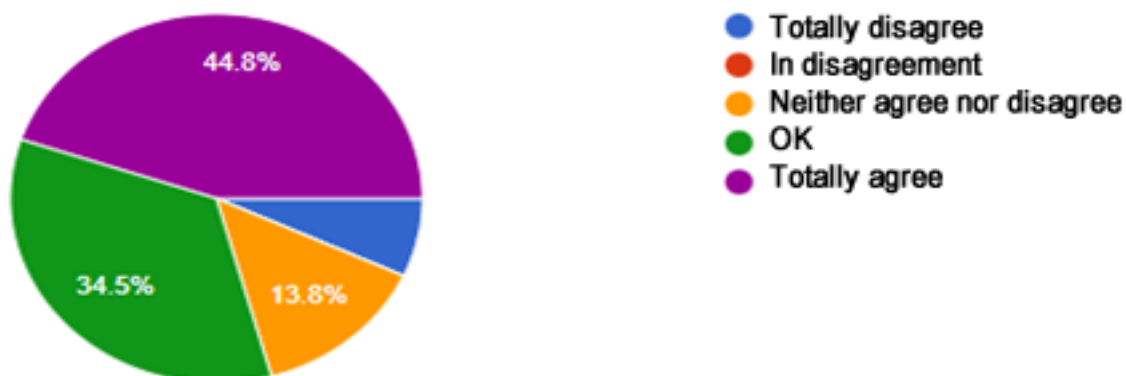
Note. Own elaboration.

In harmony with the questions raised and what the instrument revealed, it can be seen in the previous figure that 86% of teachers recognize that the arrival of artificial intelligence has become a challenge in the classroom. Likewise, the reviewed literature raises a series of complex challenges with this emerging technology, especially at the ethical, human rights and security levels. (Peña et al., 2020, p.4). Also, it is insisted that artificial intelligence “has the potential to disrupt the lifestyles of civilization in general in many ways, even altering the condition” (Arbeláez et al., 2021, p1).

Something similar was reported by the instrument applied, which revealed the concern among teachers about the ethical and responsible use of artificial intelligence. In this regard, more than 90% of the teachers surveyed expressed this concern, which translates into the absence of tools and mechanisms to verify and control the content generated by artificial intelligence, limiting the classroom evaluation processes and the certainty of the creations presented by the students in light of the works requested by the teacher.

On the other hand, as seen in the following figure, more than 80% of teachers surveyed recognize the need to reinvent their teaching methods in light of the challenges and possibilities that artificial intelligence is generating in education.

**Figure 3. Do you think that the incorporation of artificial intelligence in education will require teachers to adapt their teaching methods?**



Note. Own elaboration.



Without a doubt, emerging technologies have become an increasingly valuable resource in education, however, it is important to mention that in addition to artificial intelligence there are other technologies such as virtual and augmented reality, the internet of things, learning mobile, online platforms, among others, which offer new opportunities for learning and teaching. These technologies have been characterized by improving processes of accessibility, interactivity, personalization of learning, and also allowing students to learn at their own time and pace. In this sense, it is important to begin to generate more disruptive learning environments based on students' ways of learning and the arrival of new technological tools.

Indeed, the constant appearance of new assumptions about the advent of artificial intelligence in education has become common, which puts into tension the capacity for action and scope of this emerging technology in the teaching and learning processes, which is why it is The increase in academic seminars that have emerged around Artificial Intelligence and education is evident, since there is a collective concern in the academic sector about how to establish a roadmap that allows taking advantage of the benefits of artificial intelligence in teaching and learning and pertinently consider the ethical challenges it entails. It should be noted that not only the changes or alterations occur in the educational sector, but “in other fields, this has reduced the demand for workers who perform mundane tasks, has improved output standards and has allowed humanity to solve complicated tasks. health, logistics and security that require informed decision-making.” (Flores & García, 2023, p.40)

Also, 86.2% of teachers stated that they agreed or agreed that artificial intelligence can be a valuable tool for personalizing learning, which benefits students with different learning rhythms and styles. since “they can generate interactive questions, game-based learning activities and simulations that allow students to apply concepts practically.” (Aparicio, 2023, p.223); In addition, these new learning scenarios summon the curiosity and motivation of students, strengthening their commitment and understanding of the contents they explore, therefore, it is necessary to recognize the benefits that artificial intelligence is promoting such as virtual tutoring and automated feedback to through chatbots and algorithms that process natural language and facilitate so-called machine learning.

