Research on Reform and Innovation of College English Teaching under the Background of Generative Artificial Intelligence

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Abstract. Generative artificial intelligence is a kind of artificial intelligence that can generate text, image or other media information according to the prompt. After the release of ChatGPT in November 2022, generative artificial intelligence has sprung up, and its application in health care, education, entertainment, finance and many other fields has greatly improved the productivity of the industry. This paper studies the innovative ideas of college English teaching reform under the background of generative artificial intelligence. The innovative application of generative artificial intelligence in college English teaching mainly includes teacher's teaching, student's learning, education evaluation and academic guidance. Under the background of generative artificial intelligence, we should make efforts to change the role of teachers, innovate the way of student evaluation, strengthen the construction of academic integrity, further stimulate students' learning motivation, and promote the high-quality development of college English teaching.

Keywords: Generative Artificial Intelligence, College English, teaching refor.

1   Introduction

OpenAI, an American artificial intelligence research company, released ChatGPT (Chat Generative Pre-trained Transformer), an intelligent dialogue tool based on large language models on November 30, 2022 [1]. Since its release, ChatGPT has become the focus of worldwide attention with its powerful AI-generated content. With the rapid development of information technology and the increasing maturity of artificial intelligence technology, generative artificial intelligence has gradually become one of the important directions of educational reform. Traditional English teaching methods have been difficult to meet the needs of modern personnel training. How to improve the teaching level and students' learning effect through the reform of college English teaching has been a hot topic in the field of English education. At present, due to the development of information technology, wisdom education has become one of the important directions of English teaching reform, and cultivating wisdom talents is the inevitable

trend of social development. There are many problems in college English teaching, such as students lack of intrinsic motivation and interest in learning, students think that English learning is difficult, and the learning process is very painful. Most of the students complete the teaching tasks assigned by the teacher mechanically and pass the exam in a coping way. In the process of learning, the mastery of knowledge only stays at the stage of memory. They cannot use language flexibly and lack the creative development ability of thinking. Although many teaching strategies have effectively solved some of the problems, students' intrinsic enthusiasm for learning still needs to be stimulated and promoted in order to achieve good results in college English teaching. Through the construction of relaxed and novel teaching activities, students can be provided with more learning ideas [2]. This paper aims to explore the innovative research of college English teaching reform under the background of generative artificial intelligence, in order to improve the level of college English teaching and improve college students' English listening, speaking, reading and writing ability.

2   Concept And Development Of Generative Artificial Intelligence

2.1   Basic Concept

Generative artificial intelligence (GAI) is an artificial intelligence that can generate text, images, or other media information based on prompts. Its principle is to use machine learning technology to generate new text, program code, image, video and sound data on the basis of existing large-scale multi-modal data sets, and to have the ability to deal with a variety of tasks and scenes [3]. In today's digital age, generative artificial intelligence has become the frontier of science and technology and business, bringing us unprecedented innovation and opportunities. The rapid development of generative artificial intelligence technology has not only improved productivity, but also set off a revolution in health care, education, entertainment, finance and many other fields. Generative AI solutions are expected to reach globally recognized maturity in five years, and enterprises that take the lead in adopting generative AI technology will benefit the most from reshaping business models and processes. Figure 1 is a forecast chart of the market scale of China's generative AI industry. China's generative artificial intelligence industry is expected to reach a trillion-level scale in 2030.
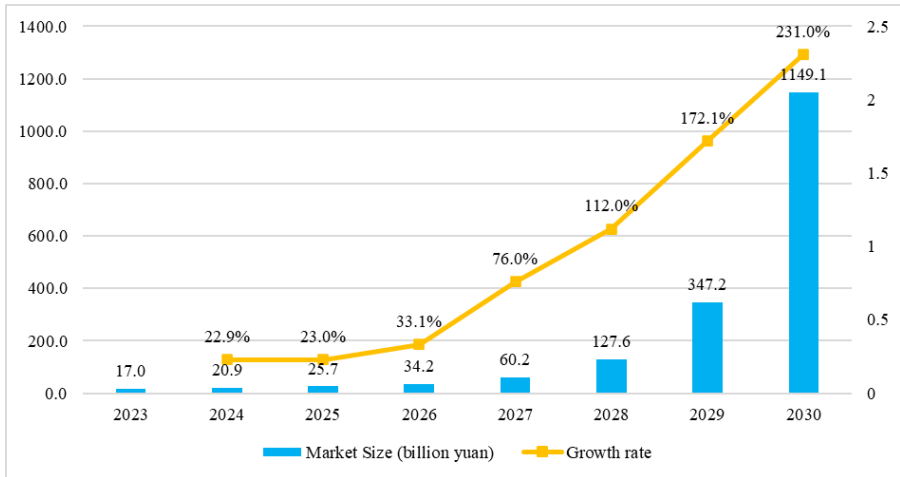
Fig. 1. Market size prediction of generative artificial intelligence industry of China (figure credit: http://news.sohu.com/a/754637979_121834026)

