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REVIEW

The impact of artificial intelligence on educational transformation

El impacto de la inteligencia artificial en la transformación educativa

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ABSTRACT

Introduction: education went through a profound transformation in the last decade, changing not only its structures and actors, but also pedagogical approaches. This evolution included the incorporation of digital technologies and artificial intelligence (AI), such as ChatGPT, which forced to rethink the role of teachers, the resources used and the objectives of teaching.
Development: during this process, tensions arose between those who quickly adopted these tools and those who resisted incorporating them. Authors such as Inés Dussel and Laura Marés pointed out the need to critically appropriate technology in order to form responsible digital citizens. AI, defined as a technology capable of performing tasks that require human intelligence, was presented as a resource with great potential, but also with challenges. ChatGPT stood out for its ability to generate automated text in response to queries, which particularly appealed to high school students. However, their responses could contain errors or outdated information. For this reason, teacher training was essential. Initiatives such as the INFoD sections and surveys by the Ministry of Education of the City of Buenos Aires revealed the growing interest and need for professional training in the ethical and pedagogical use of these tools.
Conclusion: the integration of AI in education required a redefinition of teaching competences. ChatGPT, far from being a threat, became an opportunity to innovate pedagogical practices, provided it was used in a critical and responsible way.

Keywords: Artificial Intelligence; ChatGPT; Teaching; Educational Technology; Teacher Training.

RESUMEN

Introducción: la educación atravesó una transformación profunda en la última década, modificando no solo sus estructuras y actores, sino también los enfoques pedagógicos. Esta evolución incluyó la incorporación de tecnologías digitales e inteligencia artificial (IA), como ChatGPT, lo que obligó a repensar el rol docente, los recursos utilizados y los objetivos de la enseñanza.
Desarrollo: durante este proceso, surgieron tensiones entre quienes adoptaron rápidamente estas herramientas y quienes se resistieron a incorporarlas. Autoras como Inés Dussel y Laura Marés señalaron la necesidad de apropiarse críticamente de la tecnología para formar ciudadanos digitales responsables. La IA, definida como una tecnología capaz de realizar tareas que requieren inteligencia humana, se presentó como un recurso con gran potencial, pero también con desafíos. El ChatGPT se destacó por su capacidad de generar textos automatizados en respuesta a consultas, lo cual atrajo especialmente a estudiantes del nivel medio. Sin embargo, sus respuestas podían contener errores o información desactualizada. Por ello, la capacitación docente resultó esencial. Iniciativas como los tramos del INFoD y relevamientos del Ministerio de Educación de la Ciudad de Buenos Aires revelaron el creciente interés y necesidad de formación profesional para un uso ético y pedagógico de estas herramientas.
Conclusión: la integración de la IA en la educación exigió redefinir las competencias docentes. ChatGPT, lejos de ser una amenaza, se convirtió en una oportunidad para innovar en las prácticas pedagógicas, siempre que

fuera utilizado de manera crítica y responsable.

Palabras clave: Inteligencia Artificial; ChatGPT; Docencia; Tecnología Educativa; Formación Docente.

INTRODUCTION

Education is undergoing a profound transformation that impacts both pedagogical practices and the very conception of teaching and learning.[1] Compared to the school of just a decade ago, the changes are evident and structural: not only have buildings, teachers, and students evolved, but also pedagogical approaches, which today integrate previously unthinkable elements, such as digital technologies and, more recently, artificial intelligence (AI).[2] This technological irruption poses a new educational scenario that requires rethinking the role of teachers, the resources used, and the objectives of training.

Inés Dussel points out that new technologies configure knowledge differently from that traditionally promoted by schools, which generates tensions between those who enthusiastically adopt these tools and those who are still reluctant to incorporate them. However, the current educational reality demands a critical review of these positions: educators cannot remain oblivious to the innovations that are already present in the classroom through the daily use of students. Laura Marés proposes that the challenge is to critically appropriate technology to form conscious digital citizens capable of interacting with these resources ethically and reflectively.

