

Research on the Application of AIGC in Higher Education Teaching in the Era of Artificial Intelligence

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Abstract: With the rapid development of artificial intelligence technology, AI-Generated Content (AIGC) has gradually become a hotspot in the field of education. AIGC not only provides new tools and methods for higher education teaching but also demonstrates enormous potential in curriculum design, teaching evaluation, and personalized learning. However, the application of AIGC in higher education faces numerous challenges, including the reliability of technology, ethical issues, and the transformation of the teacher's role. Effectively integrating AIGC into the teaching process to enhance educational quality is a topic that requires in-depth research by educators.

Keywords: Artificial Intelligence; AI-Generated Content; Higher education teaching

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In an era of rapid digital development, a new technological revolution led by next-generation information technologies such as big data, cloud computing, and generative artificial intelligence is driving the digital transformation and technological change in education. As an emerging technology, AIGC is gradually being integrated into various fields, especially in the teaching and management of higher education. AIGC technology can learn from and understand vast amounts of data to generate high-quality content, including text, images, audio, and video. The emergence of this technology has significantly changed traditional teaching models, bringing new opportunities and challenges to higher education.

1. Overview of AIGC

AIGC refers to the technology that uses artificial intelligence to generate multimedia content such as text, images, audio, and video. The key to this technology lies in breakthroughs in machine learning models, particularly in natural language processing (NLP) and deep learning, which enable computers to understand, generate, and improve human language, thereby creating high-quality teaching content.

Common AIGC tools include OpenAI's GPT series, Google's BERT, and various other AI-based content generation platforms. These tools can quickly generate logical and creative text based on user-inputted topics, styles, and requirements, significantly improving the efficiency of teaching content production.

2. Advantages of AIGC

(1) Efficiency

AIGC can rapidly generate large volumes of content, saving time and labor costs, making it particularly suitable

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for scenarios requiring extensive text, images, or audio.

(2) Personalization

By analyzing user data, AIGC can produce personalized content to meet the diverse needs and preferences of different users, enhancing user experience.

(3) Creative support

AIGC can provide inspiration and suggestions to creators, helping them overcome creative bottlenecks and stimulate new ideas.

(4) Diversity and flexibility

AIGC can generate various styles and types of content, including text, images, videos, and music, adapting to different application scenarios and needs across various fields and industries such as advertising, education, and entertainment.

(5) Lowering the bar for creation

AIGC enables non-professionals to create high-quality content, lowering the barriers to creation and promoting widespread participation in content creation.

(6) Language processing capability

Advanced generative AI can understand and generate content in multiple languages, facilitating cross-cultural communication and global collaboration, helping businesses and individuals improve international communication.

(7) Data analysis capability

Generative AI can process large amounts of data, extracting insights and generating relevant content, applicable in market analysis, report writing, and other scenarios.

(8) Continuous learning and improvement

Through ongoing training and updates, generative AI can continually enhance the quality and relevance of generated content, adapting to changing user needs.

(9) Enhanced interactivity

In applications such as chatbots and virtual assistants, AIGC can provide a more natural and human-like interactive experience, improving user satisfaction.

(10) Decision support

AIGC can generate analytical reports and predictive models, providing data-driven decision support for businesses and individuals, facilitating more informed choices.

These advantages have led to the widespread application of generative artificial intelligence across various fields, including education, entertainment, marketing, journalism, and game development, driving innovation and development in multiple industries.

3. Application of AIGC in Higher Education Teaching

(1) Generation of teaching content

In traditional higher education, creating course content often requires significant time and effort. Educators

can leverage AIGC technology, utilizing natural language processing (NLP) and machine learning algorithms to analyze knowledge graphs related to the course, quickly generating rich course content that meets curriculum requirements. This is particularly important in rapidly changing disciplines and fields, ensuring that teaching content remains cutting-edge and timely.

(2) Innovative teaching methods

The application of AIGC makes teaching methods in higher education more diverse and innovative. For instance, educators can use AIGC to generate interactive teaching scenarios and case studies, enhancing student engagement and practical skills. Additionally, AIGC can support new teaching models such as virtual laboratories and simulation training, providing students with richer learning experiences.

