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Editorial

Artificial intelligence, the new trend and challenge of education

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Artificial Intelligence (AI), first proposed at the Dartmouth Conference in 1956, has achieved remarkable achievements with near 70 years' development. With the continuous development of AI, especially the rise of generative AI (GAI) since ChatGPT, also called Large Language Models (LLMs), it has transformed educational landscapes globally [1]. Recently, the integration of AI/GAI in education (AIED) has become focused point, mainly introducing AI to create better personalized learning experience, propose adaptive assessment methods, and construct human-like tutoring systems [2]. In the future, AIED is expected to further promote the digital and intelligent transformation of education.

The huge advantages of AIED for learning and teaching have also received increased attention, and are fast becoming hot topics in social debates. While AI has great potential to promote personalized and high-quality education, it brings many challenges to research. For example, research on AI algorithm is required to recommend better content and personalized services for learners; research on instructional paradigms is required to provide optimizer education processing for classes; research on effective AI applications is required to assist instructional plans and generate instructional resources for educators more comfortable. All these AIED domains are required to deeply study. Now, many researchers have worked deeply in this interesting area.

Recently, Zhang et al. proposed a method for developing the recommendation models based on LLMs [3]. The key idea of method was that the preferences or needs of a user could be expressed in natural language descriptions (called instructions), so that LLMs could understand and further execute the instruction for fulfilling the recommendation task. The results showed that this method contributed to develop more user-friendly recommender systems. Song et al. proposed a customized role-based agent (CRBA) to automatically criticized and optimized the LLM's intermediate outputs for generating better instructional plans [4]. The results showed that the LLM-generated instructional plans based on CRBA had comparable performance to man-made ones. Zhang et al. proposed a multimodal reasoning and fusion model based on GAI to generate more accurate answers and explanations [5]. It consisted of Multi-Graph Reasoning and Fusion (MGRF) layer and explanation generation module. The results showed that the proposed model improved the accuracy and interpretability of the information processing process.

Despite these advantages, AIED brings many negative influences, such as ethical and societal issues. For example, over-reliance on AI risks weakens critical thinking and foundational study skills of learners, as well as personalized instructional plan and deep-thinking skills of educators; generated AI (GAI) brings academic dishonesty and

plagiarism, hallucination and bias of GAI aggravates untrustworthy of GAI and required to develop interpretability and transparency of AI decision-making; ethical use of generated data in education, and the prevention of AI from perpetuating existing digital divides are also the most urgent concerns [6,7].

Many researchers have done some work to solve the above problems. To reduce the negative influence of using AI on the critical thinking of teachers and students, Danry et al. proposed the AI-framed Questioning [8]. It turned information relevant to the AI classification into questions to actively engage users' critical thinking and scaffold their reasoning process. Then results showed that the AI-framed Questioning significantly increased human discernment of logically flawed statements. Then, Antoniou et al. proposed a teaching method to improve students' critical thinking skills when using AI [9]. This method involved learners being given a structured assignment that required them to use ChatGPT to write a report and a critical analysis of the output. To improve interpretability and transparency of AI model, Wang et al proposed a method of applying the Chain of Thought (CoT) to deconstruct the decision-making chain of the AI model [10]. Experimental results indicated that the proposed method improved the transparency and interpretability of the intention reasoning process. Zhu et al. proposed a novel dynamic Retrieval-Augmented Generation (RAG) framework for generating more accurate and relevant content [11]. The results showed that this framework dramatically improved the inference accuracy and reduced the generation of hallucinations during the text generation process of LLMs. Since everyone had equal access to AI (GAI) technology, which was crucial to prevent a digital divide. Most researchers proposed the integration of AI (GAI) technology into the basic curriculum to ensure that every student had equal access to (GAI) technologies, thereby reducing the digital divide [12].

In the era that AIED has become the focus of numerous studies, *Artificial Intelligence and Education*, a new open access journal, provides a global platform for peers with interests and activities spanning the cross-disciplinary disciplines of AIED. The platform enables authors and readers to communicate their research on innovative technologies, theories, practical applications, and critical discussions for sustainable development of this novel and promising domain. This journal will publish original research articles, comprehensive reviews, and short communications covering a wide range of topics in AIED, such as AIED in K-12 education; AI/GAI tools in education; New theories, models, frameworks or technologies for integrating AI/GAI into education; AIED in informal learning; LLMs in AI assisted learning and teaching; AIED application in promoting process-oriented and adaptive assessment; AIED application in promoting personalized learning; Intelligent tutoring applications or systems; Typical cases and efficiency analysis in AIED; Security and privacy protection in the use of AI in education; Ethics and policy in the use of AI in education.

Artificial Intelligence and Education aims to become a leading international journal publishing the highest quality original contributions on the latest developments, where each article will make a clear contribution to the development of innovative, ethical, and scalable AI solutions for education. By focusing on these areas of research and encouraging the publication and dissemination of such studies, this journal will promote and enhance research in this cross-disciplinary disciplines of AI and education. We welcome manuscript submissions of high-quality, innovative

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