The Influence of Generative Artificial Intelligence on High School Students' Academic Planning – ChatGPT

Jialu Guan[1,a], Jingying Zhang[2,b], and Xiule Zhang[3,c,*]

[1]*Department of Computing, School of English, Xi'an FanYi University, Yangzhou, 225261, China*
[2]*Shenghua Zizhu Academy, 155 Tanjiatang Road, Wujing Town, Shanghai, China*
[3]*Shanghai Baoshan World Foreign Language School, 29 Yunshang Road, Gucun Town, Shanghai, China*
a. 1326478766@qq.com, b. 3463000694@qq.com, c. skd990052@sdust.edu.cn
* corresponding author

Abstract: The advent of Generative Artificial Intelligence (AI) has ushered in a new era in education, profoundly reshaping the way high school students approach academic planning. The globe has been awed by the AI tool ChatGPT, a language model created by OpenAI, for doing incredibly difficult jobs. Since ChatGPT's outstanding ability to handle challenging tasks in the field of education appears to change present educational praxis, teachers and students have differing attitudes to this development in AI. Curriculum and content have been customized and adapted based on student needs using machine learning and adaptability, which has increased student uptake and retention. This has enhanced the learning experience for students as a whole. This comprehensive study investigates the multifaced impact of AI, particularly platforms like ChatGPT, on students' academic trajectories. This review article synthesizes extant literature to offer some potential benefits of ChatGPT in promoting learning and academic planning for high school students. By delving into its influence on course selection, learning methodologies, and academic objectives, this research sheds light on the transformative potential of AI in education and offers recommendations on how ChatGPT could be leveraged to the high school students' academic planning.

Keywords: artificial intelligence (AI), artificial intelligence in education (AIED), academic planning, high school students, ChatGPT

1.   Introduction

Since 2014, China has gradually implemented the revolution of College Entrance Examination (CEE). Based on the requirements of application of universities and their strengths, students in high school must select three studies from the following categories: politics, history, geography, physics, chemistry, and biology [1]. This option is complex, for there are about 20 combinations in total. What's more, due to the factors such as school teaching resources and teaching progress, it is difficult for students to change their original subject selection in the future. As a result, the high school students' academic planning proved to be of significance.

For a long time, AI has been used to change the way that education is delivered. The use of computers in various areas of the education sector, and more specifically, various departments in educational institutions, such as the development of computer aided instruction and learning (CAI/L)

in classroom interactions, was made possible thanks to advancements in AI like computers and related computing technologies that built on earlier research into programmed instructions from the mid-1900s [2]. A paradigm shift in learning dynamics and goals has been sparked by the emergence of Generative AI technologies, best shown by ChatGPT. This study explores the crucial role that developing tailored study programs for high school students plays in this dynamic educational environment, where AI is reshaping the educational experience. In this light, examining how AI affects academic planning becomes crucial to comprehending the modern learning process.

Despite the rapid advancements in AI, a comprehensive review of the impact of Generative AI on high school students' academic planning is notably absent in current literature. The evolving nature of AI and its integration into education warrants a comprehensive exploration, filling a gap in understanding the implications of AI for students' academic development. This study bridges this gap by offering insights in how AI is reshaping academic planning processes.

This research endeavors to unearth differences in education within the framework of AI-driven academic planning. As AI infiltrates classrooms, the potential for varying effects becomes a significant aspect of the evolving educational landscape. By analyzing these differences, the study contributes to a nuanced understanding of AI's impact on diverse student groups.

2. The Influence of Generative Artificial Intelligence on Students' Course Selection

2.1. Enhancing Convenience of Course Selection

Generative AI algorithms have ushered in a revolution in course selection by providing tailored recommendations that simplify the intricate decision-making process. With the ability to analyze vast amounts of data [3]. AI narrows down a plethora of course options a personalized set that matches a student's academic history, interests, and aspirations. This convenience not only alleviates the stress of choosing from a multitude of options, but also ensures that students embark on a focused academic journey that aligns with their individual strengths.

