ChatGPT in Higher Education: Towards the Future of Technology-Facilitated Learning

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Abstract. The world is gradually transitioning to an intelligent digital age these days, and ChatGPT's artificial intelligence is always improving. Through extensive textual data analysis, ChatGPT is able to produce natural language, respond to a range of queries, and deliver pertinent information. With its robust features, ChatGPT is currently being used extensively in the field of technology for chatbots, virtual assistants, automated response systems, and other applications. It has also been utilized extensively in higher education. ChatGPT has been instrumental in advancing the digital transformation of education in schools. It gained prominence in the field of education and garnered significant interest from the academic community. It also presents opportunities and some problems to the higher education sector at the same time. Based on this, the application of ChatGPT in higher education is used in this article to contextualize the trend of educational digitization. It then goes on to explore the obstacles, opportunities for future development, and appropriate actions that ChatGPT is now facing in higher education. It looks at a variety of topics, including instructional modalities, fields, and objects, and offers advice on how to incorporate ChatGPT into currently available educational materials to increase student learning effectiveness. There is a certain reference value and relevance to this kind of digital education.

Keywords: ChatGPT, artificial intelligence, high education, technology-facilitated learning.

1. Introduction

With the ongoing iteration of artificial intelligence (AI), the launch of ChatGPT has triggered tremendous challenges and revolutions worldwide, including in education. ChatGPT, a conversational model developed by Open AI, is believed that with widespread use will have a profound impact on the existing education environment. The ongoing changes in the educational scene suggest that there is a growing need for cutting-edge learning resources, which is a problem that affects people all over the world.

ChatGPT, with the capability to generate human-like responses which represents a remarkable advancement in Natural Language Processing (NLP) technology, could be one feasible way to transform the traditional way in which students and educators interact with education resources. Karaköse and Tulubas stated that with appropriate guidance, ChatGPT could be put into practice to promote the development of 21st-4C skills, listed as collaboration, communication, critical thinking, and creativity [1]. These are the required qualities for college students who will gain benefits in their future careers. In addition, Chan and Hu discuss that Generative AI (Gen AI) in higher education is plausible to enhance students' original output by giving practical prompts [2]. In other words, Gen AI such as ChatGPT, could provide clear clues to students and stimulate their creativity and as a result, learning efficiency and learning experience could be significantly improved through the proper use of Generative AI. Despite the benefits which Artificial Intelligence could bring to the existing education landscape, potential risks should also be accessed. Lack of personal viewpoints which AI cannot produce and inappropriate references could lead to barriers to the development of writing skills especially for those second language learners who have difficulties constructing proper prompts [3]. It can be indicated that the over-reliance on generated AI without proper guidance and personal

feedback could probably contribute to negative impacts on individualized progress. Apart from this, Zhai argues that the widespread use of text-to-text generators may cause injustice in the effectiveness of assignments and eventually threaten academic integrity in higher education [4]. On top of that, Sebastian emphasizes the significance of privacy in the context of using student data when interacting with ChatGPT, AI generator users should raise self-protect awareness and mitigation strategies [5].

Facing the rapid iteration of Artificial Intelligence, these evaluated concerns or risks are fairly convincing and reasonable since relevant regulations and monitoring methods have not been established. Recently in October, the Australian education minister approved the framework for Generative Artificial Intelligence which will officially implemented in term 1 2024, aiming to provide guidance on understanding, and using the responses to generative AI in Australian school-based education [6]. This can be considered the first formal range practice for ChatGPT integrated into the higher education landscape. Nowadays, ChatGPT is gradually being widely used in various universities, providing course design for teachers, guiding students in paper writing, and assisting in teaching. However, without proper guidance and regulation, there are also situations such as opportunism and extensive plagiarism in this regard, and ChatGPT is not yet fully mature, which still needs to be solved. In this case, through examining existing literature and conducting empirical research, this study aims to provide suggestions on how to integrate ChatGPT into existing education resources and enhance students' learning efficiency.

