Prospects and Ethical Considerations of Generative Artificial Intelligence in Higher Education

Liji Ma¹, Die Zhao²*

¹Department of Foreign Language Studies, West Yunnan University, 677000 Lincang Yunnan, China
²Department of Teacher Education, West Yunnan University, 677000 Lincang Yunnan, China

Abstract. The rapid development of Generative Artificial Intelligence (GAI) in higher education presents abundant opportunities for its high-quality development, but also introduces ethical concerns. This paper analyses the benefits of GAI in higher education in terms of teaching, learning, and evaluation. Additionally, it explores the ethical risks and reasons associated with GAI in higher education covering aspects such as data, algorithms, academia, and teacher-student relationships. The paper concludes by proposing methods and strategies to mitigate these ethical risks.

1. Introduction

Artificial Intelligence is instigating a transformative wave in education worldwide, prompting countries to adopt strategic plans for its integration into educational frameworks. In 2016, the United States released reports like "Preparing for the Future of Artificial Intelligence" and "The National Artificial Intelligence and Development Strategic Plan." The United Kingdom initiated the AI fellowship program in 2017 with the release of "Growing the Artificial Intelligence Industry in the UK." Singapore, in 2018, launched the AI Singapore program, focusing on creating a Community of Doers and Thinkers in AI. China, through its "Development Plan of New Generation Artificial Intelligence" and "Action Plan Education Informatization 2.0," has been actively promoting the integration of AI and education.

The future of higher education is intrinsically linked with the development on new technologies and computing capacities of the new intelligent machines. With its rapid development, AI offers significant potential for education, higher education, and learning AI has the capacity to mimic human-like responses, such as reasoning, exercising judgement, and exhibiting intentionality. The application of artificial intelligence in higher education has empowered teaching through reducing the redundant works, personalized learning and teaching reflections based on data provided by artificial intelligence, enabling them to focus on innovative and enlightening teaching activities. Additionally, AI fosters student motivation through technologies like audio recognition and natural language processing and personalized teaching with a teacherbot, or 'cloud-lecturer', can be adopted for the blended delivery courses or fully online courses.

The emergence of ChatGPT-3.5 on Nov. 30th, 2022, marked a global milestone, ushering in a new era of Generative Artificial Intelligence (GAI). The rapid development of GAI, exemplified by ChatGPT, introduces synthetic artifacts by analyzing training examples, learning patterns, and creating realistic facsimiles. GAI products, leveraging Large Language Models, excel in natural language processing, multi-model information processing, learning, adapting, and logical reasoning. The potential impact of GAI on teaching concepts, content, and the teaching-learning relationship is profound, encompassing diverse outputs from texts to images.

Despite the promise of deeper integration between GAI and education, ethical concerns loom large. A Forbes report in 2023 reveals a surge in students using ChatGPT for assignments, raising issues of plagiarism, cheating, and ethical learning challenges. Notably, leading institutions like Imperial College London and the University of Cambridge are responding by either banning or condemning GAI use in homework as plagiarism.

Previous research in AI and education has addressed fairness, the potential replacement of human teachers, data ethics, and algorithmic ethics. However, scant attention has been given to an integrated analysis of ethical issues of GAI in higher education. This research aims to deepen the understanding of ethical risks of GAI in higher education and propose effective strategies to promote its healthy integration. In higher education settings, the features of GAI in deep learning and advanced learning levels can be further explored. Therefore, increased attention to the application of GAI in higher education is important for a comprehensive understanding of its ethical implications.

* Corresponding author: judycho_945@naver.com

© The Authors, published by EDP Sciences. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).
2. Prospects of GAI in Higher Education

GAI has been defined as one of the most disruptive technologies in higher education. The 2023 EDUCAUSE Horizon Report: Teaching and Learning Edition advocates the concept of “shared humanity” to build a more humane teaching environment in higher education, achieved through the integration of AI and human empathy. GAI exhibits capabilities such as generating human-like texts and images, responding to inquiries, engaging in creative writing, managing multi-turn conversations, and aiding in coding and programming tasks. Faculty members in higher education can leverage GAI tools to compose proposals, reports, generate teaching materials and provide other assistive support. With the potential to inspire teaching and resolve difficulties in teaching methodology optimization, GAI can benefit higher education from aspects of empowered teaching, learning facilitation, and optimized evaluation.

2.1. Empower Teaching by Improving Efficiency

GAI empowers the teaching of faculty members with its strong interactive abilities and knowledge base. In a ChatGPT environment, teachers can use ChatGPT to create interactive and engaging learning materials and make the presentation content more dynamic with its multi-modal processing ability, provide efficient feedback on academic papers, and assist in refining teaching plans. This optimization of teaching structure reduces redundant tasks, allowing educators to prioritize individual student engagement. By analyzing previous teaching data and teaching materials, GAI can produce targeted teaching courses and materials to meet specific requirements of educators. Moreover, GAI exhibits the potential to translate the teaching content in the classroom into various forms of texts, images, and videos, which can then be shown simultaneously on students’ electronic devices to foster a more immersive teaching environment.

