3

The Inclusion of Artificial Intelligence in Higher Education: Moving Towards a digital Educational Transformation

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Abstract
Artificial Intelligence (AI) is recently emerging in higher education institutions, giving rise to a digital revolution that redefines traditional educational approaches. AI is presented as an innovative technological strategy to improve the efficiency, accessibility and quality of teaching processes. However, teachers today lack specific training that would allow them to explore the various pedagogical opportunities that AI applications can offer to accompany and support students in their educational cycle. The aim of this paper is to analyze the relevance of AI and the teaching role in higher educational contexts.

Teachers should take an active role in the inclusion and supervision of AI applications, making use of their ability to personalize learning and adapt to the individual needs of students. To this end, it is necessary to have acquired digital competencies that allow guiding students in the responsible and critical use of these tools, knowing all of their implications and risks. Collaboration among education professionals will be essential to ensure an effective and ethical implementation of AI in the educational environment.

Keywords: Artificial Intelligence, assessment, learning, teaching.

3.1. Introduction

In recent times, Information and Communication Technologies (ICT) are revolutionizing teaching and learning processes, leading to various advancements across all educational levels. Students are changing the way they learn and access information, while educators are reflecting on their pedagogical practices and introducing new teaching methodologies to adapt to the digital age. The use of technological tools in the educational setting is beneficial for improving the quality of teaching and providing students with greater flexibility and access to knowledge both inside and outside the classroom (Zawacki-Richter et al., 2019).

Higher education institutions are transforming their traditional teaching models to adapt to a society and technology in constant evolution. Therefore, universities must become digitized, provide accessible learning resources and platforms, update academic disciplines, and thus make them more attractive to students (Escotet, 2023).

Among the various technological resources proliferating today, AI has received special attention for its application and impact on educational processes (Aparicio-Gómez, 2023). AI is presented as a technological approach that seeks to develop systems and algorithms capable of performing tasks that, if carried out by humans, would require the use of intelligence.

John McCarthy was the first computer scientist to coin the term "Artificial Intelligence" at the Dartmouth Conference in 1956, based on what was previously known as "computer simulation" (Russell & Norvig, 2010). Since 1956, we have encountered different theoretical interpretations of AI in various fields, such as chemistry, biology, linguistics, and mathematics. From

an educational perspective, AI is understood as a set of computer systems that can perform human processes, such as learning, adapting, synthesizing, and using data for complex processing tasks. Nowadays, advancements in AI are progressing at an ever-increasing pace, impacting the way education is proposed and planned in higher education. In this context, it is also important to note that machine learning is a fundamental area of AI, described as a branch of AI that includes software capable of recognizing patterns, making predictions, and applying them to situations that were not initially predetermined (García-Peña et al., 2020; Hirsch-Kreinsen, 2023).

AI is revolutionizing the way education is delivered and taught, as it allows for personalized teaching approaches and interactive learning experiences. By providing real-time feedback, AI can make interactions between people and computers more personalized and assist in knowledge acquisition (Popenici & Kerr, 2017). AI systems can provide different learning approaches and personalized assessments based on the strengths and weaknesses of students. It also helps identify educational difficulties and provide appropriate responses to each of them. However, Generative AI (GenAI), which can create a variety of data such as images, videos, audio, or text, is revolutionizing the way teaching is taught, planned, and managed in higher education (Dempere et al., 2023).

As we move towards an increasingly digital era, it is necessary to conduct an analysis of the strengths and weaknesses of these technological tools to fully leverage their transformative potential and ensure an equitable educational future. The purpose of this work was to analyze, from an educational perspective, the implications of AI in Higher Education, as well as the teaching role in facing the challenges presented in the teaching-learning processes in the current educational reality.

3.2. Artificial Intelligence in the Current Educational Reality

The educational reality in Spanish classrooms has undergone significant modifications following the approval of the new leg-

islation, Organic Law 3/2020, of December 29, also known as LOMLOE.