2. Digital Technology and Educational Challenges

2.1. Integration with Traditional Teaching Methods

The traditional teaching method is for teachers to give lectures and help students solve their problems. The teachers will have a focus in their lectures, and most of the class is based on the teacher's output, lacking the output of the students. However, due to the long-term use of traditional teaching methods in the teaching industry, students have become familiar with the teaching mode of their own teachers and can quickly adapt to their teaching mode in the new environment. ChatGPT has been an emerging tool in the past two years. Firstly, it is difficult for teachers to apply teaching resources due to a lack of understanding, especially for older teachers. Secondly, the technology is not yet mature enough, and the accuracy of data still needs to be improved.

However, there is a great trend in future education to shift from traditional knowledge-based teaching methods to questioning-based teaching methods, which is an era centered on active learners. The teacher stands on the podium to give a lecture, while the students listen below and receive the teacher's signal, which is passive learning. On the contrary, when students ask questions to ChatGPT, they are guided by their own thinking, which is completely proactive learning. In the era of GPT, the ability to ask questions will be infinitely amplified, so in the future of teaching, integrating ChatGPT into teaching is also a trend. The intervention of ChatGPT will inevitably disrupt traditional teaching methods and lead to the alienation of teacher-student relationships. Ding and Lv also believe that the main way of classroom teaching in the future will be problem-oriented research-based learning [7]. Compared to teachers, GPTs with powerful databases have more advantages and can provide more advantages for students' learning. However, it is undeniable that ChatGPT cannot replace teachers because it does not provide the unique humanistic care and emotional interaction between teachers and students.

2.2. Improving Student's Learning Efficiency and Quality

ChatGPT can make personalized plans and tutoring based on the different characteristics of each student, better serving them and making corresponding adjustments according to their adaptability, with clear directivity. Youmei Wang, Haijie Wang, Dan Wang and others believe that ChatGPT plays multiple roles in educational digitization, including teaching assistants and personalized butlers [8]. Yet this may lead to students overly relying on ChatGPT and neglecting their active learning and thinking, even engaging in some inappropriate behaviors such as plagiarism and cheating. At present,

some universities have made regulations on this, such as the University of Cambridge and the University of Oxford, they prohibit students from using ChatGPT to complete assignments and do not allow it to be used as their own original work. The Hong Kong Polytechnic University has made explicit regulations on this matter, pointing out five guidelines to be noted when using GenAI. GenAI, as a language tool, cannot replace students in creative work [9]. Although ChatGPT has developed rapidly, the accuracy of the data still needs to be improved. Most college students are only in initial contact with it, and their maturity and effectiveness in using it also need to be verified.

2.3. Ethical Issues

ChatGPT has provided great convenience for higher education in areas such as information collection, literature review and data analysis. Yet there are also many hidden moral issues inevitably.

In addition, ChatGPT contains a large amount of student data, the security and privacy of the data must be guaranteed to prevent data leakage or misuse. Luo thinks that ChatGPT is essentially a tool used by capitalists to achieve capital growth, it may seem like it can indeed serve education on the surface, but education is one of the objects of profit, ultimately leading to the transformation of "life people" into "data people" [10]. In addition, there are also some fairness issues, such as family background, equipment conditions, etc. It is necessary to pay attention to these differences and ensure that all students can enjoy the educational advantages brought by ChatGPT fairly.

3. Educational Futures and New Possibilities

3.1. ChatGPT-Facilitated Education

The power of ChatGPT has opened up new opportunities in the field of education. It can provide students with a more personalized learning experience through intelligent Q&A, intelligent recommendations, and more. At the same time, ChatGPT can also help teachers provide teaching assistance, and improve teaching quality and efficiency. According to Yongxin Zhu and Fan Yang, ChatGPT offers five potential avenues for educational innovation, including reducing teacher workload and acting as a tool for teaching assistants: responding to professional academic inquiries and accelerating scientific and research advancements. It might be possible to create a self-learning platform that offers customized private instruction. It is possible to save costs on human resources, simulate interactive learning scenarios, and restructure the educational system to concentrate on future learning centers [11]. Meanwhile, the use of ChatGPT in the field of education has also led to the transformation and modernization of education. Deyu Tao believes that the emergence of artificial intelligence will not replace the work of teachers but will improve the efficiency of teaching [12]. Some teachers can use ChatGPT to integrate the teaching methods of famous teachers, optimize their teaching methods, fill the gaps in their teaching methods, and form their own unique teaching methods.