2.2. Fostering Student-Centered Learning Environment

Unlike tertiary and secondary education, in higher education, most universities do not restrict the access to internet or the use of electric devices, granting students education, most universities do not restrict the access to electronic devices to foster a more immersive teaching environment.

2.3. Optimize Evaluation through Advanced Technology

Curriculum experts advocate a shift in higher education evaluation, moving from assessing memorization to evaluating students’ capabilities in sophisticated reasoning and logic. GAI plays a pivotal role in this transformation by supporting technological advancements. For example, chatbot, a GAI variation, simulate patient dialogues for medical students, requiring the application of learned knowledge to real medical scenarios. Moreover, GAI, with natural language processing and logical reasoning, helps teachers optimize teaching method by providing analysis reports on student performance. Visualized reports, produced after detailed analysis of student daily activities, enable teachers to optimize their teaching strategies. What’s more, by analyzing assignments, reports, online discussions, and other forms of students’ performance, GAI will understand students’ thinking patterns and offering tailored advice to enhance their reasoning abilities.

3. Ethical Considerations of GAI in Higher Education

In intelligent education, fostering a people-centered approach with technology as an empowering tool is advocated. Despite rapid advancements in AI, the idea that we can solely rely on technology is a dangerous path. Numerous ethical concerns, present or impending, have adversely affected or will impact Generative GAI in higher education, posing threats to student development, human-teacher relationships, and the academic environment. This paper categorizes these ethical issues into four aspects: data ethics, algorithmic ethics, academic ethics, and teacher-student relationship ethics.

3.1. Data Ethics

Data intelligence is foundational to intelligent educational system. Data security is an issue of great importance to the education. The entire data cycle, encompassing generation, storage, usage, and disposal, must be integrated seamlessly for GAI use. Lack of procedures or inappropriate data use poses serious ethical issues. In the data generation process, Attention is required in obtaining data acquisition consent, as this
informed process is often omitted, leading to potential theft of sensitive data. GAI's data collection from diverse sources may generate misleading content, impacting individual student development and the overall educational ecosystem. Storage considerations include format, length, and administration, with third-party plugins introducing additional risks. Utilizing data covers even more aspects, such as authorization, biased student evaluations and the timely disposal of user-input data, stressing the urgency of protecting data privacy for the healthy development of GAI in higher education.

3.2. Algorithmic Ethics

Higher transparency is a common refrain when discussing ethics of algorithms in relation to dimensions such as how an algorithmic decision is arrived at, based on what assumptions, and how this could be corrected to incorporate feedback from the involved parties [21]. On the one hand, algorithmic bias may arise during model training involving human feedback and multilingual training data, potentially introducing unknown biases. On the other hand, GAI’s use of complex deep learning algorithms may produce seemingly logical answers without revealing the reasoning or decision-making process, leading to students accepting incorrect answers. Persistent GAI use may create information cocoons, exacerbating educational disparities and threatening fairness.

3.3. Academic Ethics

The academic spirit is the scholarly character and academic manner demonstrated by academic researchers in their scholarly pursuits [22]. Academic integrity is a backbone of the university’s spirit. Theoretically, academic integrity is a form of processional ethics, while in practice, it becomes much fragile in the face of alluring of interests. For example, a study conducted by International Center for Academic Integrity shows that more than 60% of college students admitting to cheating in some form. Academic ethics fall into the category of the ownership of intellectual property rights and fairness in academic evaluation. GAI’s ability to reconstruct data as coherent answers raises concerns about the ownership of intellectual property rights. As to the fairness in academic evaluation, GAI’s use in academic environments may compromise fairness in academic evaluation, as distinguishing AI-generated content from human-created work remains challenging. According to Insider, a religious studies and philosophy professor at Northern Michigan University found that essays submitted by two students were written by ChatGPT, a GAI platform. The structure was too sound and the idea too advanced that he rose a red flag to the assignment. Whether the assignment and essays produced by GAI should be seen as a form of plagiarism remains as a question to us. Although various forms of AI detection tools have been released, for example, OpenAI’s AI Text Classifier, it is still imperative to address potential plagiarism concerns in academic evaluation.

