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Challenges and Opportunities of Generative Artificial Intelligence in Higher Education Student Educational Management

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Abstract: Generative Artificial Intelligence (AI), as an emerging technology, is rapidly gaining popularity and widespread application across various domains, sparking extensive discussions and exploration on a global scale. With the integration of generative AI into higher education ecosystems, a new era of transformation awaits in the realm of higher education student educational management. While enjoying the technological dividends of generative AI, its inherent risks must also be duly recognized. This paper focuses on the implementation of generative AI technology in the domain of higher education student educational management, exploring the challenges and opportunities it presents, and proposing reference pathways to address them.

Currently, generative artificial intelligence products, exemplified by ChatGPT[1], have garnered widespread attention and sparked intense discussions both domestically and internationally. Particularly in the domain of higher education student educational management, these AI advancements have triggered vigorous explorations. Compared to conventional internet technologies, generative artificial intelligence distinguishes itself by not only possessing search capabilities but also enabling secondary processing and creative generation of retrieved materials. Leveraging its powerful learning ability, flexible expression capacity, and cross-disciplinary application potential, generative AI significantly enhances learning and work efficiency, while posing considerable challenges to student educational management.

Although generative AI lacks human emotions, intuitions, and life experiences, and remains constrained by pre-set rules and algorithms, it can break free from human limitations in information acquisition, knowledge retention, and cognitive biases through extensive data analysis and pattern extraction[2]. This breakthrough contributes to a plethora of possibilities and opportunities in human production, daily life, and scientific research. Focusing on the context of higher education student educational management, this paper delves into the challenges and opportunities presented by generative artificial intelligence products and endeavors to provide suggested strategies for addressing them.

1. Challenges of Generative Artificial Intelligence in Student Educational Management

1.1 Creativity Facing Trust Crisis

The algorithms of generative artificial intelligence enable the automatic generation of complex articles, papers, and essays, allowing students to effortlessly access a vast array of content and ideas. This convenience may tempt some students to misuse generative AI as a substitute for original thinking and research, leading to a decline in academic integrity[3]. There is a risk of simply copying and pasting the generated content, further compromising the academic honesty of students. Moreover, the ability of generative AI to produce high-quality works might entice students to rely on such content instead of engaging in in-depth thinking and research[4]. Additionally, the emergence of generative AI poses challenges in detecting and addressing academic misconduct. As generated works often lack comparability with existing databases and literature, detecting plagiarism and fraudulent practices becomes increasingly challenging.

1.2 Subversion of Certain Teaching Scenarios

Generative artificial intelligence is challenging the traditional knowledge-centric approach to teaching. Firstly, in personalized education, traditional personalized teaching often relies on teachers' experiences and judgment, resulting in limited efficiency. However, generative AI can analyze students' learning data to recommend the most suitable learning resources and teaching methods for each individual. Secondly, in intelligent tutoring, conventional methods often require students to consult teachers for assistance, which can be time-consuming and inefficient. Generative AI, on the other hand, can analyze students' learning data to provide real-time learning advice and feedback. Thirdly, in the domain of learning outcome assessment, traditional online evaluations often demand significant time from teachers to organize students' exam papers and assignments, leading to reduced efficiency. However, generative AI can analyze students' learning data to offer teachers real-time student evaluation results and feedback.

1.3 Data Security and Ethical Concerns

The involvement of extensive data in generative artificial intelligence may pose risks of information leakage[5] and potential biases in value systems[6]. Firstly, teachers and students using ChatGPT may generate significant information, which could be used for model feedback and improvement, potentially leading to risks of information leakage between teachers and students. Secondly, as ChatGPT is developed by a U.S.-based company and mainly references foreign data, it may contain biases and value system deviations due to differences in nationality, lifestyles, and other factors across different countries and regions. If not appropriately constrained in its usage, this could impact the formation of students' emotions and value systems. Therefore, to ensure data security and ethical standards, the application of ChatGPT must earnestly address these concerns.

2. Opportunities of Generative Artificial Intelligence in Student Educational Management

2.1 As a Universal Teaching Resource

In traditional education, subject knowledge is often compartmentalized into independent disciplinary domains, limiting students' exposure to diverse knowledge. However, generative artificial intelligence possesses cross-disciplinary creative abilities, enabling the generation of educational content that covers multiple subject areas, such as interdisciplinary knowledge, practical

skills, and comprehensive problem-solving methods. Generative AI can also customize teaching content based on students' learning characteristics and interests, providing personalized learning materials. This fosters students' initiative and enthusiasm for engaging in cross-disciplinary learning and exploration. Moreover, personalized learning resources help students better comprehend and internalize the content they are studying, ultimately enhancing learning efficiency and quality.

2.2 As a Tool for Comprehensive Student Assessment and Prediction

Traditional student assessment often relies on exam grades and subjective performance evaluations, which may not fully capture students' comprehensive abilities and potential. Through data analysis by generative artificial intelligence, a more comprehensive assessment of students' performance in learning, practice, communication, and innovation can be achieved. Additionally, generative AI can leverage big data analysis and machine learning techniques to predict students' future learning trajectories. By analyzing students' historical data and learning patterns, generative AI can provide educators and schools with forecasts of students' future academic achievements and subject interests, helping them formulate personalized learning plans and development strategies.