(3) Personalized learning

Every student's learning needs and pace are different, and AIGC technology can provide personalized learning experiences based on students' learning data and habits. For example, AIGC can analyze students' assignments and exam results to identify their weaknesses and generate targeted learning materials and exercises accordingly. This personalized approach not only improves students' learning efficiency but also enhances their interest in learning. AIGC can also generate resources suitable for different learning levels in real-time, allowing each student to progress based on their foundation. This tailored instruction greatly satisfies the individualized needs of different students.

(4) Teaching assistance and Q&A

In modern teaching, educators often face numerous student inquiries. AIGC technology can serve as an intelligent teaching assistant, helping to address common questions. Through chatbots and similar forms, AIGC can provide real-time answers to students' questions, offer supplementary materials, and even conduct simulated exams and practice. This intelligent assistance significantly reduces the burden on educators.

4. Challenges of AIGC in Higher Education Teaching

(1) Ethical and legal issues

The application of AIGC involves ethical and legal issues related to intellectual property and data privacy. For instance, does the content generated by AIGC infringe on others' intellectual property? When students use AIGC-generated learning materials, could this lead to plagiarism? These issues necessitate the formulation of corresponding policies and regulations by higher education institutions to ensure the legality and ethics of teaching.

(2) Assurance of educational quality

Although AIGC technology can generate a vast amount of teaching content, the quality and accuracy of this content still require strict oversight. If educators fail to effectively review the generated content, it may lead to the dissemination of incorrect information. In certain fields, such as medicine and engineering, the accuracy and timeliness of knowledge are critically important, making quality assurance a significant challenge. Therefore, higher education educators must remain vigilant when using AIGC technology to ensure the authenticity and reliability of the content used.

(3) Transformation of the teacher's role

The application of AIGC technology will lead to a transformation in the role of educators. In traditional teaching models, educators are knowledge transmitters, while in the AIGC era, their role resembles that of

guides and coordinators. Educators will need to spend more time on personalized guidance and in-depth academic exploration rather than merely transmitting information. This shift in role requires educators to continuously enhance their skills and competencies to adapt to the new teaching environment.

(4) Over-reliance on technology

With the development of artificial intelligence and the popularization of AIGC technology, both educators and students may become overly reliant on technology to complete teaching and learning tasks, thereby diminishing their ability to think independently and creatively. This dependency may hinder the development of students' critical thinking and innovation skills, necessitating reasonable guidance in teaching to maintain a balance between technology and human intelligence.

5. Strategies for Addressing AIGC in Higher Education

(1) Establishing ethical standards and review mechanisms

To address ethical issues, higher education institutions should actively formulate ethical standards for the application of AIGC, including content generation standards and originality review mechanisms. Institutions can also establish expert groups to regularly review generated content to ensure its academic quality and usability.

(2) Strengthening teacher training and professional development

Higher education institutions should provide more training and professional development opportunities related to AIGC technology for educators. By regularly organizing lectures, workshops, and online courses, educators can update their knowledge and skills and master effective methods for using AIGC technology.

(3) Establishing a diverse feedback system

Higher education institutions can leverage AIGC technology to establish a diverse feedback system. By collecting and analyzing student feedback, institutions can continuously adjust and improve teaching content and methods. Additionally, educators should encourage students to share their opinions on AIGC-generated content to promote interaction and discussion between teachers and students.

(4) Encouraging innovation and research

Higher education institutions should encourage educators and students to innovate and conduct research in the application of AIGC, exploring new teaching methods and models. Through practice and research, they can accumulate experience in the application of AIGC in teaching, providing references for other institutions.

(5) Guiding students in the responsible use of AIGC

Educators should guide students in the responsible use of AIGC-generated learning resources, fostering their autonomous learning abilities and critical thinking. By conducting related courses and activities, educators can help students recognize the advantages and limitations of AIGC, enhancing their learning capabilities.

6. Conclusion

Although the application of AIGC in higher education teaching faces numerous challenges, its potential should not be underestimated. By effectively utilizing this technology, higher education institutions can enhance teaching efficiency, enrich teaching content, and promote personalized learning. At the same time, in the face of challenges such as ethical issues, educational quality assurance, and the transformation of the

teacher's role, the education sector should actively explore strategies to ensure the healthy development of AIGC technology. In future developments, the integration of AIGC with higher education will bring new momentum to educational reform and contribute to cultivating talents with greater innovative capabilities.

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