

# *Exploring the Impact of Artificial Intelligence Development on the Teaching Profession*

Yi An

*St. John Bosco High School, Bellflower, USA*  
*y.an26@bosco.org*

**Abstract.** The fast emergence of AI usage in education has provoked huge discussions on the role AI is playing in teachers' careers and practices. Despite AI's field improvement and personalized learning, it is widely believed that this technology may provoke educational inequality, harm teachers' autonomy, and undermine the human aspect of the teaching process. The current investigation expounds on two clashing views regarding AI's role in education by providing arguments of its dangers, such as algorithmic biased thinking and overreliance, and of its high capacity in vocational training and resource enhancement. With the help of a systematic literature review, the research integrates scholarly arguments and empirical evidence from key sources to draw a conclusion on the tensions between the use of technological tools and the educational process driven by values. It is discovered that AI's merits are overturned by its challenges, which include the "Matthew Effect" in the distribution of resources and the gradual loss of teachers' agency. The study reports a view suggesting that a balanced, symbiotic type of relationship, namely where AI approaches the standardized tasks behind a teacher's back while teachers focus more on guiding ethical practices and developing critical thinking among students, is necessary to curb AI's negative impact without losing the integrity of education. Suggestions include institutional measures against prejudices, digital competences incorporation into professional teacher training, and multilevel AI introduction strategies to replace human pedagogical functions.

**Keywords:** Artificial intelligence, teacher professional development, educational equity, human-ai collaboration, algorithmic bias.

## 1. Introduction

Education faces continuous transformation, with deepening integration of artificial intelligence in teaching and learning in the last years (research background). This revolution brims with challenges such as personalized education and better efficiency of teaching; however, it also raises profound debates between questions like educational equity vs teachers' autonomy as well as teaching humanistic values in schools. The study is ultimately aimed at disclosing the ambivalence of AI technology's impact on teachers' professional development, which assumes revealing the dialectical correlation between the true nature of education and the phenomenon of technological empowerment (research background).

This research provides a theoretical as well as practical basis for the digital transformation of education (research significance). It helps understand the changes underlying teachers' competencies requirements in the AI generation in theory and provides practical insights into educational institutions when working out the AI implementation in teacher training programs and the corresponding policy. Technology of digital education is stimulated on a global scale by intensifying digital strategies; however, maintaining a balance between effectiveness and values in education becomes a pertinent challenge (research significance).

The article particularly emphasizes three areas (research theme): namely, the first looks into the dual roles of AI in amply enhancing and limiting teachers' instructional ability; the second focuses on how algorithm bias and other technology threats may squeeze educational equity; lastly, human-AI productive approach construction is presented.

The research method in this study involves a systematic analysis of literature materials (research method). Through databases like Web of Science and CNKI, we observed a multitude of articles published from the years of 2018-2025 with the keywords "AI + education" and "teacher professional development + technology," leading to a qualitative content analysis as the articles were coded categorically. Compared with a conventional approach, the strengths of this method include the ability to bring to light the development of discussion, how different approaches concur, and in what direction they diverge from each other, and it provides recommendations for creating a theoretical model (methodology).

The ultimate research objective is to form a three-dimensional model of technology-competency-ethics integration to develop the professional capabilities of teachers in the AI era (research objective). To do this, a three-stage literature review was used, where current technology implementation was mapped in the first phase, issues were extracted in the second stage, and practical advice was summarized in the third. In this way, the study is able to guide theoretical innovation while at the same time providing practical advice that helps realize these concepts (research process).

## 2. Literature review

The intensive incorporation of artificial intelligence in education has completely changed nature, and the teachers' role is left to its professionalism and skill set. In today's academic dialogue, the opinions of teachers' professional roles and competence requirements are fundamentally different.