3.4. Teacher-Student Relationship Ethics

Teacher-student relationship is one that is formed as both sides recognize their roles in education [23]. As a form of social relationship, it evolves with social and technological development. Using GAI for educational purposes or as a pedagogical tool has improved effectiveness, efficiency, and quality of the work. However, overreliance on it by teachers may diminish their identity, impacting the nurturing purpose of education. Students relying heavily on GAI may experience reduced reasoning abilities and hindered knowledge exploration. GAI’s customized learning models may create information cocoons, limiting comprehensive knowledge acquisition. Regarding teacher-student interactions, immediate feedback from GAI may challenge the authority of teachers, potentially undermining the traditional teacher-student relationship as students acquire more customized and verified knowledge from it.

4. The Practical Implementation GAI in Higher Education

The integration of GAI in higher education presents both opportunities and challenges, necessitating a resolution of ethical concerns. The relationship between higher education and GAI is not a zero-sum game; instead, their synergy should be fostered for sustainable development in higher education.

4.1. Promoting a People-Centric Philosophy in Higher Education

Higher education, fundamentally centered around individuals, aims to cultivate high-quality and innovative intellectuals for economic and social development. GAI, as an important assistant to cultivate professional intellectuals and academic teaching staff, can bolster the development of higher education. Teachers should acknowledge the increasing role of GAI in generating teaching content and analyzing data. However, caution is advised against making GAI the dominant force, displacing human teachers. GAI, as a higher form of AI, should adhere to the principle of serving higher education. For students, GAI can evaluate their understanding levels, devise learning plans, provide customized learning materials and deliver immediate feedback for them. While reliance on GAI should be balanced to avoid hindering comprehensive student development, its role is to empower higher education through supportive assistance, aligning with the people-centric philosophy.

4.2. Establishing Laws and Regulations on GAI Ethics

While GAI introduces opportunities, it also brings challenges like information cocoons, academic plagiarism, and algorithmic bias to higher education. Governments, following the European Union's lead in
the EU AI Act, should formulate comprehensive regulation standards and systems for GAI. In addition, governments should monitor and review the design of algorithm to ensure the algorithm remains unbiased. Meanwhile, governments should establish an accountability system on GAI ethics to ethical issues promptly.

4.3. Enhancing Ethical and Intelligent Awareness for Teachers and Students

The digitalization of higher education demands increased intelligent and ethical awareness among teachers and students. Intelligent awareness involves understanding GAI's operational logic, crucial for intelligent teaching. Ethical awareness encompasses considerations such as privacy issues, algorithmic bias, and moral responsibilities related to GAI. Professional development for teachers and curriculum integration for students should include intelligent operation and ethical training. Providing successful GAI implementation cases will enhance understanding and promote ethical and intelligent use of GAI in higher education. These can help improve teachers’ and students’ ethical and intelligent use of GAI.

4.4. Establishing A Mechanism for Protecting Students’ Privacy

College students have more autonomy and are more responsible for managing the learning than those in primary and tertiary levels. They need to adapt to a more diverse and complex academic environment. Given college students' autonomy and responsibility, regulations safeguarding privacy rights in GAI interactions are essential. To better regulate GAI’s behaviors, Governments should release privacy protection rules, oversee GAI activities, define rights and responsibilities, and impose penalties for privacy violations. Universities should establish rules governing the use of students' data, coupled with ethical training for management staff to ensure compliance with ethical standards. Collaborative efforts between governments and universities are crucial for effective privacy protection in GAI applications in higher education.

4.5. Optimizing Methods on Evaluation

The rapid development of GAI necessitates a reevaluation of teaching evaluation methods in higher education. In an era of GAI, teachers need to focus more on critical thinking, like analysis, synthesis, evaluation, and creativity, than on traditional method of memorization of facts. Educators should design challenging tasks to foster independent thinking and incorporate diverse evaluation methods, including written examinations, peer reviews, and self-assessments. Meanwhile, in the previous outcome-driven education, both teachers and students pay more attention to the result of the teaching and study; in the context of GAI in higher education, shifting the focus from outcome-driven education to include student participation and reflection in the learning process will adapt higher education to the GAI era.

5. Conclusion

High education is not immune to technological advancement, and the development of GAI technology provides substantial benefits to higher education, potentially revolutionizing human-machine interactions. To harness these benefits while addressing ethical concerns like data leaks and algorithmic bias, it is imperative to improve the legal and regulatory framework for GAI, update educational concepts, and enhance education and awareness regarding ethical rules and standards. This approach is essential for promoting the holistic development of GAI in higher education.

References

3. Yu, W., Qiong, W., D. Edu. CHN. 1, 12-19 (2022)
8. Yong, G., Ling, Q., IM. S. SCI. 4, 34-42 (2023)
16. Linqi, G. J. TJ. Norm. Univ. 24, 36-40 (2023)
20. Xiaomin, W., Chaojuan, L., JS. SCI. 2, 68-77 (2023)
22. Zeping, P. Nanfang, Z., Mod. Edu. Mgt. 4, 54-65 (2023)