An Empirical Study of AIGC enabled High School English Listening Class in China

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Abstract: With the rapid development of AIGC (Artificial Intelligence Generated Content) technology, it is increasingly widely used in education. This study investigates the effectiveness of AIGC technology in high school English listening classes. By comparing the changes in English listening levels in the experimental group (AIGC technology-assisted teaching) and the control group (traditional listening teaching method), SPSS software was analyzed to verify the positive influence of AIGC technology on students' English listening ability. The research results show that AIGC technology can significantly improve students' listening levels, and has a positive impact on stimulating students' interest in learning and enhancing teaching efficiency.

1. Introduction

In the context of globalization, the importance of English as a key tool of international communication is obvious. As one of the core skills of English learning, the teaching effect of listening directly affects students' comprehensive language application ability. However, traditional listening teaching methods often face challenges such as single content and insufficient interaction, which makes it difficult to stimulate students' enthusiasm and enthusiasm for learning. In addition, due to the limitation of teacher resources and teaching materials, the traditional English listening teaching mode makes it difficult to meet the needs of students' personalized learning. With the rapid development of science and technology, artificial intelligence-generated content (AIGC) technology is more and more widely used in the field of education. Especially in the field of language learning, AIGC technology has greatly enriched teaching resources and improved learning efficiency by providing personalized and interactive learning content. Therefore, this study aims to integrate AIGC technology into high school English listening classes, hoping to improve students' English listening skills by providing a rich variety of listening materials and intelligent teaching AIDS. Meanwhile, this study will use empirical research methods to evaluate the application effect of AIGC technology in high school English listening teaching, aiming to provide a useful reference for the field of English teaching.

2. Literature Review

AIGC technology, as a cutting-edge technology using machine learning and deep learning algorithms, is committed to creating multi-form content through automated processes. The technology covers a wide range of advanced areas such as natural language processing (NLP), computer vision, speech synthesis, and generative adversarial networks (GANs). The core of AIGC technology is its ability to simulate human creative thinking, thus being able to produce both high-quality and diverse content [1]. In recent years, AIGC technology has made remarkable achievements in the field of content generation, especially the GPT series model launched by OpenAI, whose outstanding performance in text generation has set a new benchmark for the industry **Error! Reference source not found.**. The application of AIGC technology in education has covered many aspects, including the generation of personalized learning resources, the development of automatic evaluation systems, and the design of interactive learning tools. AIGC technology can generate personalized learning materials based on students' learning progress and abilities. A group of academic researchers have been developing this intelligent English tutoring system to support English teaching. For example, Eger has evaluated some popular pronunciation intelligent English tutoring systems in ESL classes in Canada that only focus on segmentation rather than pronunciation **Error! Reference source not found.**. They believe that AI technology can assist English teachers in terms of pronunciation and different accents. In addition, some experts introduced three existing intelligent tutoring systems that may assess the vocabulary ability of English learners, namely the Vocabulary Levels Test, and the developed test Vocabulary Size Test and network-based diagnostic system [1]. However, these three intelligent tutoring systems are limited to written media and only focus on a single

word, not considering the context of the words. Erickson and Siau experimented with enhancing English language proficiency among 746 users **Error! Reference source not found.**. Fancy, an AI app designed for Chinese English learners, was similar to Duolingo. The results showed that 72% of users spent about two months and improved their test scores. In addition, Jiang R studied the efficacy of providing error correction feedback systems based on AI and compared the effect difference between the two types of error correction feedback **Error! Reference source not found.**. The results showed that the majority of students favored the efficacy and quality of the system, reflecting that AI technology can support reducing the workload of teachers and administrators.

In English teaching, teachers are still dominant. With the development of artificial intelligence technology and the expansion of the English teaching database, artificial intelligence can help English teachers teach and learners learn to a large extent because its efficiency and role can replace the status and functions of teachers in some specific areas of English teaching. For example, English teachers can be relieved from the basic and repetitive work of teaching grammar rules and pronunciation year after year, interpreting reading and listening articles, providing writing and speaking structures and demonstrating answers, and analyzing students' performance. At the same time, artificial intelligence can also assist teachers in teaching management, such as preparing lessons, preparing teaching materials, designing classroom activities, scoring, assigning and reminding homework, sending notices, recording attendance, and so on. With the help of AI tools, English learners can also teach themselves pronunciation, vocabulary, grammar, reading, listening, writing, and spoken English anytime and anywhere. College English teaching has also been promoted in the context of artificial intelligence technology technique of reading has received positive reviews to help students achieve accurate assessment and feedback on multiple phonemes **Error! Reference source not found.**. Through practical cases, ChatGPT demonstrated how to improve the teaching level of English teachers and the ability to publish academic papers, improve students' English learning efficiency and overall quality, and enhance the quality and diversity of teaching materials.

