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AI as a Tool for Educational Transformation: Keys for Responsible Implementation Fostering Digital Well-being

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Abstract
Artificial Intelligence has the necessary potential to transform education, but careful planning of its implementation is essential, knowing what we are doing and why we are doing it. The opportunities for AI to personalize learning, foster connections between subjects, deepen concepts and put learning into practice are enormous. However, as these technologies advance, it is important to rethink our relationship with them, i.e., to assess digital well-being. It

is essential to develop a formative, healthy and safe relationship with technology, with the main objective of finding a balance in digital life by developing skills and competences that allow minimizing the risks without losing the benefits. This chapter addresses some of the challenges that need to be considered when implementing AI in education, while respecting the digital well-being of teachers and students, and offers recommendations that may inspire those who wish to start working with this technology in the classroom.

Keywords: AI ethics; Artificial Intelligence in education; digital well-being; personalization of learning; teacher training.

5.1. AI in Education

The current society of knowledge and information has brought about changes in the nature and scope of education, leading educational systems worldwide to adopt strategies and policies to introduce and improve the use of digital tools (Timotheou et al., 2023). In this context, in recent years, international organizations have emphasized the importance of structuring digital literacy, which should be present at all levels of the educational sphere, with the primary goal of integrating technologies into teaching-learning environments. For example, UNESCO (2016) already stresses the need to use technologies effectively, promoting both the expansion of freely accessible resources and the implementation of distance learning with the aim of improving the quality of education.

To this reality of the integration of digital skills in education, which has been present for decades, has been added, with almost unexpected vehemence, the emergence of Generative Artificial Intelligence (GAI), especially after the boom caused by the release of the new version of OpenAI's ChatGPT-3 in 2022. This tool, capable of generating texts of high argumentative quality and with a great ability to maintain a coherent conversation, attracted one million users in the first five days after its launch, becoming the fastest growing application in history. Given the capabilities of GAI, this phenomenon has a particular impact in the field of education (García Peñalvo, 2023) and has become an emerging topic in research on digital literacy in educational settings (Ayuso del Puerto & Gutiérrez Esteban, 2022; Su et al., 2023).

Education plays an important role in promoting social justice (Atterberry-Ash, 2023), fostering equal opportunities and encouraging responsibility in building a fairer and freer society. In a world where digitalization has such a strong presence and influence on people's lives, it is essential that all students have the opportunity to learn and explore the use of digital tools and, in particular, artificial intelligence.

In this way, authors such as Baidoo and Owusu (2023) propose to explore the potential of ChatGPT to improve education and student learning. In a new scenario where there are tools with immense potential and opportunities (and also dangers, it must be said), it is essential to experiment with and understand them in order to promote the development of strategies and the creation of motivating activities that create a dynamic and engaging educational environment (Grané, 2024). Sabzalieva and Valentini (2023) propose several strategies for integrating and using the OpenAI application in the classroom, assigning it roles such as study companion, Socratic opponent, complementary guide, co-designer or dynamic evaluator, among others.

AI enables tasks that enhance the learning experience of students, such as creating summaries or extracting ideas from text, translating text into different languages and improving their writing, creating videos or images from text, overcoming writer's block when starting to write, acquiring vocabulary through conversation, or self-assessing knowledge by receiving instant feedback on performance in assignments or exams (Vicerrectorado de Innovación Educativa, 2023).

Beyond the mere integration in the classroom, the aforementioned digital tools are widely used by teachers in designing activities, formulating questions and planning lessons (Sánchez Vera, 2024). This highlights the close collaboration that can be established between these technologies and teaching.

Each of these ideas about the use of AI tools in education should include a natural discussion about their application, thus fostering debates inherent to the use of these applications, such as the limited ways in which educational processes can be modelled, the different ways in which AI technology risks perpetuating social harm for students at risk of exclusion, or the ecological and environmental costs of data-intensive AI forms and devices (Selwyn, 2024); as well as other ethical aspects such as the mis-

use of information (partial or biased), the creation of fake information (*deepfake*) or the sharing of personal data and the lack of legislation in this regard.

The absence of a regulatory framework for artificial intelligence is hampering progress in its research and development. The definition of parameters for action, limits, conditions and responsibilities is crucial for progress in this field. It is necessary to determine whether these technologies can be held legally responsible for their actions, either wholly or in part. The lack of clarity in this respect creates uncertainty and limits investment and the development of new AI applications, especially when these tools are used with minors.

Establishing clear and specific regulations for AI would promote responsible innovation, protect students, teachers and families, and ensure the ethical and safe development of this technology.

AI and learning

The advent of AI could lead to a radical change in the way we value truth. In a future where artificial intelligence is ubiquitous, verisimilitude, or the appearance of truth, may be more important than truth itself (Casanovas, 2023). However, learning and truth are closely related. Learning is the process of acquiring new knowledge or skills, and truth is the correspondence between knowledge and reality. Therefore, learning should be a driving force that brings us closer to truth.