2.3 As a Tool for Generating and Optimizing Educational Content

Teachers often dedicate considerable time and effort to prepare course materials, design instructional activities, and evaluate students' learning outcomes. By leveraging generative artificial intelligence technology, teachers can automate these laborious tasks, allowing them to focus more on improving teaching quality and refining instructional methods. Furthermore, generative AI can analyze students' feedback and learning data, assisting teachers in identifying areas of improvement and timely adjustments in their teaching practices. The integration of generative artificial intelligence into student educational management presents promising opportunities, empowering educators with personalized and data-driven approaches to enhance teaching effectiveness, student learning experiences, and overall educational outcomes. However, it also demands careful consideration of ethical and security issues to ensure responsible and beneficial implementation.

3. Coping Strategies for Generative Artificial Intelligence in Student Educational Management

3.1 Prioritize Education over Utility

While artificial intelligence offers undeniable benefits in facilitating knowledge acquisition and learning convenience, it lacks human-like emotions and moral judgments. Human-AI interactions can provide knowledge, but they cannot replace the essence of emotional and empathetic communication. Emphasizing the importance of education and nurturing individuals with well-rounded qualities becomes crucial when employing AI for knowledge dissemination. Efforts should be directed towards enhancing students' character, intellect, physical fitness, aesthetics, and practical abilities to create holistic and well-rounded individuals.

3.2 Strengthen Theoretical Guidance

From the perspective of values and ethics, students need guidance on how to use generative artificial intelligence effectively, responsibly, and efficiently for their own learning. Classroom discussions, workshops, or seminars can be organized to explore high-quality utilization of AI tools, such as identifying functionalities that enhance learning, effective questioning to optimize AI responses, adopting critical thinking when accepting generated content, exploring complementary

tool combinations, and promoting encouraged or discouraged behaviors while utilizing AI for learning.

3.3 Foster Comprehensive Information Literacy

Fostering a comprehensive level of information literacy among students continues to be of paramount importance in academia. Empowering students with the necessary skills to navigate intricate challenges and access reliable academic information is crucial. As the integration of generative AI tools for educational support becomes more prevalent, it becomes imperative for students to cultivate a profound level of information literacy. This proficiency will enable them to critically assess and effectively apply the retrieved information to tackle pertinent issues and academic problems with precision and discernment.

3.4 Cultivate Cognitive Process Skills

Promoting the cultivation of cognitive process skills is a vital aspect of effective teaching and learning. Teachers can actively encourage students to partake in reflective practices and demonstrate their writing processes through various mediums such as written reports, oral presentations, concept maps, videos, and animations when submitting their articles. In doing so, students are provided with a platform to articulate their thought processes, outline adjustments made to the logical structure and ideas, elucidate the retrieval tools and methodologies utilized, highlight influential literature that informed their work, elucidate challenges encountered during the writing process, and conduct an in-depth evaluation of the strengths and weaknesses of the final draft.

Engaging in these reflective practices empowers students to embark on a journey of self-discovery and introspection, enabling them to gain a profound understanding of their learning experiences and accomplishments. By actively analyzing their writing processes and critically evaluating their work, students can foster a heightened sense of self-awareness and an appreciation for the complexities of academic inquiry. This process of self-reflection not only enhances their cognitive process skills but also reinforces metacognitive abilities, equipping them with the tools to become more effective and self-directed learners. Moreover, as students share their insights and experiences with their peers and instructors, a collaborative learning environment is nurtured, facilitating knowledge exchange and constructive feedback that further enhances their cognitive growth and academic development.

3.5 Promote Academic Integrity and Technology Ethics Education

Academic integrity education should be an integral part of students' learning journey. Educators should emphasize the importance of academic honesty, emphasizing the value of originality and adherence to academic norms. Students must recognize that although generative artificial intelligence offers convenient and efficient learning tools, creative thinking and independent academic exploration remain central to academic growth and personal development. Furthermore, as generative AI involves the collection and processing of personal data, as well as the dissemination and use of private information, students must be educated on how their data is utilized in generative AI systems and how to safeguard their privacy and data security. Educating students on the working principles and mechanisms of artificial intelligence will help them understand the limitations and potential risks of generative AI applications. By implementing these strategies, educational institutions can harness the potential of generative artificial intelligence while ensuring responsible and ethical use, ultimately empowering students with a well-rounded education and preparing them for the challenges and opportunities of the AI-driven future.

In conclusion, generative AI products like ChatGPT have drawn widespread attention in higher

education student management. They offer great potential for enhancing learning efficiency, providing cross-disciplinary knowledge, and facilitating personalized learning experiences. However, challenges exist regarding academic integrity, traditional teaching methods, and ethical concerns. To address these challenges and maximize AI opportunities, educators must prioritize education over utility, foster comprehensive information literacy, and cultivate cognitive process skills through reflective practices. Integrating academic integrity and technology ethics education is essential to ensure responsible and ethical AI use. These strategies will prepare students for a future where AI plays a significant role in education and beyond.

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