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The Evolving Role of the Teacher in the Age of Artificial Intelligence:

Challenges, Opportunities, and Implications for Moroccan Higher Education.

Auteur 1 : JENFI Yosra,
Auteur 2 : ZITOUNI Abdelkrim,

JENFI YOSRA, Doctorante à la Formation Doctorale : Sciences de l'Education, CEDOC : Homme-Société-Education, Structure de Recherche : Politiques Educatives et Dynamiques Sociales (PEDS), Axe de Recherche : Management des Institutions Educatives, Faculté des Sciences de l'Education, Université Mohammed V de Rabat, Maroc**.**

ZITOUNI Abdelkrim, Enseignant-chercheur, Département Innovation Pédagogique et Management des Systèmes d'Education et de Formation, Faculté des Sciences de l'Education, Université Mohammed V de Rabat, Maroc

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Abstract

Artificial Intelligence (AI) is progressively integrated into higher education systems worldwide, offering new opportunities to enhance learning and teaching. This article explores the potential role of AI in replacing or complementing human teachers, focusing on its impact on grading, personalized learning, and the irreplaceable human skills in education. Based on a literature review, the study highlights the opportunities and challenges associated with AI adoption, as well as the need for teacher training to integrate AI effectively. While offering a global perspective, the article also pays particular attention to the Moroccan context as an example of a developing country modernizing its higher education system. The article concludes with recommendations for educators and policymakers to create a productive synergy between AI and teachers, enhancing educational outcomes without diminishing the human aspect of teaching.

Keywords:

Artificial Intelligence, Teacher's Role, AI Integration, Personalized Learning, Educational Quality

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Introduction

Artificial Intelligence (AI) is transforming many sectors including education (Yeruva, 2023). It changes the way we learn and teach. AI makes education personal, fun, and effective (Alneyadi, Wardat, Alshannag, & AbuAl-Aish, 2023). Schools are increasingly using AI tools to enhance learning, assist teaching, and increase student success. In Morocco, this change is gradually taking place, but there has been a lack of empirical study into the impact of AI on the real world. Most of the research focuses on Western education systems. Moroccan higher education challenges and opportunities are highly specialized, and the students' use and interaction with AI technologies is key to their learning. To address these issues, this study asks the following questions: will artificial intelligence replace all human teachers? What are those human skills that we can't replace in education where AI is so much a part of it? What challenges do teachers face in learning to be able to use AI tools in effective and robust teaching, and how can we make a good partnership between human and AI? This study is based on a review of academic research, case studies, and recent expert reports. The objective of this article is to illustrate the impact of AI on educational systems and look to how AI impacts education through the changing role of teachers. The article is divided into three main sections. In the first one, we gather the literature that is currently being written in education on AI in education in the field and discuss the current state of AI in education with the focus on the personal learning environment, chatbots, AI-supported grading, and the overall impact of these technologies. The second section is about the changing role of teachers and how these are changing, and the use of specific human skills are still relevant to teachers today, and how to prepare them to integrate AI into education. The third section is a teacher training paper on the challenges and opportunities for AI and what could be the future of human-AI collaboration in education for both humans in education and AI in the future.

Literature Review

Artificial Intelligence (AI) refers to technologies that enable machines to mimic human abilities such as learning, reasoning, and decision-making. In education, AI supports learning, reduces administrative work, and increases student engagement with adaptive and interactive tools.

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1.Personalized Learning

AI's personalized learning has revolutionized how students learn (Rana et al., 2022). Personalized learning provides education for students based on their individual needs, strengths, weaknesses, and interests (Samad, Hamza, Muazzam, Ahmer, et al., 2022). Technology helps to adapt teaching to each student's learning level and pace (Zarei et al., 2022). AI is a big part of the solution in personalization as algorithms are used to analyze data and identify patterns in students' learning habits, preferences, and achievements (Samad, 2022). It can then create learning experiences that are specific for those students' learning needs (Samudrala et al., 2022).