Since 1970, there have been six major educational laws that have reformed the Spanish educational system, with perhaps this latest one demanding a profound change from the active body of teaching professionals.

These brand-new changes in methodology and in the evaluation system require teachers to train and familiarize themselves with each of the elements involved in teaching processes. The use of learning situations that focus on active methodologies and student motivation towards greater personalization of learning, the application of Universal Design for Learning (UDL) with its three principles of action (representation, expression, and motivation), and a new exclusively competency-based assessment are the reasons for such a significant change.

The publication of this new legislation and its regional developments coincided temporally with the main changes in the democratization of the use of AI applications, based on the Chat-GPT platform from OpenAI, which gave rise to a multitude of new applications that influence the field of education (Goenechea-Permisán & Serván-Melero, 2022; Luckin, 2022).

Why do we link the new legislation to the use of AI in the new reality of classrooms? Because the changes applied to the educational system promote symbiosis between both aspects. Below, we outline what LOMLOE requests from the teaching staff to help us understand it better:

a) Learning based on "situations or experiences" that are linked to the students' close reality.
b) These situations must be relevant and help students achieve the competency profile (specific competencies, key competencies, and exit profile) expected from all students upon completing compulsory schooling.
c) To achieve this competency profile, didactic sequences must be created with the following characteristics: heterogeneity, they should consist of activities, problems, tasks, etc., of different styles that favor the different characteristics of our students; multilevel, they must address the different levels established by Bloom's taxonomy to ensure training and competency improvement, as mandated by the law. This is taken to

the extreme when the purpose of the learning situation is the creation of a product, with "creating" being the pinnacle of Bloom's taxonomy.
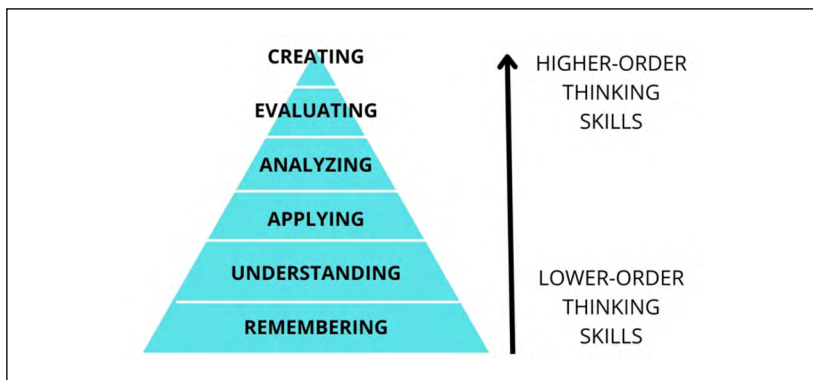
Figure 3.1. Bloom's taxonomy. Source: developed by author.

If we understand the change that implies the entire educational system being dynamized through these premises, we will see that the traditional use of lectures and activities/tasks focused on "remembering" or "understanding," which until recently were predominantly used in Spanish classrooms, fall into the background compared to the need to "multilevel" and "heterogenize" the didactic sequences of our learning situations.

Let us combine this with the emergence of the democratic use of AI models in the daily lives of all of us, including our students. The changes proposed by the new legislation are a great success in addressing this reality prevailing in classrooms today. AI models based on ChatGPT help automate proposals for exercises related to lower-order thinking. That is, proposals such as "summarize the book you have read" are easily achievable through AI applications. However, applying what has been read to the creation of an original product (such as a podcast, a role-playing game, dramatization, or an interactive mind map) requires the application, analysis, evaluation of processes, and creative capacity of the students (Luna-Arcos, 2021; Pueyo & Santisteban, 2023).