Critical scholars, however, assert that the use of AI depicts a serious threat to the core, or humanity, of education. The proponents of algorithmic educational inequality suggest that the Matthew effect may happen, where the technologically advanced regions may suffer deprivation in the digital era, while the old or under-resource areas will lag behind. Automated lesson planning, they say, will mechanize the task and reduce it to generic templates, which will eventually deprive the teachers of creativity and instant engagement with students. The most worrisome scenario is that of dependence, which leads to AI outputs being considered unquestionable pieces of information, with IA homogenizing the instructional approaches and basically reducing teachers to instruments, resources, and not professionals who make judgments. This position, indeed, gives priority to the personalization and humanity of techno didactics. Meanwhile, the enthusiastic researchers highlight AI's potential as one of the driving forces in vocational education to revolutionize the concept of job preparation. To these students, AI metamorphoses the teacher's role from a transmission of knowledge to a constructor of thinking paths. Here, AI does not just deliver data but instead empowers cognitive analytics in real time, making personalized learning possible. The virtual physical integrated environments have conquered the traditional classrooms, going beyond the

subjective skill assessment and moving to the precision based on the data. Generative AI radically changes the manner of resource conservation; it retains the pooled global inputs to reframe a previously non-contentious subject like politics to become a discussion forum. Particularly, by taking care of routine, such as grading, AI frees teachers from monotonous work to engage in more complex activities like guiding and value-based teaching. This ideological conflict, as mentioned, reflects a more profound tension: on one side, the campaigners are keeping the core of education, its heart and soul, untouched, while the other side is changing the methodology of education through technology. The very point marks the way forward: creating a scenario where collaborative tasks are shared between AI and humans, the former taking standard methods while the latter being ethical discerners, creative pedagogues and depth in terms of relationships. Conclusively, intentional symbiosis is the only way through which education can advance without sacrificing its essence, which is the human factor.

First, as "Ethical Concerns and Governance Strategies of AI Integration in Higher Education" criticizing the erosion of educational equity, subjectivity and privacy rights by AI technology, the core starting point lies in the structural conflict between the instrumental rationality of technology and the value rationality of education. The original intention of embedding artificial intelligence tech in higher education was to promote educational inclusivity through technological empowerment, however, in practice, the uneven distribution of technology and structural differences in the capabilities of stakeholders have instead given rise to new challenges in educational equity [1]. The envisaged boost to education equality brought by the ability of AI technologies was supposed to occur. However, in reality, the inequalities it causes tends to increase. Based on the Matthew effect, developed regions retain the aircraft of technological advantages, whereas the developing areas struggle with groundwork and digital dimension. There are algorithm biases that increase social stratification when poor people are directed towards off-sourcing, cheaper learning means. Thanks to commodifying education, the root cause is disregarding the values of fair education and putting more focus on technical efficiency. No less than creating compensatory technology mechanisms, securing algorithm appraisal, and bettering digital competences go hand in hand to progress genuinely educational tech equity. The other point says that "The intelligent lesson preparation system reduces teaching plans to standardized template combinations, compressing teachers' pedagogical expertise into algorithmically recognizable operational commands. This technological substitution risks a dual weakening of teaching capabilities: excessive reliance on AI recommendation systems may erode educators' professional capacity for autonomous instructional design, while efficiency-driven evaluation criteria obscure the emotional dimension of teacher and student interactions." [1]. AI-based teaching planners make learning easier but cast some doubt. Their excess entrenchment into these pedagogic areas may deplete the imagination and the personalized design skills of their users. The system prioritizes measurables and produces a risk of missing out very vital non-measurable factors, like tutelage-student presentation. Still, unlike this automated technique, which could lead to mechanization of education, find a balance between technology in education and keeping the humanistic approach alive. "While artificial intelligence provides precise recommendation information for teaching, it also triggers a spiritual-level technological dependence. Blindly regarding the knowledge automatically generated through neural network algorithms as "divine oracles" will lead to the vulgarization of teachers' teaching thinking and the dulling of their morality. Existing research has shown that intelligent teaching intervention can cause a decline in teachers' lesson preparation ability, thereby increasing the tendency towards homogenization." [2]. AI, in the education field, optimizes efficiency, but overdependence weakens teachers' creativity and critical thought. Prolonged usage of AI tools affects educators' lesson

planning skills, which causes conformity in the teaching process. Important beliefs of education originate in the inspiration of minds and values, which nobody but humans can do. AI should only support and not be the substitute for teachers. It is our responsibility to integrate technology and human wisdom in a way that does not compromise quality and personalization of education. Teaching in a real sense entails the above-mentioned balance between digital instruments and human wisdom.