The Ministry of Education of China held a press conference to introduce the preparations for the 2024 World Conference on Digital Education and the progress of promoting the digitalization of education in the past year on January 26, 2024. The meeting pointed out that the innovative application project of generative artificial intelligence in colleges and universities will be implemented to promote the application of generative artificial intelligence in relevant professional fields, upgrade the national intelligent education platform with artificial intelligence, and realize personalized push and intelligent search of resources [4].

2.2   Development Process

The development of generative artificial intelligence can be traced back to the 1960s, when the first computer-composed musical work, the Eliak Suite, was created in 1957. 2022 is considered to be the year of AI's great awakening. The release of DALL-E 2, Stable Diffusion, ChatGPT and other models marks a significant breakthrough in the generation of content by generative AI. ChatGPT is a chat robot developed by OpenAI and launched on November 30, 2022. It is a large language model based on GPT-3.5 architecture and trained through reinforcement learning. It uses deep learning technology to generate natural language responses related to input text by learning and training a large amount of text data. Chat GPT is an important application of generative artificial intelligence in the field of natural language processing. It shows the great potential of generative artificial intelligence in processing and generating human language. By using generative artificial intelligence technology, Chat GPT can understand the user's input and generate the corresponding reply to realize the dialogue interaction with human beings. The success of Chat GPT also promotes the development and application of generative artificial intelligence technology. It provides a new tool and platform for

the research and development of natural language processing, dialogue system, intelligent customer service and other fields. China's generative artificial intelligence has also made a breakthrough in 2023. Generative artificial intelligence applications such as ERNIE Bot of Baidu, Spark of Xunfei, Qwen-7B of Ali and Huanyuan of Tencent are constantly emerging [5]. With the continuous development of technology, the application scenarios and functions of generative artificial intelligence in China are also expanding and deepening.

3   Innovative Application Of Generative Artificial Intelligence In College English Teaching

Based on the core competencies of GAI, such as heuristic content generation, dialogue situation understanding and sequential task execution, we sort out the potential educational applications that different core competencies can support from the four typical educational links of teaching, learning, evaluation and assistance, as shown in Figure 2.

	Teach	Learn	Evaluate	Guidance
Inspirational content generation	Creative material generation	Human machine collaboration	Student work evaluation	Knowledge Exploration
Dialogue context understanding	Teaching process support	Subject knowledge Q&A	Evaluation of expressive ability	Diagnosis of learning problems
Sequential task execution	Course design plan	Teaching bracket feedback	Writing ability evaluation	Difficult problem analysis

Fig. 2. Innovative Application of Generative Artificial Intelligence in College English Teaching (figure credit: original)

3.1   Teacher's Teaching

Generative artificial intelligence can provide various forms of help and services for teachers' teaching. Based on the ability of heuristic content generation, generative artificial intelligence can generate creative teaching materials according to the teaching objectives of teachers, and assist teachers to design innovative teaching activities; based on the ability of dialogue situation understanding, generative artificial intelligence can play the role of assistant in classroom teaching, and provide interactive support for teachers in the teaching process according to the current teaching situation [6]. Based on the ability to execute sequential tasks, generative artificial intelligence can generate personalized teaching programs according to the teaching scenarios and the teaching

needs of individual teachers. Specifically, in the process of assisting teachers to form personalized teaching plans, generative artificial intelligence can generate a variety of appropriate teaching designs step by step according to teaching needs, provide teachers with ideas and alternatives in the process of preparing lessons, and improve teachers' efficiency in preparing lessons and teaching quality. College English teachers can use generative artificial intelligence to analyse student's learning history and hobbies, and design personalized curriculum plans for each student. For example, for students who like to watch movies, teachers can design a series of courses related to movies for them, including the study of movie lines, listening training, oral expression, etc., in order to improve interest in learning and effectiveness. College English teachers can use generative artificial intelligence to generate lesson plans and teaching materials. For example, they can use AI language models to generate reading materials, listening materials, writing topics and grammar exercises. These generated materials can be tailored to the level and needs of students to ensure that the instructional content is more personalized and effective.