Learning aims to develop critical skills in students by promoting holistic thinking and reasoning. These skills allow evaluating information objectively and drawing one's own conclusions. It is this way of being and doing in the classroom that this chapter seeks to support.

From a pedagogical point of view, the emergence of AI may require a repositioning of the true role of the educational institution. Organic Law 3/2020, of December 29th, which amends Organic Law 2/2006, of May 3rd, on education (BOE number 340, Wednesday December 30th 2020), emphasizes the development of competences and personalized learning. The aim is that no student should leave compulsory education without the necessary skills to take on personal, academic, social and professional

projects. The competency-based approach goes beyond the mere acquisition of knowledge and focuses on the ability to apply it to real-world problem-solving situations.

According to Galán, Ruiz and Jiménez (2023), generative AI can play a relevant role in achieving these objectives, as it can promote the following:

- Personalized learning, adapting content and activities to the individual learning needs and styles of each student.
- Develop critical thinking by exposing students to different perspectives on a topic and helping them to critically analyze and evaluate information.
- Creative problem solving, encouraging students to explore different approaches to problems and find innovative solutions.
- Personalize content, using generative AI to create personalized learning materials tailored to each student's knowledge, skills and interests.
- Provide feedback, analyzing students' work and providing valuable information to help them progress.

In addition, AI can mimic and enhance certain human skills in various areas:

- **Listening**: automatic translation and speech recognition (Delić et al., 2019). AI can automatically translate text and audio from one language to another, facilitating communication between students and teachers from different cultures. Speech recognition allows AI to interact with students naturally through spoken commands.
- **Speech**: voice synthesis and human-machine dialog (Chiba et al., 2019). Speech synthesis allows AI to naturally generate spoken text, which can be useful for creating educational materials or assisting students with learning disabilities. Human-machine dialogue allows AI to interact with students in a conversational manner, answering their questions and providing them with information.
- **Observation**: computer vision, image recognition, and text recognition (Paglen, 2019). Image recognition allows AI to analyze images and videos to extract information, such as the

number of people in a classroom or the type of activities taking place. Text recognition allows AI to read and understand written text, which can be useful for correcting assignments or translating documents.

- **Thinking**: theorem proving (Sarma & Hay, 2017). AI can prove mathematical theorems, which can be useful for mathematics education and research.
- **Learning**: scientific learning and context adaptive learning (Colchester et al., 2017). Machine learning allows AI to learn autonomously from data, which can be useful for creating personalized tutoring systems. Intelligent adaptive learning allows AI to create learning plans for each student based on their needs and learning style.

Artificial Intelligence (AI) can not only transform education, but also free up teachers to spend more time with their students. Currently, much of a teacher's time is spent on repetitive tasks such as grading papers and exams, limiting the time available for teaching, research, and personal interaction with students. This is where AI plays a fundamental role. Systems such as Holstein, McLaren, and Aleven's intelligent tutoring system (2017) or Cui, Zhang, and Li's intelligent assessment system (2019) automate these repetitive tasks, freeing teachers from administrative burdens and allowing them to focus on what really matters: human interaction and each student's individual learning experience.

Finally, it is important to note that AI technology can also enhance teachers' skills, helping them to provide students with personalized and accurate pedagogical guidance that they could not provide before, and significantly improve the efficiency of knowledge transfer. In addition, AI allows teachers to devote more time and energy to communicating with students, allowing them to focus on developing other competencies in students.

5.2. Digital Well-being and AI

In the popular imagination, AI is seen as a possible threat, but it is important to recognize its potential as a catalyst for digital well-being when implemented ethically and responsibly. Digital well-being has become a relevant topic in the age of technology,

especially with the increasing integration of AI into various aspects of everyday life and education. Technological change is very fast and generates a lot of impact.

This phenomenon of immediacy and frugality also influences concepts and theories, so we have to consider digital well-being as a dynamic concept influenced by technological and social changes (Vanden, 2021). Digital well-being is often implicitly defined by juxtaposing it with undesirable habits (e.g., drawing a parallel between technology use and unhealthy eating habits) or with afflictions that represent digital discomfort, such as technology addiction. This is surprising, as well-being is usually understood not as the absence of an undesirable condition, but rather as "complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (World Health Organization (WHO), 2020). At this point, we need to move towards a conceptual construction of well-being based on positive aspects and not on the absence of negatives.

The "quest for digital well-being" seems to be the challenge to be overcome (Quispe et al., 2020). AI can be the problem or the solution, as it can offer personalized solutions that promote healthy habits in the use of technology, thus improving the quality of life of users. At the same time, it is crucial to address the challenges it poses, such as privacy and the digital divide, to ensure that its integration in education effectively contributes to the well-being of students and educators. In this sense, the United Nations advocates for the responsible use of AI, highlighting its potential to contribute to the achievement of the Sustainable Development Goals (SDGs) (United Nations, 2023). AI is presented as a powerful tool to address the complex challenges of the present, allowing us to solve current problems with the technologies of the future.