1.1. Chatbots in Education

AI chatbots can enhance the personalized nature of learning experiences of individual learners by delivering instruction that is customized to them (Daniel, 2020). They may also be able to cater to different learning styles and speeds, which has the potential to make education more inclusive and accessible (Cheng & Chau, 2016). Quick feedback from AI chatbots can help students assess their understanding and adjust their learning strategies in real time (Zhao et al., 2021). Additionally, chatbots can engage students in conversation so that the students become active learners (Wegerif, 2006; Rudolph et al., 2023b). Chatbots can also ask hard questions to students to gain more understanding so that students think and become critical thinkers as well and to further develop their knowledge of the topic (Wegerif, 2006; Rudolph et al., 2023b). They can also help with formative assessment with immediate feedback and guidance to improve (Siemens et al., 2015). According to Rasul et al. (2023), chatbot technology has been shown to have positive effects on different aspects of learning such as reasoning capabilities, learning outcomes, knowledge retention, and student interest and engagement.

1.2 AI in Grading and Assessment Processes

AI in education has great potential to improve learning processes, simplify administrative work, and facilitate personalized education. AI tools develop customized learning systems to adapt content to a student's interests. That allows for more customized learning paths and more engagement. Automated grading systems reduce the workload of teachers, which can be used to work on more complex teaching tasks. AI-powered chatbots and virtual tutors are ready to help students in the moment, so they get help beyond the classroom. AI helps institutions track their students' performance and intervene early to improve learning outcomes. It can also make learning accessible to students with disabilities through speech-totext and text-to-speech. But with all that said, AI has limitations in education. Learning in AI may become less personal, as it cannot replicate the emotional intelligence, mentoring, and nuanced reasoning that human teachers can provide. There are ethical issues related to data privacy and security with AI systems that require a lot of student data and data use consent and also can be abused.

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Algorithmic bias is a big problem. AI models trained on biased data can reinforce, rather than alleviate, inequality. In addition, over-reliance on AI would hurt students' critical thinking and problem-solving skills if they depend on automated solutions too much. Finally, AI is a significant investment that will make it less available to underfunded institutions and exacerbate inequalities in education.

1.3 Irreplaceable Human Skills

Human intelligence possesses features that no artificial intelligence can replicate. AI mimics human cognitive processes; however, it doesn't have autonomy, consciousness, and the ability to make complex decisions outside of a set pattern. AI works automatically, and human intelligence is more autonomous; it is influenced by experience, emotions, intuition, and culture (Fink, 2012). And whereas machines work with a set of data processing methods, humans learn through real-world problems and adapt dynamically in ways that are better than that of AI.

One major difference between human and artificial intelligence is the depth of human cognitive function. Learning is more than just gathering information; it's about the connection of knowledge, insight, creativity, and implicit understanding (Polanyi, 1962; 1966). Creativity is not just logic or computation; it's emotion, intuition, and embodied knowledge—things that machines can't replicate. While AI can look for patterns in data, it doesn't have the deep emotional depth to innovate with what it has learned.

Intelligence is also inextricably connected to culture and socialization. Humans develop not only cognitive skills but also social and emotional intelligence through interaction with others. Communication is more than just spoken words, but also facial expressions, gestures, emotional understanding, and cultural practices that AI cannot fully understand or replicate (Suzuki, 2023). These non-verbal cues, conditioned by culture and social arrangements, are critical to human interaction and decision-making. And through cultural exposure and socialization, human intelligence develops. AI systems, by contrast, are limited by their initial programming and training data, which prevents them from providing a true contextual understanding (Wulf, 2013). In addition to that, one of the most fundamental aspects of human intelligence is ethical reasoning. People make decisions based on logic as well as moral values that can vary across cultures. AI can be programmed to do so, but it can't understand moral dilemmas or act with real empathy. This is why discussions on AI ethics are led by organizations including UNESCO and the OECD, emphasizing that technology should support human decision-making and values (OECD, 2019; UNESCO, 2021).