3.2   Student's Learning

Generative artificial intelligence can also provide good support and services for the learning process. Based on the ability of heuristic content generation, generative artificial intelligence can automatically generate model paragraph examples or heuristic ideas, provide creative writing materials for students, and assist students to write in the way of human-computer collaboration. Based on the ability of dialogue situation understanding, generative artificial intelligence can identify student's learning situation and provide students with context-based subject knowledge questions and answers combined with subject professional knowledge; based on the ability of sequential task execution, generative artificial intelligence can provide students with dynamic teaching scaffolding and feedback according to their learning needs and knowledge mastery, and optimize their learning path; Based on the ability of program language analysis, generative artificial intelligence can recommend relevant code fragments and running analysis for students according to their actual needs and programming tasks, and help them understand the design ideas and writing methods of programs efficiently. Specifically, in the process of supporting subject knowledge question-and-answer, generative artificial intelligence can provide students with multi-level services such as phenomenon analysis, knowledge point explanation, application influence and so on based on multi-round dialogue [7]. College students can use the generative artificial intelligence writing aid, which can generate a grammatical and logical English article according to the theme and requirements input by the user. By reading the generated article, and found that there are some grammatical and word errors, and the article was revised and improved. By using the generative artificial intelligence writing AIDS, students not only improve their English writing ability, but also learn some new vocabulary and expressions. Generative artificial intelligence can provide students with more intelligent, personalized and autonomous learning experience, and improve their learning efficiency and quality.

3.3   Educational Evaluation

In college English teaching, we can use generative artificial intelligence technology to assist teaching evaluation. Specifically, we can use generative artificial intelligence technology to automatically correct and grade students' English compositions, automatically evaluate and feedback students' oral expression, analyse and evaluate students' learning, and then give corresponding suggestions and feedback [8]. Generative artificial intelligence-assisted teaching evaluation can automatically complete some tedious work, such as correcting compositions and evaluating oral expression, so as to improve teaching efficiency. Generative artificial intelligence-assisted teaching evaluation can give corresponding suggestions and feedback according to students' learning situation and problems, and help students learn better and improve their English level. Generative artificial intelligence assisted teaching evaluation can timely feedback students' learning situation and achievements to stimulate students' learning enthusiasm and motivation. Based on the ability of heuristic content generation, generative artificial intelligence can objectively comment on works and answers, guide students to explore the advantages of works and provide ideas for improvement. Based on dialogue situation understanding ability, generative artificial intelligence can evaluate students' language expression ability, and give targeted feedback suggestions by analysing student's vocabulary, grammar, sentence structure, opinion expression and event description in the process of dialogue. Generative artificial intelligence can help college English teachers evaluate students' learning. For example, by analysing student's homework, test scores, oral expression and other data, generative AI can provide teachers with students' learning reports and suggestions, help teachers better understand students' learning situation and needs, so as to adjust teaching plans and methods.

3.4   Academic Guidance

GAI can also try to complete more complex and professional academic guidance tasks. Based on the heuristic content generation ability, generative artificial intelligence can generate targeted resources and materials, guide students to understand knowledge points from different perspectives, and assist students to enhance their knowledge exploration and innovation ability. Based on the ability of dialogue situation understanding, generative artificial intelligence can understand the actual needs of students according to historical dialogue information, and provide personalized learning support for students combined with current learning content. Based on the ability of sequential task execution, generative artificial intelligence can analyse student's difficult problems step by step, and help students understand the key points and difficulties of problem solving. Generative artificial intelligence can provide personalized tutoring for each student according to their English level, learning style and hobbies. For example, it can provide students with reading materials and vocabulary exercises suitable for their level according to their reading comprehension ability and vocabulary. Generative artificial intelligence can help students improve their English writing ability. It can provide writing prompts, grammar and spelling checks, and feedback and suggestions to help students improve their writing. Generative artificial intelligence can help students

improve their oral English. It can provide oral practice, feedback on pronunciation and intonation, and simulated conversations to help students better understand and express English. Generative artificial intelligence can help students improve their English listening ability. It can provide listening exercises, annotations and explanations of listening materials, as well as feedback and suggestions to help students better understand English listening materials. Generative artificial intelligence can help students complete their English homework. It can provide tips, answers and explanations, as well as feedback and suggestions to help students better complete their English assignments.