This technological revolution has led professionals, researchers, scientific societies and institutions to open the debate on AI in education. UNESCO has developed a *Guidance on Generative AI in Education and Research*. This document explores some of the ways in which AI can contribute to digital well-being, such as: a) information management and privacy; b) emotional well-being and mental health; c) education and digital literacy; and d) prevention of cyberbullying and online violence.

Conscious, balanced and safe use

Conscious and balanced use of AI is essential to maximize its benefits and mitigate potential risks in various fields, including education and research. Adopting a reflective and ethical perspective in the implementation of AI can help ensure its positive impact on society (Moya & Eaton, 2023).

Some key considerations to promote a conscious and balanced use of AI are:

- Awareness of AI capabilities and limitations: It is critical to consider the capabilities and limitations of AI when using it in educational and research contexts. Recognizing that AI is a powerful but not infallible tool can help avoid unrealistic expectations and poor decisions based on overestimating its capabilities.
- Impact assessment and ethics in AI implementation: Before integrating AI into educational or research processes, it is important to conduct a comprehensive assessment of its impact on users, society, and the environment. Consideration of ethical issues such as equity, transparency, and accountability can guide the ethical implementation of AI and ensure that it is used responsibly and fairly.
- Promoting digital literacy in AI: Promoting digital and AI literacy among users, including students, researchers, and professionals, is key to the conscious and balanced use of technology. Providing education on the basic principles of AI, its applications, and its ethical implications can empower individuals to make informed and ethical decisions about its use.
- Establish clear policies and guidelines: Developing clear policies and guidelines for the use of AI in educational and research environments can provide a regulatory framework that promotes conscious and balanced use. Establishing protocols for security, privacy and ethics can help mitigate risks and ensure the responsible use of AI in decision-making and knowledge generation. In this regard, the European strategy on AI aims to "build a resilient Europe for the Digital Decade", where people and businesses must be able to enjoy the benefits of AI while feeling safe and protected, and ensuring that AI is human-centered and trustworthy (An EU approach to artificial intelligence | Shaping Europe's digital future, 2024).

- Security, privacy, and separation are fundamental issues to consider in the development and application of artificial intelligence (AI). These elements are critical to ensure user trust, protect sensitive data, and mitigate potential risks associated with the use of AI in various contexts, including education and research. Ensuring compliance with data protection regulations, such as the European Union's General Data Protection Regulation (GDPR), is essential to protect user privacy (General Data Protection Regulation (GDPR), 2016).

5.3. Formative Use of Artificial Intelligence and Academic Integrity

The debate about the use of artificial intelligence (AI), especially large language models (LLMs), in academic education revolves around academic integrity. Perkins (2023) warns of the difficulty of determining the originality of content generated by students using LLMs, as the variability of text generation and the limitations of current plagiarism detection tools make it difficult to detect the use of these models.

The integration of AI in education therefore poses significant challenges to academic integrity, but also offers opportunities to enrich the educational process. It is imperative to adopt a balanced approach that promotes the ethical and responsible use of AI and ensures that assessments accurately reflect students' skills and knowledge.

Evaluations and good practices

In the context of face-to-face instruction, traditional assessments -such as written and oral exams administered in person- are considered virtually risk-free in terms of academic integrity. These assessment methods allow instructors to directly observe students' thought processes, ability to reason, and depth of understanding. While valuable, these methods may not fully capture the abilities of all students, especially those who may not perform well under pressure or have different learning styles.

However, AI-powered assessments offer the opportunity to personalize and adapt tests to meet the individual needs of stu-

dents. Tools such as adaptive learning systems can adjust the difficulty of questions in real time based on students' responses, which could provide a more accurate measure of their understanding and skills. Yet, this approach presents challenges related to the authenticity of student responses and the potential for inappropriate use of AI to complete tasks (Ali et al., 2021).

Tasks could be designed to be more complex, mimicking real-world problems in business and academia, and requiring students to explain how, when, and with what data they used AI. This approach promotes not only the development of technical skills, but also the ability to argue and ethically justify the use of AI tools.

Some key points regarding the aforementioned balance are:

- Digital ethics education: It is important to educate students about digital ethics and academic integrity from the beginning of their education. This includes discussions about the appropriate use of AI and how to properly cite AI-generated content in their work (Yufei et al., 2020).
- Advanced anti-plagiarism tools: Develop and deploy anti-plagiarism tools that can detect not only traditional plagiarism, but also AI-generated content. This will require constantly updating the databases of these tools to include examples of AI-generated text.
- Authenticated assessments: Implementing assessments that require the application of knowledge in real-world scenarios, group projects, and oral presentations can help ensure that the work reflects students' true understanding and skills. In addition, the use of proctoring technology during online assessments can help verify students' identities and minimize academic fraud.
- Feedback and ongoing assessment: AI can be used positively to provide immediate and personalized feedback to students. This not only supports continuous learning, but also allows educators to identify areas where students may need additional support.

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