3.2. Tailored Learning Suggestions for Diverse Majors

The future development prospects of ChatGPT are promising, not limited to advancing professional training. ChatGPT can provide tailored learning suggestions, answers, questions, and other services based on the characteristics and learning needs of students in different majors. Regarding the field of medical education, Xiaobin Wang, Guan Wu, Qingqing Lin, and Huji Xu believe that ChatGPT can help teachers overcome time and location limitations, allowing students to respond and question their different learning needs, and solve their medical problems from multiple dimensions [13]. For example, for a disease, ChatGPT can provide answers on etiology, pathology, clinical presentation, treatment principles, and prognosis to help students understand it in a concise and practical way [12]. In addition to the field of medical education, ChatGPT also plays a catalytic role in the field of legal education. Heng Deng and Cong Chen stated that traditional legal education will not be marginally harmed by ChatGPT's current progress. In order to enhance the overall quality of students' learning, it will inspire educators to learn how to apply the features of earlier technologies, develop creative legal courses, and regularly update their pedagogical approaches [14].

Overall, ChatGPT has enormous potential in the field of education, and its impact on education is also revolutionary. Traditional education systems should keep up with the times, constantly innovate, and cultivate more talents.

4. Suggestions for Educational Practitioners

ChatGPT can enhance the understanding of professional knowledge and terminology in the field of higher education. Though different disciplines have different specific concepts and theories, ChatGPT analysis is also helpful in gaining a deeper understanding in order to provide more accurate and targeted assistance to students and teachers. It can help integrate real-time updated higher education resources, such as the latest research results, academic journal articles, educational policies, etc., in order to provide users with the latest information and insights. Additionally, ChatGPT can develop customized features for higher education. For example, providing academic writing guidance, research method support, course assistance, etc. These features can help students better complete assignments, understand course content, and enhance academic abilities. Strengthen personalized support for students and teachers, such as providing customized advice and assistance based on the user's subject area, learning goals, and personal preferences. Moreover, ChatGPT can also integrate social functions. For instance, a communication platform between students and teachers can also be used to create virtual classrooms or discussion groups to promote knowledge sharing, collaborative learning, and academic discussions among students.

These suggestions can make ChatGPT more effectively integrated into higher education resources, providing more comprehensive, personalized, and targeted support for students and teachers.

5. Conclusion

This research examines the utilization of ChatGPT within the educational sector, conducting an in-depth analysis of how it can effectively boost learning efficiency in higher education settings. With the rapid advancement of artificial intelligence technology, ChatGPT emerges as a revolutionary tool, presenting both fresh opportunities and challenges in the realm of education. Through an extensive review of relevant literature, several key findings were identified: Firstly, integrating ChatGPT into the educational landscape is poised to transform teaching methodologies, shifting from traditional lecture-based approaches to more interactive, question-driven learning models. This shift aims to cater more effectively to the diverse learning preferences of students. Secondly, while ChatGPT holds the potential to enhance study efficiency, it also raises concerns about possible negative behaviors, such as dependency and academic dishonesty among learners. This underscores the need for establishing clear guidelines and ethical standards. Thirdly, the application of ChatGPT in educational contexts brings to the forefront ethical considerations, particularly in terms of data security and the safeguarding of personal privacy.

The importance of this study is underscored by its contributions towards offering practical insights and theoretical foundations for the integration of ChatGPT into higher educational resources, aiming to elevate learning outcomes. Looking ahead, the broader adoption of ChatGPT is expected to drive educational advancement, providing students with highly personalized learning experiences and supporting various academic disciplines. Nonetheless, the ethical dilemmas associated with ChatGPT's educational use, including the protection of student rights and data privacy, must be carefully addressed. Hence, this paper advocates for enhanced regulatory measures and oversight concerning the educational application of ChatGPT, to ensure its beneficial use and to stimulate continuous innovation and progress in the field of education.

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