In this context, artificial intelligence appears as a tool with great potential whose incorporation requires a careful analysis of its advantages, limitations, and concrete applications. One of the most notorious developments in this field is the use of ChatGPT, an AI-based application that allows the generation of texts and answers based on user prompts. Its accessibility and versatility have quickly captured the interest of students, especially at the intermediate level, which directly challenges teachers about their knowledge, use, and regulation in school practices.

Faced with this new scenario, continuous training in the use of ICTs is essential, as stated in the Beijing Consensus on Artificial Intelligence and Education. This document highlights the need to redefine teaching competencies and strengthen professional training to meet current challenges. AI is not only a support tool but also a catalyst that can profoundly transform education provided it is incorporated with a critical, formative commitment to improving learning.

DEVELOPMENT

The school of 10 years ago, the school that everyone knew, is no longer what it is today. Not only have the building structures, the teachers, the teaching paradigms, and the students changed, but also the way of teaching and learning has mutated and been re-versioned. The transversality of new technologies in daily planning was once unthinkable, but today, it is already a reality.

As Inés Dussel rightly states, “The new technologies have logics and ways of configuring knowledge that is very different from those of the school”. Even so, a dichotomy arises when introducing them into the educational environment. Some teachers recognize that technology offers more and better resources for the classroom, while others resist incorporating technology into their teaching and learning plans. This is something that should no longer be considered at present. Educators, faced with the advances in technology and its use by students, cannot escape the necessary training to move forward together with the school and its students. In the words of Laura Marés, “It is proposed that each teacher appropriates the technologies for a critical use and to form full-fledged digital citizens”.

Following this line and taking into account the reality of education and virtuality, it is necessary to survey the latest developments in the scientific field of the Internet that can shape the teaching task. What can be evidenced and analyzed today is the use of Artificial Intelligence and all that it encompasses or generates, primarily within the classroom, and it is of great importance to understand its applicability.

The question is what we mean when we talk about Artificial Intelligence. Artificial Intelligence is the branch of computer science that focuses on creating systems and machines capable of performing tasks that require human intelligence, such as learning, decision-making, and problem-solving.[3] As Carlos Scolari explains, “Artificial intelligence is a powerful tool that will facilitate tasks, but it will also modify our way of thinking and perceiving the world”.[4] Unesco “affirms that the deployment of AI technologies in education can improve human capabilities”.[5]

Then, the challenge that teachers face today is the knowledge or lack of understanding of these new technological tools and how they can be applied in their planning. This is where the importance of constant training in ICTs comes into play, as established in the Beijing Consensus on Artificial Intelligence held at Unesco:

Review and dynamically define the roles of teachers and the competencies they need in the context of teacher policies, strengthen teacher training institutions, and develop appropriate capacity development programs to prepare teachers to work effectively in educational environments with a strong presence of artificial intelligence.[5]

There is an AI that is gaining ground within the educational field. It is a new application that is already being widely used by students, mainly at the middle level and is called ChatGPT. This chat provides students with the facility to find solution assignments quickly. It is within everyone's reach and can be rapidly downloaded and kept on their devices for consultation on any subject.

ChatGPT is a computer program based on artificial intelligence. It generates texts like a computer robot that chats. When you enter its page, you have to ask a question, and it will immediately provide an answer... it generates tailored responses:

1. To the context of the question
2. To the user's request
3. To the degree of training of your algorithms

Therefore, if two users ask the same question, they could have similar, but not identical, answers.[3]

The use of ChatGPT in education has great potential to enhance teaching and learning, and teachers can play a crucial role in its implementation and practical application. It can help save time and improve teaching efficiency; however, teachers must learn how to use this chat effectively, understand its limitations, and ensure that it does not replace live and direct interaction with students. It is to see this chat as a tool, as not everything you write is correct.