Therefore, the new educational reality brought about by the democratization of AI use by the population is indeed compatible with the changes requested by the new legislation. Intensive

teacher training will be necessary in both the good design of learning situations under the "umbrella" of UDL and in the competency-based assessment of students. But once this model can be applied, its synergy with the technological changes brought about by AI in the teaching-learning process will be a great advantage for the entire Spanish educational system.

With the integration of AI into education in Spain, a range of possibilities opens up beyond simple task automation. For example, it can be applied to personalized attention to students' needs and styles. This not only facilitates an individualized approach to the teaching process but also allows teachers to identify and address areas for improvement more efficiently (Mingorance-Estrada et al., 2023).

Additionally, AI can play a fundamental role in evaluating students' progress and skills. Automated assessment systems can provide instant feedback, allowing educators to adjust their teaching strategies in real time and reduce the time invested in such traditionally task-intensive activities (Murgatroyd, 2023). This quick response capability contributes to a continuous feedback cycle that benefits both teachers and students.

However, it is important to address the potential ethical and social challenges that may arise with the widespread incorporation of AI in education. Student data privacy, equity in access to technology, and the need to maintain a balance between technology and human interactions are critical aspects that must be considered in this new educational paradigm.

In conclusion, the relationship between AI and education in Spain promises a significant transformation in the teaching-learning process. While ensuring ethical implementation is necessary, the symbiosis between AI and technological changes can provide a substantial boost to the Spanish education system (supported by the new legislation and the methodological change initiated by it), preparing students for an increasingly digital and complex future.

3.3. Initial Teacher Training and its Implication in the Use of Artificial Intelligence

The growing integration of AI in higher education institutions poses significant challenges and substantial transformations for the teaching staff. As noted by Kuleto et al. (2021), this phenomenon highlights the frequent lack of specific training among professionals, depriving them of the ability to fully explore the pedagogical opportunities offered by AI applications. In this context, attention is focused on initial teacher training, emphasizing its crucial role in the effective integration of AI into Higher Education educational environments.

In the current scenario, initial teacher training is at a critical point that demands adaptation to emerging demands related to educational digitalization and the increasing implementation of AI (Renz & Hilbig, 2020). In response, it is imperative that teacher training programs incorporate meticulously designed specialized modules to provide future educators with the necessary digital competencies (Bonfiel et al., 2020). These competencies not only involve a deep understanding of the theoretical and practical principles of AI but also the ability to apply this knowledge specifically in the field of education.

In this sense, teacher training should focus on familiarizing educators with a variety of AI tools and platforms, providing them with the ability to critically evaluate the effectiveness and applicability of these in the teaching-learning process (Chan, 2023). This formative stage seeks not only to fill a knowledge gap but also to promote a reflective and analytical approach to technology integration.

Beyond the acquisition of technical skills, teacher training in the field of AI should focus on the development of advanced pedagogical skills. This implies training educators to design personalized learning experiences that fully leverage the capabilities of AI (Celik et al., 2022). These experiences should be able to dynamically adapt to the individual needs of students, enhancing the efficiency of the educational process and promoting a more inclusive and student-centered learning environment.

Additionally, the role of teachers in the context of AI cannot be limited solely to technical aspects; it also involves the active

promotion of an ethical approach to technology use (Cope et al., 2020). Teacher training should address crucial issues related to privacy, equity, and transparency in the use of AI. This ensures that educators are fully equipped not only to use these technologies effectively but also to guide students in their responsible and critical use.

In this broader context, initial teacher training is considered to play a fundamental role in preparing educators to address the challenges and capitalize on the opportunities presented by the inclusion of AI in Higher Education (George & Wooden, 2023). Comprehensive and specialized training not only empowers teachers to effectively lead digital educational transformation but also ensures an ethical and effective implementation of AI in educational processes.

To achieve this goal, collaboration among educational institutions, education professionals, and AI experts is considered an essential component. The synergy of these actors allows for the development of innovative educational strategies, addressing ongoing ethical challenges, and continuously adapting teacher training to reflect rapid advances in AI (Zhang & Aslan, 2021).

