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STAGES OF TRAINING FUTURE TEACHERS IN THE ERA OF ARTIFICIAL INTELLIGENCE

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Annotation: Artificial intelligence (AI) is designed to create intelligent systems capable of performing tasks that are traditionally dependent on human intelligence. Its integration into the field of education is rapidly expanding, while creating both opportunities and challenges. Preparing teachers for this rapidly evolving technological change is critical to success, as education itself is not static. This position paper uses a methodology to synthesize the existing literature on innovative strategies for integrating AI into the training of Future Teachers. This paper presents the concept of Future Teachers, which addresses the challenges associated with the potential of AI to replace teachers. This article recognizes the role of teachers in providing emotional and moral support to students, as well as in developing critical thinking. It explores in detail the importance of AI for the effective use of AI in teaching and learning processes. Based on a literature review, strategies for training future teachers in the era of artificial intelligence can be implemented by adopting approaches such as developing artificial intelligence literacy, integrating artificial intelligence into teacher training courses, encouraging collaborative learning among teachers, offering lifelong learning opportunities, and fostering a positive attitude towards the use of artificial intelligence. The article proposes, among others, that future teachers should receive basic training on the use of artificial intelligence in teaching and learning processes within the framework of teacher training programs offered by teacher training institutions.

Keywords: Artificial intelligence, artificial intelligence integration, innovative strategies, future teachers, teacher training.

Artificial intelligence (AI) refers to the field of computer science devoted to creating intelligent machines capable of performing tasks typically associated with human intelligence. AI systems rely on algorithms and statistical models to interpret data, identify patterns, and make predictions. AI is often divided into two categories: weak or narrow AI and strong or general AI. Narrow AI is designed to perform a specific task, while general AI seeks to mimic human intelligence and consciousness. AI encompasses a variety of subfields, such as machine learning, natural language processing, computer vision, and robotics. Machine learning is a branch of artificial intelligence that allows machines to learn and improve their abilities through experience without the need for explicit programming instructions.

Natural language processing is concerned with teaching machines to understand and respond to human language in a natural way. Computer vision is concerned with enabling machines to interpret and analyze visual data, while robotics involves creating intelligent machines that can interact with their environment [7]. The rapid development of artificial intelligence technology has led to its integration into many industries, including manufacturing, entertainment, finance, healthcare, telecommunications, transportation, agriculture, and education. The integration of artificial intelligence into education has the potential to revolutionize teaching and learning by enabling personalized learning experiences, more

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effective assessment and evaluation, and improved student engagement. It has the potential to help educators tailor their instruction to individual student needs and provide real-time feedback to help improve student learning outcomes.

In addition, AI can automate many of the administrative tasks that teachers face, freeing up their time to focus on delivering high-quality education. AI can also address some of the challenges facing education, such as the need for lifelong learning and the growing demand for upskilling and reskilling in the workforce. The potential of AI to deliver personalized learning experiences and improve access to education. As AI technology evolves and becomes increasingly accessible, it becomes increasingly important for teachers to understand the importance of AI in education and embrace its potential benefits. The transformative potential of AI in education, offering personalized learning, improved feedback mechanisms, and automation of administrative tasks, underscores the need for teachers to adapt and leverage these opportunities.

This article examines the importance and strategies for preparing future teachers to teach and learn with the integration of artificial intelligence. Artificial intelligence has the potential to transform the way teachers teach and students learn, enabling personalized learning experiences, more effective assessment and evaluation, and increased student engagement. As a result, there is increasing attention being paid to preparing future teachers to effectively integrate artificial intelligence into their teaching practices. Recent research has also highlighted the importance of artificial intelligence in teacher training. For example, a study by found that integrating artificial intelligence into teacher training can improve teachers' abilities to personalize learning experiences, create more effective assessments, and engage students in more meaningful ways. Similarly, another study by found that AI can help teachers identify struggling students early, implement targeted interventions, and ultimately improve student outcomes.