ChatGPT sometimes writes answers that sound plausible but incorrect or nonsensical. Solving this problem is challenging because, during RL training, there is currently no source of truth; training the model to be more cautious causes it to reject questions it can answer correctly; and supervised training cheats the model because the ideal answer depends on what the model knows, rather than what the human demonstrator knows.[6]

In any case, it is necessary to understand both the potential advantages of education and its potential weaknesses. One of the disadvantages is that, although the chat answers definition and concept questions, it is not capable of skillfully answering problem-solving situations or complex elaborations of synoptic tables, concept maps, or timelines. He often has outdated information, so the return on some concept or definition by an author at present will be that he has information up to a specific point in time. If complex or difficult questions are assigned, the response time will not be as immediate as it would be if the question be what are the primary colors?[7]

As advantages or strengths, it can do the work of a virtual assistant, generate innovative ideas, and adapt concepts to multiple situations, among others; it is such a powerful search engine that it can locate the necessary information in a natural language so that it can be understood by anyone.[7]

Regarding background on teacher training, it is possible to highlight, primarily, the teacher training sections of the INFoD. The "Challenges of Artificial Intelligence to Rethink Media Literacy in Schools" section is now open. The aim is to "offer tools, from the perspective of Media and Information Literacy (AMI), to reflect on the challenges imposed by artificial intelligence (AI) in teaching and learning practices".[8]

AMI is crucial for understanding and appropriately using AI in the educational setting. Students and educators must have the skills to evaluate information presented through AI and discern the quality and accuracy of the data. In addition, AMI enables them to understand the algorithms behind AI better and make informed decisions about how to use and apply the technology, both inside and outside the classroom. In short, AMI is essential for considering the potentialities and challenges posed by AI in training processes.[8]

Another precedent is the investigation conducted by the Ministry of Education of the City of Buenos Aires, which interviewed more than 1800 teachers of different levels. This research resulted in an understanding of the knowledge or lack thereof about this new application. One of the most frequently repeated answers was that ChatGPT allows one to expand knowledge in a short period and provides tools to generate innovative practices. This is evidenced by the testimony of teachers who comment on the usefulness in the classroom, but more importantly, the value of a teacher advisor.[9,10,11]

Finally, it is clear the importance of AI training and ChatGPT by the faculty of the Maryland Educational Unit; the Beijing Consensus on Artificial Intelligence and Education states that "the systematic integration of AI in education makes it possible to address the greatest challenges in education today, as well as to innovate in teaching and learning practices".[5]

Such a model will be the most effective and commensurate for "creating technology-integrated training programs".[12,13]

Figure 1. Assure model
Source: Roberto Jasinski, 2022

CONCLUSIONS

The incorporation of artificial intelligence (AI) in education, particularly through tools such as ChatGPT, represents a profound and challenging transformation in teaching and learning processes. Throughout the text, it is evident that education has evolved significantly over the last decade, not only in terms of infrastructure and actors but also in the paradigms that support it. The contemporary school faces an urgent need to adapt to a digitalized context, in which emerging technologies are already an integral part of students' daily lives; therefore, they must be critically integrated into pedagogical practices.

The position of authors such as Inés Dussel and Laura Marés highlights the tension between teacher resistance and the need for conscious appropriation of these technologies. It is no longer possible to relegate technology to an auxiliary role; today, it is an integral part of the educational environment. The teacher must, therefore, cease to be a mere transmitter of knowledge and become a competent mediator capable of guiding the ethical, reflective, and creative use of tools such as AI.

ChatGPT, in particular, has proven to be a disruptive technology that offers multiple advantages, facilitating the search for information, generating ideas, and allowing adaptation to different contexts. However, it also presents significant limitations, such as erroneous, outdated, or unsuitable responses for tasks of greater cognitive complexity. This duality obliges educators to train in its proper use, avoiding its complete replacement of human interaction and promoting media and information literacy (MLI) that enables students and teachers to evaluate the content generated by these tools critically.

Teacher training initiatives, such as those promoted by INFoD or the surveys conducted by the Ministry of Education of the City of Buenos Aires, suggest that continuous training is a fundamental pillar for addressing these changes. In line with the Beijing Consensus, the systematic integration of AI will only be beneficial if it is accompanied by a redesign of teachers' professional competencies and programs that strengthen their capacities.

In short, AI and tools like ChatGPT should not be seen as threats but as opportunities to rethink and enrich teaching. Their impact will depend on the educational system's capacity to integrate them critically, with a renewed pedagogical approach committed to improving learning.

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CONFLICT OF INTEREST

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