2.2. Enabling Personalized Course Selection

Customizing and personalizing curriculum and information in accordance with students' needs, abilities, and capabilities is an important way that Generative AI has been used to improve students' learning [4]. AI creates course recommendations that align with each student's intellectual preferences by mining data from a variety of sources, including academic achievement, extracurricular activities, and personal interests. These suggestions are intended to increase the value and effectiveness of learning through the use of various computing technologies, particularly those connected to machine learning [5], which are strongly related to statistical models and cognitive learning theory. This tailored approach transforms course selection into a personalized experience, enhancing student engagement and motivation. For instance, a student inclined towards visual learning might receive recommendations for courses rich in multimedia content, while a student with a penchant or problem-solving might be directed toward math and science courses.

2.3. Fostering Rational Course Selection

Generative AI extends beyond personalization to guide students in making informed course choices that align with their long-term academic goals. By analyzing historical data and trends, AI suggests courses that not only match a student's current preferences, but also contribute to a well-rounded and strategically planned academic trajectory. Peredo et al. analyze and highlight the applications of AI in education, noting that multi-agent systems (MAS), in particular, have a learner component, with the learner integrated as a social agent, and that the system focuses on understanding learner behavior

and adapting accordingly by generating content pertinent to the learners' needs [6]. For instance, if a student exhibits interest in computer science, AI may suggest related courses in engineering and mathematics to provide a well-rounded skill set. Students are given the tools to create an academic path that is both unique and well-founded in the future thanks to this logical approach to course selection.

3. The Influence of Generative Artificial Intelligence on Students' Learning Methodologies

3.1. Transition to Dual Curriculum Approach

Generative AI introduces a dual curriculum model, blending expert-led courses with generative learning methods. This integration capitalizes on the strengths of both traditional pedagogy and AI-driven innovation. While expert-led courses provide a strong foundational knowledge base, generative learning methods infuse creativity and adaptability into the learning experience. Generative AI would be integrated with existing educational curriculum materials, such as textbooks, lesson plans, and assessment tools. This would involve mapping the curriculum content to the underlying knowledge structure of Generative AI and ensuring alignment between the two. Besides this, Generative AI would be designed to facilitate collaborative learning by encouraging students to ask questions, engage in discussions, and seek clarification on topics related to the curriculum. It would provide explanations, examples, and further resources to help students understand the expert-led courses better. Moreover, Generative AI would be able to assess students' understanding and progress through quizzes, assignments, and interactive exercises. It would provide immediate feedback and suggestions for improvement, helping both experts and students identify areas where they need to focus and guiding them in their teaching and learning journey.This duality caters to diverse learning preferences, enabling students to engage with content in ways that resonate with them individually.

3.2. Embracing Problem-centric Pedagogy

Generative AI redefines pedagogy by empowering student-centered learning through problem-based teaching. Students are encouraged to actively engage with real-world situations by AI-generated scenarios and problem sets, which develops their ability to think critically and solve problems. For example, Generative AI can provide a supportive and non-judgmental environment for students to discuss their learning problems, dilemmas, and concerns. It can engage in empathetic conversations, offer encouragement, and provide suggestions for coping strategies. Also, Generative AI can engage students in reflective thinking to help them better understand their problems and possible solutions. It can ask thought-provoking questions, guide them through critical thinking exercises, and encourage them to consider different perspectives. This can enhance their problem-solving skills and promote personal growth. Moreover, Generative AI can facilitate collaborative problem-solving by encouraging students to work together and share their experiences. It can connect students facing similar problems, foster peer support networks, and facilitate group discussions where students can collectively brainstorm solutions to common challenges. AI transforms students into active learners who collaborate with AI to uncover innovative solutions. Furthermore, AI facilitates human-machine interactions that enhance comprehension of intricate concepts, promoting a dynamic exchange of knowledge.

3.3. Cultivating Interdisciplinary and Collaborative Learning

ChatGPT will facilitate the integration of cross-disciplines in the field of education; it can conduct accurate analysis of business; provide information technology support for the application of cross-

cutting fields such as agriculture, health care, and manufacturing; and cultivate interdisciplinary talents. AI-driven education champions interdisciplinary exploration, allowing students to uncover connections between seemingly disparate subjects. For instance, a science course might incorporate elements of art and design, demonstrating the interplay between scientific innovation and creative expression. This interdisciplinary approach enriches students' understanding of complex topics and prepares them for the multifaceted challenges of the modern world. Moreover, AI platforms facilitate project-oriented and group-based learning experiences that mirror real-world collaboration. By working collaboratively on projects that span various subjects, students learn to leverage their strengths and collaborate effectively, skills essential for success in contemporary workplaces.