Finally, AI can assist in some cognitive functions but can't compete with the depth, complexity, and flexibility of human intelligence. The human mind is formed from an entire lifetime of experiences, emotions, cultural influences, and ethical considerations. And the human mind is far from being replaced by artificial intelligence.

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2. Institutions exacerbate educational inequalities.

2.1 Irreplaceable Human Skills

Human intelligence is not an artificial intelligence in itself. AI is meant to simulate human thinking, but it does not have autonomy, awareness, or the ability to make complex decisions and do things outside of fixed patterns. While AI processes things automatically in real time, human intelligence is autonomous and is guided by experience, emotions, intuition, and culture (Fink, 2012). Humans learn from reality and not algorithms, and we can adapt to situations where AI might not be able to, in this regard, to be able to use artificial intelligence without the limitations of AI.

One of the greatest differences between human and artificial intelligence is the depth of human cognitive abilities. Learning is not only about gathering facts; it's about connecting them, gaining insights, being creative, and understanding things that are often unspoken (Polanyi, 1962, 1966). For instance, creativity is not just logic or computation, but also emotions, intuition, and personal experiences—elements that machines do not have the capacity to understand. AI can see patterns in data, but it can't exhibit true originality, emotional depth, and innovation beyond its training.

Intelligence is also tied to culture and social interactions. Humans acquire cognitive, social, and emotional skills through their environment. Communication is not only spoken language but also facial expressions, gestures, emotional awareness, and cultural rituals that AI cannot fully grasp (Suzuki, 2023). These non-verbal cues shaped by traditions and social norms are essential for human interaction and decision-making.

Additionally, human intelligence develops with cultural exposure and social interactions, while AI systems are limited by their initial programming and training data, which restricts their understanding of context (Wulf, 2013).

Another key aspect of human intelligence is ethical reasoning. People make decisions based on logic, moral values, and beliefs that differ from culture to culture. AI can be programmed with ethical guidelines, but it doesn't really understand moral dilemmas and empathy. This is why discussions on AI ethics, as discussed by organizations such as UNESCO and the OECD, emphasize that AI should support human decision-making and values (OECD, 2019; UNESCO, 2021).

So AI can assist and improve some cognitive functions, but AI cannot match the depth and complexity of human intelligence. The human mind is shaped by experiences, feelings, culture, and ethical considerations; it has many things to learn and adapt to, so it is not a matter of artificial intelligence.

2.2 The Role of the Teacher

Valenčič Zuljan (2001) describes teachers' professional development as a deep and ongoing learning process. Teachers are able to develop their understanding and their teaching style. It is a collective,

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professional, and social process of a teacher's journey. It shows them in action in their independence and responsible decision-making.

Teachers develop professionally as well, as they develop and practice their teaching and behavioral skills as they grow as people.

As Kalin (2006) notes, teachers are continuously learning professional skills and working with colleagues. They recognize the connection between their growth and that of their students. They see their role as not just in the classroom, but in building relationships with community members, society, and decision-makers or researchers.

As Beijaard (1995) explains, a teacher's professional identity is based on three things:

- The subject they teach
- Their relationship with students
- Their perspective on their role

The last factor is shaped by the subject they teach and their interactions with students, so it cannot be separated from the other two.

Biddle (cited by Beijaard, 2005, p. 293) mentions that teachers' roles are determined by their tasks, social status, and the views and expectations of others, especially students and parents. Day (2006, p. 610) notes that an individual's identity is formed by their environment, organization, and society. This is why teachers' expectations are typically similar to those of others, and therefore it is difficult to know what is really at stake in their work, whether it's what they expect or what others think of them.

Teachers' expectations of their roles change over time (Beijaard, 2005, p. 284). This change has been largely a result of developing experience, which is a natural part of career development (Beijaard et al., 2004). Teachers' professional growth (including their roles) continues all through their careers and is not a fixed state.