To sum up, the application of AI technology, both to learners and teachers, can enable them to pursue better results, and generate the motivation to use AI teaching and assisted learning.

3. Methodology and Procedures

3.1. Study Subjects

This study selected two parallel classes from No.36 Middle School in Zhongyuan District, Zhengzhou City, totaling 100 students as the research subjects, among which the experimental group and the control group were composed of 50 students each. All participating students showed no significant differences in key variables such as age, gender, and English base, and they had passed the pretest to ensure their English listening level was comparable. Students in the control group adopted the traditional listening teaching method, while students in the experimental group received additional listening training supported by AIGC technology in addition to conventional listening teaching.

3.2. Research Tools

With the help of SPSS 2 2.0, this study uses rigorous descriptive analysis, t-test analysis of variance, and other means to conduct an in-depth analysis of the collected data and strive to make the scientific and research results accurate.

3.3. Experimental Design

Sample selection process: In Zhengzhou No.36 Middle School, there are six natural classes. To conduct an educational experimental study, the researchers decided to select two classes with the smallest performance difference as the research object. After careful comparison and screening, the two classes designated as numbered C1 and C2 were finally identified. Among them, Class C1 was selected as the experimental class, and Class C2 served as the control class. Both classes are taught by the same English teacher to ensure the consistency of teaching methods and teaching content. In addition, to ensure the scientific nature and accuracy of the experiment, the number of students in each class is strictly controlled within 50 students.

In the process of selecting these two classes, the researchers also paid special attention to the comparability of the two classes in terms of student size, gender ratio, age distribution, etc. This means that classes C1 and C2 should have similar characteristics on these key background variables to

ensure the validity and reliability of the experimental results. With such careful selection and control, the investigators hope to minimize the interference with experimental results and more accurately evaluate the effects of experimental interventions.

Preparation of teaching materials: Experimental group: In the intelligent classroom of the school, we introduced the English listening assistant agent in the iFlytek Spark platform, as an important auxiliary tool in the teaching process. First, the teacher gave special training to the students, explaining in detail how to use the correct instructions to have an effective dialogue with the agent, to ensure that the students can make full use of this technology. Then, we use advanced artificial intelligence-generated content (AIGC) technology to elaborate a rich variety of voice materials. These materials not only cover listening exercises with different levels of difficulty, different speeds, and various accents but also include dialogue models that simulate real dialogue scenarios. These simulation questions can adjust the difficulty and theme in real-time according to the accuracy of students, to meet the personalized learning needs of each student. In addition, the agent can also intelligently score students' performance, and provide personalized learning advice to help students better master English listening skills, to improve their language application ability.

Control group: In traditional English listening teaching, teachers usually prepare some traditional teaching materials, such as audio tapes and listening exercises. These materials usually include exercises with fixed difficulty and topics, lacking real-time adjustment and personalized feedback. This traditional teaching method often fails to meet the personalized needs of each student, making it difficult for students to obtain targeted guidance and help in the process of listening learning.

Technology and equipment preparation: In the experimental group class, students do targeted exercises three times a week using the smart classroom equipped with the school. To ensure that these exercises go smoothly, the classroom is equipped with a stable Internet connection, allowing students to make full use of AIGC technology for teaching and practice activities. To ensure that students are skilled in using these technologies, the school has also trained students in advance, especially for the personalized listening learning function for the iFlytek Spark platform. Students have learned how to operate and use these tools in the training to be more comfortable in the actual learning process.

The entire experimental cycle is set for a semester, during which both the experimental and the control groups receive normal English listening instruction. However, students in the experimental group have additional opportunities to use AIGC technology on this basis, thus gaining more support and resources in listening learning. In this way, schools hope to observe and evaluate the actual effect of AIGC technology in English listening teaching, and its specific impact on students' learning effectiveness.