At the last, the training of artificial intelligence relies on a large amount of data. If the training data is biased or contaminated, it will lead to cognitive biases in the content generated by artificial intelligence [3]. The prevalence of artificial intelligence for teaching affords the review of its benefits and challenges primarily on content quality and neutrality of AI-generated resources. AI systems are trained, using large datasets, and therefore, for this reason, a dataset that carries biases or errors can result in the generation of skewed or erroneous educational resources. For example, if culturally or historically incomplete data or biased information is the source of training the AI, the content AI will produce, such as lesson summaries, case studies, or exam questions, may result in stereotyping or one-dimensional views. It poses an adequate challenge for teachers using AI tools for lesson planning or sourcing additional materials. Problematizing such risks will require educators to examine AI contents critically, i.e. evaluate information instead of taking it for granted. Professional development classes ought to instruct teachers in spot biases of AI-generated content outputs and then double-check all important facts against trusted resources. In addition, schools and e-tech providers should place the emphasis on transparency of the training datasets and algorithms, and regular audits should be carried out to check fairness and accuracy of these algorithms. Since the combination of the efficiency of AI with the supervision of teachers brings the benefits of technology into the classrooms without compromising the need for educational integrity, AI essentially has to act as an aide to the teacher's expertise and the teacher's judgment.

The other stance of artificial intelligence being positive, "Intelligent Education Synergy: The Transformation of Vocational Education Teaching in the AI Era", taking vocational education as the scenario to empower teachers' capability transformation are proposed [4]. The core starting point lies in the fact that technology serves as the inherent driving force for educational reform. "The role of teachers is transforming from knowledge transmitters to cognitive architects. Artificial intelligence profoundly empowers the traditional knowledge delivery process in teaching, enabling precise analysis of knowledge graphs and real-time diagnosis of learning trajectories through algorithms, which fundamentally reshapes the teacher's role." AI is transforming teachers from "knowledge transmitters" to 'cognitive architects.' [4]. This transition mandates teachers to construct pedagogical pathways and scaffolds as opposed to simply distributing knowledge. AI assists in the elucidation of knowledge graphs and learning paths so that personalized teaching is enabled. Nevertheless, this necessitates that educators be up-to-date with the newest technologies while ensuring continuity of the very essence of education. The essential part is to combine the applications of AI technology with the educational formula so that AI becomes an assistant and does not assume the consultant role. The other important point is "The integration of technologies has established an educational infrastructure supporting lifelong learning, extending the educational space from fixed locations to ubiquitous scenarios. The deep convergence of physical and virtual spaces has transformed skill development from vague empirical judgments to precise data metrics, significantly enhancing the effectiveness of skills training. This transformation promotes dynamic alignment between talent development and industry needs, forming an intelligent 'teaching-practice-feedback' closed loop that expands the practical horizons for teachers' professional advancement." [4]. The use of technology allows learning to take place anywhere, integrating online and offline. Data makes communication

in teaching very specific, and it is a departure beyond experience. The age-old "learn-teach-practice" cycle ensures that the industry's needs are met, and it also strengthens the teachers' work by providing them with opportunities. However, they will have to skill up in digital teaching procedures. Also, generative AI possesses remarkable capabilities in information integration and content generation, enabling teachers to access vast and engaging teaching materials. For instance, when guiding students to study current political affairs, educators can utilize generative AI tools to quickly obtain global documents, the latest related news, in-depth analytical reports, and multi-perspective commentaries. These diverse and abundant materials significantly enrich classroom teaching content, while transforming ideological and political education from monotonous to dynamic and vivid. This approach allows students to further enhance their understanding and comprehension of ideological and political knowledge [5].