4.   The Influence of Generative Artificial Intelligence on Students' Academic Goals

4.1.   Nurturing Diverse Thinking Approaches to Achieve Their Academic Goals

Generative AI stimulates a spectrum of cognitive approaches, encompassing creative, strategic, and multi-dimensional thinking. For instance, in problem-solving scenarios, AI might generate multiple potential solutions, encouraging students to explore various angles and options. This exposure to diverse thinking modes equips students with adaptable mental faculties essential for addressing multifaceted challenges, both in their academic journey and in their future careers. The large-scale application of ChatGPT will not change the core goal of education, which is to foster thinking and learning in students, because thinking is a mental activity that is unique to humans. Education and the development of thought must go hand in hand in order to support people's holistic development. However, ChatGPT does not have human autonomy, does not defend itself [7], and cannot make decisions on behalf of humans and take responsibility for their consequences. In addition, education should regard thinking as an organized and targeted learning and training process. Although artificial intelligence can provide solutions very quickly, it cannot replace people's analysis, processing, combination, and evaluation of various types of information in real life. In order not to degrade students' thinking ability, they must use ChatGPT properly. For people, the unstructured real world will not cause difficulties in semantic understanding, nor will it affect people's logical reasoning [8], but for ChatGPT, it cannot make reasonable ethical and moral judgments, so the result may contain many prejudices and stereotypes, which is not conducive to the establishment and maintenance of social community. Furthermore, in the context of ChatGPT usage, prompt is the process of designing the text of the prompt conversation model [9]. Since artificial intelligence cannot take the place of people's ability to make decisions and bear the consequences, in the future, education must cultivate students' decision-making thinking abilities in complex environments. "The degree of input from a researcher's domain expertise is a key factor in determining the quality of AI output," one researcher pointed out [10]. Only with deep professional competence and thinking skills can we avoid being misled by AI, evaluate the meaning of the results generated by ChatGPT, and communicate with AI more effectively, so that it can truly become a helper in education.

4.2.   Adjust Students' Mentality to Achieve Their Academic Goals

Generative AI instills a growth mindset by encouraging students to view uncertainty and failure as integral components of the learning journey. AI-generated scenarios might intentionally introduce uncertain elements, challenging students to navigate ambiguity with resilience and creativity. This shift in perspective fosters a willingness to experiment, take risks, and embrace failures as stepping stones toward growth. By embracing the iterative nature of learning, students become more resilient learners, unafraid to explore uncharted territories. While educational and academic ethics are relatively stable, they also need to be adjusted as new technologies emerge. In terms of teacher-student ethics, it is necessary for students to receive guidance from teachers because teachers are

familiar with the problems in the learning process. Under man-machine collaboration, the authority of teachers may be dissolved, which further intensifies the cognitive conflict between teachers and students. A successful teacher-student connection therefore hinges on how well both parties can manage their cognitive conflicts and how well students can work closely with both educators and artificial intelligence to enhance the overall teaching process. At the same time, since ChatGPT does not provide emotional support, teachers also need to focus on caring for students' physical and mental health and building emotional connections.