Several factors can affect this transformation, which can be spontaneous or triggered by different elements. This transformation happens gradually, not suddenly. Yung (2001) states there are three stages in this transformation process:

- Awareness
- Comparing with other methods
- Finding actions that are compatible with these alternatives

Teachers' personal commitment is the major part of this process. This involves questioning their views on the teacher's role while accepting change.

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In their professional development, Beijaard and colleagues (2000) put three dimensions of a teacher's role:

- The teacher as a subject-matter expert: knowing the subject well (Poom-Valickis, Oder, andLepik, 2012).
- The teacher as a pedagogical expert: using effective teaching strategies to make the contentaccessible to students.
- The teacher as a didactic expert: designing and managing learning processes to enhanceknowledge.

Thus, Beijaard stresses that although teachers are mostly experts in their areas, that knowledge is not enough for students to learn. They also need didactic and pedagogical skills to support student learning. As other authors point out, teachers need to create the best learning environment by selecting suitable methods (Radovan, 2011). The teacher's job in this regard is not only to share knowledge, but also to help with learning and how to guide and manage the learning processes of students (Poom-Valickis, Oder, and Lepik, 2012).

As Beijaard, Verloop, and Vermunt (2000) state, teaching cannot be reduced to merely technical measures reflected in student outcomes. The didactic part needs to be linked with the pedagogical and ethical aspects. So the teacher is also a pedagogical expert who takes into account relationships, moral values, and emotional factors.

In this complex world, teachers now face more moral, social, and emotional problems. This includes teaching students from a spectrum of cultures and social backgrounds and dealing with disruptive behaviors in the classroom. Teachers need to understand the norms and values of their approach with students (Beijaard et al., 2000).

Kalin and Šteh highlight the link between professional skills and pedagogical-psychological skills. Teachers in their first year should not only have deep knowledge of the subject, but also understand pedagogical and psychological concepts. They should know how to design programs and teaching methods, and also understand their students (Šteh and Kalin, 2006).

Teachers' professional development starts during training as future educators begin to define their professional identity and the roles they will take on in the classroom. This process can be enhanced through mentoring, which has been shown to have positive effects (Gjedia and Gardinier, 2018).

Muršak, Javrh, and Kalin (2011) note that the idea of an ideal teacher is central to professional identity. This ideal is formed from knowledge acquired at university (academic and pedagogical-psychological knowledge) and personal experiences from their own schooling with different teachers.

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3. Training to Master and Integrate AI in Teaching: Challenges and Perspectives

The integration of artificial intelligence (AI) into education is necessary in hybrid and flipped classrooms for enhancing teaching practices and personalizing learning pathways (Luckin et al., 2022). This makes it necessary for teachers and students to be trained in AI to use it effectively and responsibly so that it can be applied in educational settings.

3.1.Essential Skills for AI Integration in Pedagogy

Using AI in teaching requires various skills. According to Zawacki-Richter et al. (2019), educators should develop:

- Technical skills: Being skilled in AI tools like Intelligent Tutoring Systems (ITS) and adaptive learning platforms like Knewton Alta and AI-powered learning analytics.
- Pedagogical skills: The ability to design hybrid teaching activities where AI serves as ahelper, such as using AI to create personalized content for a flipped classroom.
- Ethical and critical thinking skills: Understanding algorithmic biases, ensuring student datais secure, and recognizing how AI affects teaching and learning dynamics (Selwyn, 2023).

3.2.Existing Training Programs and Certifications

There are a number of university programs and certifications for AI in education. Notable examples include:

"AI in Education" by Harvard Online: While not specifically named, Harvard provides resources like the AI Pedagogy Project, aimed at helping educators understand and use AI thoughtfully (Harvard University, 2023).

"Teaching with AI" by MIT (edX): This program focuses on using AI to personalize learning in hybrid and flipped classroom settings.

MOOCs and online training platforms: Opportunities like "AI for Educators" on Coursera and "Artificial Intelligence in Education" on FutureLearn provide flexible, self-paced options for teachers (Zawacki-Richter et al., 2019).