In addition, according to , AI also plays a significant role in addressing the challenges posed by the COVID-19 pandemic. The shift to distance learning has highlighted the need for innovative solutions that can help teachers deliver high-quality instruction in a virtual environment. AI-powered tools such as chatbots and adaptive learning platforms can help facilitate distance learning and provide personalized support to students. One of the benefits of AI in teacher training is the ability to personalize learning experiences for individual students. AI technology can be used to analyze student data and provide personalized recommendations and feedback to help students achieve their learning goals. Using AI-powered tools, teachers can create personalized learning paths for students based on their individual learning styles and needs. AI can also help improve the efficiency and accuracy of assessment and evaluation. AI-powered assessment systems can provide grades that are as accurate as those provided by human assessors, while being more consistent and efficient. By automating assessment tasks, teachers can save time and focus on delivering high-quality instruction. In addition, AI can help improve student engagement by offering interactive and immersive learning experiences. For example, AI-powered chatbots can be used to provide personalized support and guidance to students, while virtual reality (VR) technology can be used to create immersive learning environments. There is also a growing demand for teachers skilled in the use of AI technologies. AI skills are becoming increasingly important in the workforce, and AI-skilled teachers can help bridge the gap between what is currently in high demand, i.e. 21st century skills, and the skills taught in schools.

The potential for AI to replace teachers The question of whether AI will replace teachers is a hot topic in the field of teacher education. While some argue that AI has the potential to improve teaching and learning experiences, others are concerned about the impact of AI on the

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teaching profession. One argument in favor of AI is its potential to personalize learning experiences for students. AI-powered learning platforms can adapt to the unique needs of individual students and offer personalized feedback, thereby creating a more engaging and effective learning experience. In addition, AI can help reduce the time and resources needed for assessment and evaluation, allowing teachers to focus on more interactive and collaborative classroom activities. However, there are concerns about the impact of AI on the teaching profession. One of the main concerns is the potential replacement of teachers, which could lead to job losses for teachers. This raises questions about the potential drawbacks of AI in education, such as the role of teachers in the classroom and their ability to provide personal contact and emotional support that AI may not be able to replicate. There are also concerns about potential biases and inaccuracies in AI algorithms. If AI-powered learning platforms are not properly designed and monitored, they could perpetuate biases based on race, gender, and socioeconomic status. Furthermore, AI may not be able to replicate the creativity and critical thinking skills needed for teaching.

Another concern about AI replacing teachers is the potential for the loss of social and emotional interactions between teachers and students.

In addition, teachers play a critical role in identifying and addressing students' mental health issues, which AI may not be able to do. The use of AI in education also raises questions about the quality of the content being taught. While AI can offer personalized learning experiences, there is a risk that students will only learn superficially without deep understanding or critical thinking skills.

Given these concerns, it is unlikely that AI will completely replace teachers, but it can enhance and enhance their role in education. Therefore, it is important for teachers to be educated on AI technology and its ethical and responsible use, which is essential for effectively harnessing its benefits. Teachers can use AI to improve their teaching practices, for example, by using AI-based analytics to track student progress and adapt teaching approaches. Accordingly, it is important for teacher education programs to integrate AI-focused coursework and training into their curricula, ensuring that future teachers have the skills and knowledge needed to effectively use AI in their teaching practice.

While AI has the potential to revolutionize education, it is unlikely to completely replace teachers in the classroom. The role of teachers in providing emotional support, personalization, and creative and critical thinking skills is crucial in the classroom. However, it is important that future teachers are trained in AI technology and integrate it into their teaching practices in an ethical and responsible manner.

The term "future teachers" refers to a new generation of teachers who are equipped with the multifaceted skills to cope with the complexities of modern education. "Future teachers" are not only adept at integrating new technologies such as AI into teaching practices, but also act as important bridges between schools, students, and parents. In fact, they play a key role in shaping students' existential identities in educational and social contexts. Other scholars also see future teachers as being flexible in evolving education systems and committed to personalized learning experiences for students. They have the technological knowledge necessary to effectively use AI and other technologies, which increases teaching effectiveness and student engagement.

In addition, the Future Teacher must possess a variety of skills beyond technological proficiency. These include critical thinking, problem solving, collaboration, creativity, communication, and deep subject matter understanding. In an increasingly globalized and technology-driven world, the Future Teacher faces new challenges and opportunities. As such,