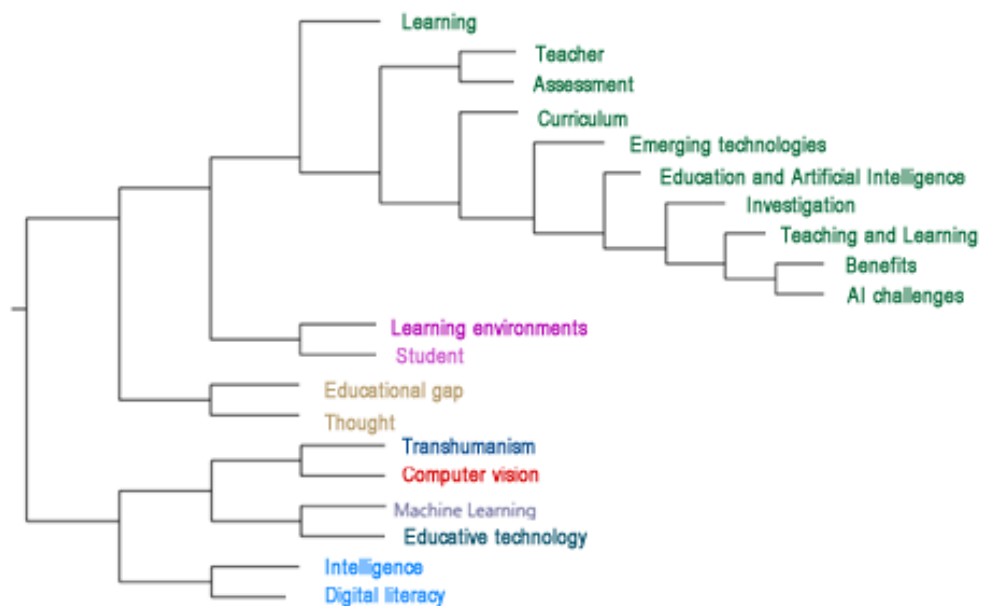
Without a doubt, artificial intelligence is impacting the personalization of educational processes, which facilitates the configuration of dynamic learning environments that welcome diverse individuality, since the power of algorithms contributes to “identifying the strengths and weaknesses of each student and design learning experiences that fit their pace and learning style.” (Ortega, 2023, p.3)

Also, it is important to mention that within the open coding that was carried out for the analysis of the reviewed literature, categories emerged that surround artificial intelligence in education. In the following figure you can see a diagram by clusters of the documents. reviewed where the close relationship between artificial intelligence and teaching, learning, the teacher, the student, evaluation, curriculum, educational technology, digital literacy is observed, all articulated with the creation of new bets that allow designing environments alternative and disruptive learning methods that encourage inclusion and diversity.





Figure 4. Map by clusters of emerging categories.



Note. Own elaboration.

On the other hand, it is noted that academic literature recognizes that emerging technologies can improve collaboration and communication between students and educators, and encourage the creation of online learning communities. However, Adell & Castañeda (2012) question the dichotomy between emerging technologies and pedagogies? pointing out that, emerging pedagogies are innovative pedagogical approaches that are based on the use of technologies and that seek to adapt to the needs and abilities of students in the digital age. These pedagogies are characterized by their flexibility and adaptability to changes in society, economy and culture, and seek to take advantage of the opportunities provided by emerging technologies to improve the quality of learning.

Concari (2014) also alludes to emerging technologies that are gradually being incorporated into education, highlighting the growing availability of free-use technological resources and the progressive access of students to them. In addition, some emerging technologies that may be useful for innovation in science teaching are described. In short, it is necessary to learn to use emerging technologies, to design didactic strategies in tune with the needs of the context, foresee the consequences and implications of their use and define actions for monitoring and evaluating them, "the importance of redefining the role of university professors and contemplate them not only as instructors, but as companions in the processes of creating resources and developing technological skills" (Puerto & Gutiérrez, 2022, p. 354).

### CONCLUSION

Generative artificial intelligence has come to impact different sectors, including education, causing tensions in the design and development of learning environments and the didactic configurations that teachers usually use to energize their teaching processes. Challenges associated with the digital divide, the ethical use of data, the security and privacy of user information, algorithmic biases, imprecision of content, low teaching qualifications, among other challenges are observed; However, also from the teaching perspectives and academic literature, benefits such as the personalization of learning, tutoring or automatic feedback, motivation, curiosity, the increase in educational resources and tools that facilitate the creation of content and assist the work of teachers in the classroom (Ocaña et al., 2019), in addition to other benefits that can be incorporated into the didactic planning of school processes. For this reason, a school is required that projects and imagines an innovative



educational future that integrates what the present is placing at its disposal, in this case, generative artificial intelligence.

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