3.3.Future Perspectives and Challenges

While these training programs show real progress, some challenges still exist. First, unequal access to resources, especially in developing countries, raises equity concerns (Çelik et al., 2021). Continuous training is also essential for educators to stay updated with changing AI technologies and their teaching implications. Finally, training programs need to be tailored to fit national and institutional contexts to be effective.

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Although AI cannot replace teachers' crucial roles, it can introduce new teaching methods. Consistent and appropriate training for educators in AI technologies is vital for the successful and ethical use of AI in education.

Towards Optimal Synergy Between AI and Teachers

3.4 Future Scenarios:

As AI continues to advance, we see different scenarios regarding its role in higher education. If implemented properly, AI will not simply replace teachers but will enhance the educational experience by fostering a partnership between machines and educators. Several scenarios emerge in this context.

The Teacher as a Facilitator and Mentor: One key scenario involves changing the teacher's role from simply transmitting knowledge to facilitating learning. Many studies show that AI can take on repetitive tasks like grading and administrative work, allowing teachers to engage more with students (Luckin et al., 2016). Teachers could focus on mentoring and guiding students in projects, discussions, and group learning instead of just delivering content (Holmes et al., 2019).

Personalization of Learning through AI: A major advantage of AI in education is its ability to customize learning to each student. Intelligent systems can tailor the learning process based on students' strengths and weaknesses, making education more personal (Woolf, 2010). AI could provide individualized feedback, suggestions, and resources, creating unique learning environments where students progress at their own pace while receiving ongoing support, easing the burden on teachers for individual follow-up.

AI for Educational Management: AI can also support educational management. It can help organize courses, analyze student performance, and plan teaching strategies. AI systems might identify students' challenges based on their past performance and suggest specific teaching methods. Teachers would then have tools to adjust their teaching according to identified needs while having more time to focus on the human aspects of education (Siemens, 2013). The main question of AI replacing the human teacher completely and whether it should be for education is not yet the main question in higher education. AI can do some teaching but automation will work for some things and you need to know how it is not at the cost of human interaction. And when automation takes over for humans is it a good thing to allow human interaction? Should AI take the place of the traditional teacher and not take over the education experience of students, and why? It also looks at how AI could impact the role of teachers as well. The major research question is: Can AI replace the human teacher entirely and or should AI complement the teacher or replace the human teacher? We analyze the relationship between automation and the human student and the person by examining how AI can help shape the teacher's job role and not replace the teacher as a replacement for and, in this review, how can we assess its impact and how AI can redesign the teacher's job not replace, but supplement the teacher's work in education.

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4. Results and Discussion

Personalized Learning: AI can create personalized learning pathways that match student strengths, weaknesses and preferences (Rana et al., 2022; Samad et al., 2022). AI can be used to help students to be engaged and retain knowledge and that is a great thing for students. Automation of administrative tasks: AI can help reduce teachers' work on the same tasks as usual, like grading and tracking attendance and lesson planning (Luckin, 2017; Selwyn, 2019). Chatbots and Virtual Tutors: AI-powered chatbots are already providing students with immediate support on how to learn and how to engage in interactive and dialog-based learning (Daniel, 2020; Zhao et al., 2021).

They provide quick feedback, which is very much needed for students at school and when they are active. AI is not able to match the human emotional intelligence, creative reasoning or ethical thinking (Fink, 2012; Polanyi, 1966). It also poses privacy concerns, biased algorithms and the prospect of reducing education to a more personal experience for students (Selwyn, 2019; Holmes et al., 2019). We discuss this study and how it can contribute to human teaching. What the results say is that AI can't be the substitute for the human teachers and should be integrated into the teaching of students. The reason is simple: AI can be used to reduce the administrative labor and to provide analytical data for teachers to find students' needs.