4.3. Strengthen Students' Motivation to Achieve Their Academic Goals

By simulating unpredictable scenarios, Generative AI prepares students to make informed decisions under ambiguity. These simulated scenarios mirror real-world situations where there are no predefined answers, forcing students to rely on critical thinking and decision-making skills. As students interact with AI-generated environments, they develop the confidence to take calculated actions in uncertain settings. This immersive learning experience bridges the gap between theory and practice, equipping students with practical problem-solving skills that are essential for navigating unpredictable real-world situations. For teachers and students, they should treat ChatGPT as a collaborative teaching partner, constantly make ChatGPT produce more high-quality advice through good human-computer communication, and make full use of the intelligent results generated by ChatGPT. In addition, both teachers and students must realize that although the development of artificial intelligence can bring convenience to work, it does not reduce the responsibility of both teachers and students in the teaching process, nor does it reduce the importance of both parties in human-machine collaboration, but rather requires teachers and students to participate in collaboration with artificial intelligence in a more effective way. Teachers cannot cede their roles and responsibilities in the teacher-student relationship to AI, and students cannot completely replace their own ideas with the results of AI. To this end, schools should provide systematic support, such as setting up courses or academic activities about ChatGPT, helping teachers and students to further contact and understand the application of this new technology and its deep impact on education, and building relevant data or technical platforms for teachers and students to better carry out academic planning with the assistance of artificial intelligence.

5. Conclusion

The profound impact of generative AI on high school students' academic planning is evident across course selection, learning methodologies, and academic goals. By recalibrating educational approaches, AI enables a thorough, flexible, and forward-looking education that equips pupils for the difficulties of a constantly changing environment. The use of Chat GPT generative artificial intelligence in education is a promising research field that is of great help to assist teachers in teaching and scientific research, improve the learning experience of high school students, and assist high school students in completing good academic planning. The "double-edged sword" characteristic of technology determines that it should maintain vigilance and evaluation of its limitations and risks. Despite the many risks and challenges that generative AI brings to education, it is still necessary to maintain an open and inclusive attitude towards technology, continue to optimize generative AI, and help the digital transformation of education.

By providing insights that feed ongoing research in this exciting area, this work contributes to the growing knowledge of AI's function in education. This paper lays the framework for additional investigation into the revolutionary potential of AI by looking at the junction of AI and academic planning. The learning and use of ChatGPT should be incorporated into the curriculum system of students and the training system of teachers and administrators, and evaluation standards should be

formulated to improve the digital literacy of the education system through systematic learning. On the other hand, encourage, support, and guide students, teachers, and administrators to use ChatGPT AI technology for academic planning. With the blessing of generative artificial intelligence technologies such as ChatGPT, digital literacy training and digital ability enhancement of students, teachers, and administrators will effectively promote the successful transformation of digital education in China.

Subsequent research could delve into the long-term implications of generative AI on students' career paths, ongoing learning strategies, and their roles as lifelong learners and problem solvers. A potential avenue for future investigation is examining the ethical and societal effects of AI in education.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

References

[1] State Council of the People's Republic of the China. (2014). The implementation opinions of the State Council on deepening the reform of examination and enrollment system.

[2] Cairns, L., & Malloch, M. (2017). Computers in education: The impact on schools and classrooms. Life in Schools and Classrooms: Past, Present and Future, 603-617.

[3] ChatGPT: Optimizing Language Models for Dialogue. Retrieved from https://openai.com/blog/chatgpt/#rf2.

[4] Mikropoulos, T. A., & Natsis, A. (2011). Educational virtual environments: A ten-year review of empirical research (1999–2009). Computers & education, 56(3), 769-780.

[5] Kahraman, H. T., Sagiroglu, S., & Colak, I. (2010, October). Development of adaptive and intelligent web-based educational systems. In 2010 4th international conference on application of information and communication technologies, 1-5. IEEE.

[6] Peredo, R., Canales, A., Menchaca, A., & Peredo, I. (2011). Intelligent Web-based education system for adaptive learning. Expert Systems with Applications, 38(12), 14690-14702.

[7] Hirsh-Pasek, K., & Blinkoff, E. (2023). ChatGPT: educational friend or foe?. Retrieved from https://www.brookings.edu/articles/chatgpt-educational-friend-or-foe/

[8] Marcus, G. and Davis, E. (2020) Rebooting ai: Building artificial intelligence we can trust. New York: Vintage Books.

[9] White. J, Fu Q, Hays S, et al. (2023-02-21). A prompt pattern catalog to enhance prompt engineering with ChatGPT. Retrieved from https://arxiv.org/abs/2302.11382.

[10] Dowling, M., & Lucey, B. (2023). ChatGPT for (finance) research: The Bananarama conjecture. Finance Research Letters, 53, 103662.