4   Suggestions on College English Teaching Reform Based on Generative Artificial Intelligence

4.1   Transform Teacher Role Orientation

In the reform of college English teaching based on generative artificial intelligence, the change of teachers' role is a crucial link. In the traditional teaching mode, teachers are usually the imparters of knowledge, but in the context of generative artificial intelligence, teachers need to play more roles as learning guides and collaborators. As a learning guide, teachers should help students understand and master generative artificial intelligence technology, and guide them how to use this tool for autonomous learning [9]. Teachers can introduce students to various learning resources and platforms, and guide them how to choose their own learning content and methods. In addition, teachers can also design teaching activities and tasks to stimulate interest and initiative in learning and cultivate their autonomous learning ability. As a cooperator, teachers need to establish an equal and interactive cooperative relationship with students. Teachers can organize group discussions, cooperative learning and other activities to encourage students to share their learning experiences and achievements, and promote interaction and cooperation among students. In this process, teachers can not only provide guidance and support, but also constantly improve teaching methods and content from the feedback of students. In addition to the above two points, teachers also need to constantly improve their professional quality and teaching ability. With the continuous development of generative artificial intelligence technology, teachers need to understand and master new teaching tools and methods in time, and integrate them into teaching practice. At the same time, teachers should also actively participate in teaching research and innovation, share experience and achievements with their peers, and promote the sustainable development of college English teaching reform. The change of teachers' role is the key to the reform of college English teaching. Only when teachers actively adapt to the new teaching environment and requirements, can they better cultivate students' comprehensive English application ability and lay a solid foundation for their future study and work [10].

4.2   Innovate Student Evaluation Model

Although the traditional paper-and-pencil test is important, it cannot fully reflect the students' English ability. Using generative artificial intelligence, we can increase oral expression, writing, listening comprehension and other evaluation methods to better examine student's practical application ability. Generative artificial intelligence can provide real-time evaluation and feedback for students. Students can immediately understand their own performance and get targeted advice, which will help them adjust their learning strategies in time and improve their learning results. Every student's learning pace and needs are different. Through generative artificial intelligence, students can be evaluated according to their personal situation, providing them with tailor-made feedback and suggestions to promote their individual development [11]. Using generative artificial intelligence, teachers can organize students to study and evaluate in groups. Students can evaluate each other's performance and develop a spirit of cooperation and critical thinking. Innovative evaluation methods should not only pay attention to evaluation of students, but also cultivate students' independent evaluation ability. Through GAI, students can better understand their own learning process, find their own strengths and weaknesses, and thus improve their self-management and learning ability. English learning is not only the cultivation of language skills, but also involves cross-cultural communication and other disciplines. Innovative evaluation methods can combine English with other disciplines to examine student's English application ability in interdisciplinary situations. In a word, the reform of college English teaching based on generative artificial intelligence needs innovative evaluation methods to better meet the needs of modern education. Through diversified, real-time, personalized, cooperative and interdisciplinary evaluation methods, we can stimulate students' learning enthusiasm, improve the quality of teaching, and cultivate talents with global vision and cross-cultural communication ability.

4.3   Strengthen Academic Integrity Construction

In the process of college English teaching reform based on generative artificial intelligence, it is very important to strengthen the construction of academic integrity [12]. With the development of artificial intelligence technology, students may face more temptations when completing homework and exams. Therefore, we need to take a series of measures to strengthen the construction of academic integrity to ensure the fairness of education and academic purity. Teachers should emphasize the importance of academic integrity in the teaching process, so that students understand the seriousness of plagiarism and cheating. At the same time, college English teachers can use artificial intelligence technology to detect student's homework and exams, and find and deal with plagiarism and cheating in time. Schools can establish a sound academic integrity system and seriously deal with violations of academic integrity. This can not only serve as a warning, but also maintain the academic reputation of the school. Teachers can also guide students to use AI technology correctly and avoid students relying too much on the content generated by AI. College English teachers can encourage students to think independently and innovate, and cultivate students' creativity and critical thinking

ability. At the same time, generative artificial intelligence may inhibit student's rational thinking, questioning spirit, imagination, emotional experience and creativity, and weaken their ability to choose independently. Generative AI may lead to the end of academic integrity in online and open exams, according to research reports. The answers given by generative AI show a high degree of critical thinking and logical ability, and can generate highly realistic content with little input, making it possible to cheat in exams. Therefore, before using a large number of generative artificial intelligence tools, we should strengthen the academic moral education of students and reduce the risk of academic integrity that may arise from generative artificial intelligence.

5   Conclusions

Generative artificial intelligence brings new opportunities and challenges to the reform of college English teaching. Under the background of generative artificial intelligence, college English teaching should pay attention to the cultivation of students' active participation and creativity, and make full use of the personalized learning function of generative artificial intelligence. In the context of generative artificial intelligence, we should strive to change the role of teachers, innovate student evaluation methods, and strengthen the construction of academic integrity. Through these innovative measures, we can better promote the development of college English teaching and improve English ability.

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