With this in mind, teachers can focus more on human aspects of teaching (e.g., mentoring, motivation, and socio-emotional development) (Luckin et al., 2016; Holmes et al., 2019). Personalization and Inclusion: AI can help create inclusive learning environments by adapting content to different learning styles and paces. But in the end, human oversight is required so that such personalization doesn't replicate current inequality (O'Neil, 2016). Ethical and Technical Limitations: AI has no idea about cultural nuances and emotional situations and ethical issues that affect learning. A chatbot doesn't replace the teacher-student relationship in a matter of trust and moral questions (Suzuki, 2023; UNESCO, 2021). AI Can't replace Human Teachers. Teachers have unique skills like: Emotional Intelligence and Creativity: Teachers can adjust based on students' emotional responses, something AI cannot do (Fink, 2012; Polanyi, 1966).

Ethical and Moral Guidance: Teachers play a crucial role in teaching values and resolving conflicts, areas where AI cannot operate on its own (OECD, 2019; UNESCO, 2021). Contextual Adaptability: Teachers can adapt their teaching to unexpected situations or in particular cultural contexts, which is something that AI cannot do (Wulf, 2013). The research question is why AI is needed but not able to replace human teachers. AI can make teaching more efficient by automating repetitive tasks and personalizing learning, but it cannot come close to the complexity and variety of human interaction. Teachers are essential for emotional, ethical and contextual instruction and that is necessary for

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education. To bring AI to education we should: Train Teachers: Teachers need to understand how to use AI thoughtfully & ethically, and take into account its benefits and disadvantages (ZawackiRichter et al., 2019). Encourage collaboration: AI developers and teachers must collaborate to create tools that are appropriate for the teaching environment (Baker & Siemens, 2014). It is imperative to prevent AI from exacerbating inequalities, especially in under-resourced areas (Çelik et al., 2021).

The best possible link between AI and teachers is to have few requirements. We refer to research for the following recommendations: Ongoing Teacher Training: To make the most of AI as a technology in learning and teaching, teachers should be educated on how it is being applied in the classroom and how it is taught. We will train teachers to not just use it as a technical tool but to think about how it is useful to education (Baker & Siemens, 2014). Technologists should be a part of AI tools and should be involved so that they are used for teaching and not just technical purposes. Ensuring Equity and Transparency: AI can lead to biases in education, so algorithms should be transparent and not further widen inequalities between students. Schools should put in place oversight to prevent biases around gender, socioeconomic status, or ethnicity, and also in the education system as a whole (O'Neil, 2016). Higher Education in Morocco: Some factors should be considered when using AI in Moroccan universities while respecting cultural and societal context: Adapting education to AI. Moroccan universities should incorporate AI within their curriculum as well as not only the technology-based fields, but also non-technical areas as well.

This prepares students for a world in which AI will be prevalent. The integration of education sciences, social sciences, and computer science into education programs in education, and in schools and universities could also be beneficial to the development of interdisciplinary programs that would foster a global and holistic and responsible use of AI in schools and universities (Zawacki-Richter et al., 2019). Infrastructure and Resources: Investment in technology infrastructure is the key to harness the power of AI in Moroccan universities, which need investment in the infrastructure necessary to make use of it: to open up the access to modern computing equipment, AI-based e-learning platforms, and ongoing training for teachers.

Reducing the Digital Divide:

A solution is needed to ensure that AI in education does not exacerbate the gap between wellresourced and under-resourced institutions. Access to technology across all parts of Morocco could make the use of these technologies a fairer one.

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Conclusion

I am convinced that AI can be used to improve higher education not only in terms of automation of tasks but also in terms of more personalized learning experiences. But we must bring AI into higher education in an ethical way that complements the role of the teacher. AI could also greatly improve the quality of higher education in Morocco if the level of education is invested in teacher training and fair technology use and Moroccan education is adjusted. For example, how educational institutions in Africa will use AI to support teachers in the future; and how in education can we give them tools and training while developing in the age of technology. In the future, policymakers should make sure that AI is not only making education better but also that there is still a human element in teaching. Declaration of Generative AI and AI-Assisted Technologies in the Writing Process. The author acknowledges using ChatGPT (OpenAI) to reformulate some sentences and translate some passages to improve writing quality, fluency, and readability. The tool was not used to create original content or conduct scientific analysis.

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