### 3. Analysis

Generative AI brings three significant enhancements to ideological and political education: first of all, the online platform, with a powerful information integration capability, breaks the temporal and spatial limits of traditional teaching materials, so that the global real-time current events and diverse viewpoints can be immediately accessed, and the teaching content is always synchronized with the times. Secondly, thanks to the function of generating an in-depth, detailed report as well as a multi-perspectival interpretation, this technology is capable of turning the abstract political theories into concrete case studies, thus bridging the gap between traditional political research and the public. Finally, it is the cornucopia of materials that have been developed using AI that enables teachers to utilize a more personalized methodology to help students learn with different learning contexts in the classroom, including multimedia presentations that generate greater emotional engagement among Generation Z students. Then, as the positive side of using AI, generative AI technology can achieve automatic marking and objective assessment. By analyzing students' homework, quizzes, and exam answers, it can evaluate students' mastery of knowledge and learning progress, thereby enhancing the accuracy and efficiency of course assessment and reducing teachers' workload [6]. Generative AI applied in educational assessment technology is changing teaching evaluation systems. Grading papers and homework, as well as analyzing learning advancement, are tedious tasks that can be delegated to artificial intelligence, which intuitively uses its natural language processing algorithms for these exact purposes. The main asset lies in allowing the teacher to leave tedious work behind and focus on instructional content and personalized coaching. Efficiency in routine assessment, expansion of diagnostic dimensions, and improvement of feedback precision are the keys to central advantages. While automated evaluation can provide accurate scoring, it may impede the capacity of teachers to interpret atypical answers and dynamically observe the learning process through automation. To foster a successful relationship between humans and AI in education, new scholarly practices impose a conceptual framework: AI marks assessment, while a teacher acts in the place of educational-evaluative judgment and the learning process. The central point here is to devise the "AI scores less and recognizes trends; the human makes recommendations about emotional analysis, educational level, and cultural understanding." On the one hand, boosting the teachers' digital literacy with respect to data evaluation and technology integration is crucial. On the contrary, this reorganization reflects not a technical replacement but a simplified, well-planned restructuring of the evaluation process. In the coming period, artificial intelligence will remain as an assistant tool in the classroom, whereas authentic teachers with an educational sense, expertise, and humanity will be the primary agents that will guarantee the integrity of assessment in schools. The best academic assessment system should both naturally blend the technologies and humanistic

approaches, which will allow the quantitative objectivity and qualitative depth to be operated in sync and ultimately serve the holistic development of students [7].

#### 4. Practical suggestions

The effects of AI on the professional development of teachers are characterized by its field-specific aspects: In the fields where teaching is standardized, AI technologies increase efficiency, from assessment automation, resource generation, and learning diagnostics to release the teachers from mechanical routines [8]. Contrarily, when it comes to value-based domains of teaching, AI has limitations due to algorithmic bias in ethics principles, issues relating to critical thinking become tougher to overrule when the responses from the AI are pointedly templated, and to give personalized feedback Teacher's emotion cue is fundamental majority of the time, creating an insurmountable frontier to AI. Successful AI integration hinges on dual regulatory mechanisms: Teachers must improve their digital literacy to audit algorithmic biases and take a leadership role in adapting the output from technology, whereas educational institutions should create clear oversight guidelines and permit AI task assignments to human teaching professionals, especially in places where technical solutions are crucial [9]. Practically, a tiered implementation strategy is essential: Teachers will still hold the power of moral guidance and interpretation, while AI will take up objective assessments and provide basic resource support, yet the idea of creating collaborative procedures, where AI preliminary screening occurs, followed by teacher refinement, at any checkpoint, has to be established. This system, in a way, helps to avoid the pedagogical skills degeneration through the technology overreliance and ensures that teachers' transition into the role of cognitive machine with a humanistic touch would be the way to go in the future, thus striking a balance between the infallibility of technological innovation and the irreplaceable essence of humanity that education upholds.

#### 5. Conclusion

This shows the results that shed light on the two-sided nature of AI in teaching. AI has the power to make work easier, and at the same time, it can reduce teacher autonomy and equity. These conclusions highlight the fact that the integration of technology in education is both possible and involves a trade-off between its strengths and making prudent choices. AI needs to be treated more as a helper for teachers to eliminate repetitive tasks so that educators can concentrate on the vital skills of critical thinking and the provision of ethical guidance. The Technology-Competency-Ethics framework is suggested as the model that presents the scope for collaboration.

Through this lens, the policymakers have to respond to the demands of governance systems, which in turn, address the various concerns of algorithmic bias and provide equitable access. Whereas digital literacy is an important skill that teachers should develop to take advantage of AI approaches without affecting pedagogical integrity, future studies should consider the long-term effects, application beyond this context, and AI ethics design for education.

Finally, the way ahead sits in the collaboration between AI and human intelligence, leveraging the advantage from technology while retaining the mainstay of education, which is humans. AI augmentation should not be the replacement of teachers but rather the improvement of their abilities so that technology can grow into a worthy addition to the standoff. Keeping on with research and discussion will be vital for responsibility management of this evolving layout.

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