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they must navigate the intersection of pedagogy and technology, while also serving as advocates for the emotional and social development of students. Future teachers are prepared to shape the educational experiences and outcomes of future generations by embracing their roles as teachers, leaders, and facilitators of learning. Future teachers must be flexible and adaptable, constantly seeking the best technological advances to improve teaching practices and achieve educational goals. They must also be vigilant in combating widespread threats such as cyberbullying and fake news, and use technology to verify sources and foster critical thinking among students. In addition, future teachers should use technology to make learning more interesting and interactive, and use vibrant educational technology tools to attract students' attention and interest in learning. Future teachers should have the necessary knowledge, confidence, belief and culture to accept and implement new technologies, he emphasized. Thus, the future teacher embodies a comprehensive approach to education, integrating new technologies, developing emotional intelligence and having a variety of skills to meet the needs of different students. Therefore, in the training of future teachers, it is very important to include courses that improve their skills in using new technologies, thereby preparing them to effectively integrate innovative tools and methods into the teaching and learning environment, ultimately preparing students for success in the 21st century.

A review of relevant literature was conducted, focusing on scholarly work and research related to the integration of AI in education. This review provides the key information and evidence to inform the paper's position. After reviewing relevant literature, innovative strategies are presented in the form of results and a discussion of the effectiveness and feasibility of these strategies. Based on the results of the literature review, the synthesis of the collected information served as the basis for creating a narrative that supports the paper's position on strategies for preparing future teachers for the challenges and opportunities presented by AI. This synthesized literature helped to inform the proposals presented in the paper.

Incorporating AI content into existing teacher training courses ensures that AI concepts are woven into the structure of the curriculum, rather than being treated as stand-alone topics. This approach allows teacher trainees to see how AI is interconnected with other aspects of teaching and learning, such as curriculum design, assessment, and classroom management. Designing specialized modules or practicum experiences focused on AI integration provides opportunities for teacher trainees to apply AI concepts in real-world educational contexts. These modules may include designing AI-enhanced lesson plans, implementing AI-powered adaptive learning systems, or analyzing student data to inform instructional decisions. Collaborative projects between teacher trainees encourage teamwork and innovation while addressing real-world educational challenges related to AI integration. These projects may involve interdisciplinary teams working on AI-based research initiatives, curriculum development projects, or plans to integrate technologies for school-wide implementation.

Encourage collaborative learning among teachers. Creating peer learning communities within teacher education programs creates a supportive environment where teacher trainees can share ideas, resources, and experiences related to AI integration. These communities can take the form of study groups focused on AI in education, online forums, or professional learning networks. Pairing teacher trainees with experienced teachers who have experience in AI integration can provide valuable mentoring and guidance. Mentoring programs can include one-on-one coaching sessions, classroom observations, or collaborative lesson planning activities focused on the effective implementation of AI technologies. 36 noted that the formation of practice research groups within teacher education programs would allow teacher educators to

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conduct systematic research on the impact of AI on teaching and learning outcomes. These groups could collaborate on research, collect and evaluate data, and disseminate their findings through presentations or publications.

These workshops could cover topics such as emerging AI tools, data analytics in education, and the ethics of using AI in the classroom. Establishing virtual training groups for teacher educators would facilitate ongoing collaboration and knowledge sharing on AI integration. These groups could use online platforms, webinars, and discussion forums to connect practitioners and teacher educators from different geographic locations and provide peer support. Developing an advanced certification program in AI integration for teachers would provide opportunities for professional growth and recognition. This program may offer specialized coursework, hands-on training, and assessments designed to validate teachers' competency in AI-enhanced teaching practices. This may include highlighting success stories through awards, testimonials, or professional publications that demonstrate the transformative impact of AI on teaching and learning. Hosting community development events, such as AI expos or innovation fairs, brings educators together to share their experiences and celebrate achievements related to AI integration. These events provide a platform for networking, collaboration, and peer recognition, fostering a sense of community among educators committed to advancing AI in education.

In conclusion, the education sector, like other sectors, is expected to witness an increasing reliance on AI technology as such teacher training institutions need to prepare teachers to succeed in a rapidly changing world by equipping them with the skills and knowledge needed to effectively use AI. This position paper argues that while AI has the potential to revolutionize education, it is unlikely to completely replace teachers due to their central role in providing emotional and moral support, as well as in developing critical thinking among students. However, to effectively harness the benefits of AI in education, future teachers will need to embrace new technologies such as AI literacy. This can be achieved by integrating artificial intelligence into teacher training programs, which can be achieved by implementing strategies such as developing artificial intelligence literacy, integrating artificial intelligence into teacher training courses, developing collaborative learning in teacher training, providing continuing education opportunities, and forming a positive attitude towards the use of artificial intelligence.

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