In conclusion, the integration of AI into Higher Education represents a paradigm shift that requires a proactive response in terms of teacher training. This process must encompass not only the transmission of technical knowledge but also the development of advanced pedagogical skills and solid ethical awareness. Only through comprehensive and collaborative training can we ensure a successful educational transition towards a more advanced and technologically integrated paradigm.

3.4. Conclusions

In contemporary times, there has been an imminent emergence of AI in institutions of higher education, triggering a digital revolution that redefines conventional educational approaches. This radical change responds to the growing need to enhance the efficiency, accessibility, and quality of teaching processes. Despite being presented as an innovative technological strategy with the potential to transform higher education, AI faces significant challenges, one of which is the lack of specific teacher training to

fully explore the various pedagogical opportunities that these applications can offer students in their learning journey.

In this context, the relevance of AI and the role of faculty in higher education contexts were analyzed. The fundamental importance of active faculty participation in the inclusion and supervision of AI applications is recognized, assuming a central role in these processes (Kamalov et al., 2023). The ability to personalize learning and adapt to the individual needs of students becomes an essential element for the success of these initiatives.

One of the crucial challenges highlighted is the lack of specific teacher training in the field of AI, an aspect that requires priority attention. This is because the rapid evolution of technology demands that faculty acquire specific digital competencies to fully leverage the pedagogical opportunities of AI in the classroom (Meylina et al., 2021). Training must go beyond mere technical understanding of AI applications; it is imperative that faculty develop skills to effectively integrate these tools into their pedagogical practices.

This teacher training should encompass understanding the fundamentals of AI, its application in the field of education, and the ability to critically evaluate available tools. This training will not only ensure that educators are aware of the latest technology trends but also enable them to guide students in the responsible and critical use of AI applications (Almusaed et al., 2023).

Faculty members, by assuming an active role in the inclusion and supervision of AI applications, become a catalyst for the success of these technologies in higher education. Furthermore, Kim et al. (2022) pointed out that active faculty presence is essential to ensure that AI is used effectively and ethically, and student-centered. Educators must play a proactive role in selecting AI tools aligned with pedagogical objectives and fostering an inclusive learning environment.

The ability of AI to personalize learning according to the individual needs of each student is one of its most promising aspects. However, to maximize this potential, it is essential that faculty play an active role in configuring and adapting tools to meet the specific needs of their student group. Therefore, effective personalization of learning through AI requires a deep understanding of students' individual characteristics by faculty (Minn, 2022).

Collaboration among education professionals emerges as a crucial element to ensure the effective and ethical implementation of AI in the educational environment. This collaborative approach involves not only sharing knowledge and experiences but also working together to develop digital competencies that enable ethical and responsible guidance of students in using these tools.

Ethics in the implementation of AI in higher education is positioned as a topic of great importance. Faculty must be equipped with knowledge about the ethical and social implications of AI, as well as the ability to guide students in the reflective and critical use of these tools. Thus, ethical training of faculty is essential to ensure that AI is used fairly and equitably, avoiding biases and discrimination (Roche et al., 2023).

Additionally, collaboration among education professionals is presented as a key element for the effective implementation of AI in higher education. The diversity of knowledge and skills within the faculty allows for a holistic approach that encompasses everything, from selecting AI tools to adapting pedagogical methods, with the aim of fully leveraging these technologies.

In conclusion, the integration of AI in higher education is a reality that poses significant challenges and opportunities. The active role of faculty is essential to ensure that AI is used effectively and ethically, and student-centered. Specific training in digital competencies and ethics, collaboration among education professionals, and the ability to personalize learning are key elements to fully leverage the transformative potential of AI in higher education. To address current and future challenges of the implementation of AI in higher education, continuous commitment to faculty training, the development of student-centered AI tools, and the promotion of a culture of collaboration and ethical reflection in educational institutions are necessary. Haga clic aquí para escribir texto.

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