4. Research Results

4.1. Analysis of the Experimental Class

The data of the English test scores of the experimental class are analyzed, and the average score of the test obtained is shown in Figure 1.
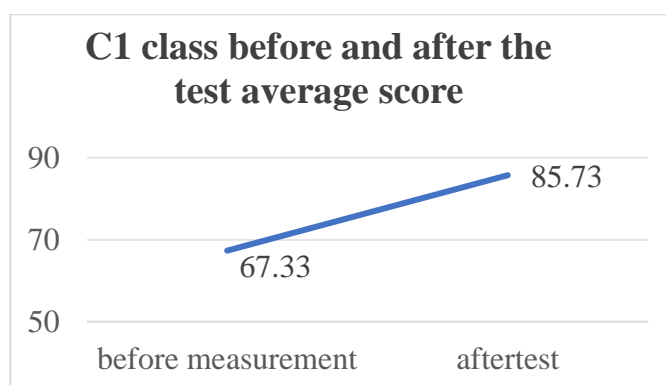
Figure 1 Comparison of the average scores before and after Class C1

As shown in Figure 1, the average listening score of the experimental class was greatly improved with the assistance of AIGC. The results of the paired sample T test before and after the scores of class C1 are shown in Table 1.

Table 1 Comparison of test differences before and after Class C 1

Class type	Pre-test (n=50)	Pre-test (n=50)		
C1	67.33±11.06	85.73±8.45	3.98	**

* * Represents a p-value of less than 0.01

As can be seen from the above table, there is a significant difference in the C1 class test (t=3.98 p <0.01), and the performance improvement of the experimental class is significant.

4.2. Analysis of the Difference Before and After the Control Class

The comparison chart of the average scores before and after the C2 class is shown in Figure 2. The average score of the control class was small, and the relevant ability of students did not change significantly, so the overall level remained similar.

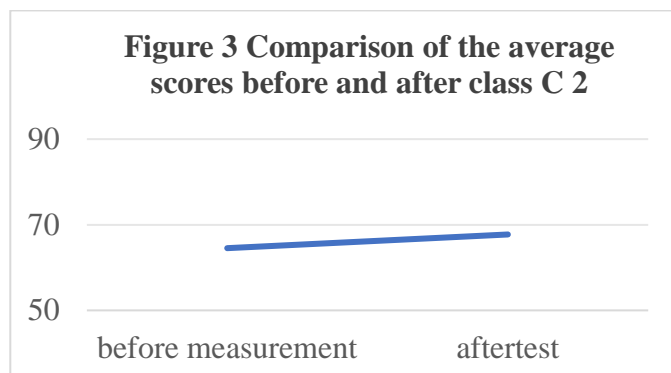**Figure 3 Comparison of the average scores before and after class C 2**

Figure 2 Comparison of the average scores before and after class C2

The paired sample T-test of the data before and after the English test results are shown in Table 2.

Table 2 Comparison of test differences before and after class C2

Class type	Pre-test (n=40)	Pre-test (n=40)	T
C2	64.53±12.10	867.73±10.43	0.7

As can be seen from the above table, there was no significant difference in the C2 class test (t=0.70 p> 0.05), and the performance of the students in the control class improved slightly, but the improvement effect was not obvious.

4.3. Analysis between the Experimental Class and Control Class

The average score of the pre-test of the experimental class was 67.33, and the average score of the control class was 64.53 before the test. After the AIGC classroom teaching experiment of the same time, the average score of the experimental class was 85.73, the average score of the control class was 67.73, and the average score of the experimental class was greatly improved.
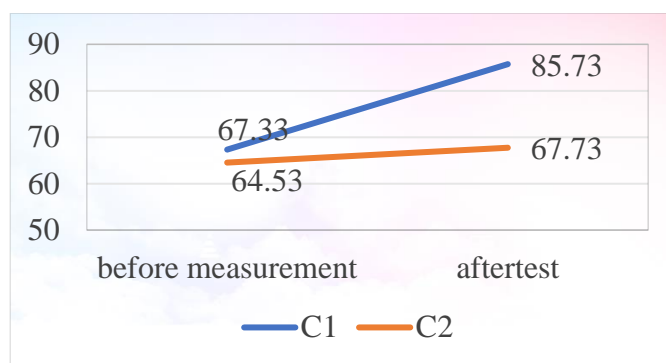

Figure 3 Before and after class C1 and C2

Table 3 Comparison of test differences between classes

Test Group	Class C1 (n=40)	Class C2 (n=40)	T
Pre-test results	67.33±11.06	64.53±12.10	0.92
Post-test results	85.73±8.45	67.73±10.43	3.27**

* * Represents a p-value of less than 0.01

The results of the control class and experimental class before and after test, and the results are shown in Table 6. There was no significant difference between the two classes in the pre-test (t=0.92 p> 0.05), and the significant difference between the pre-test (t=3.27 p <0.01). It can be seen that the classroom teaching strategy of AIGC adopted by the experimental class effectively improved the efficiency of the English classroom, thus greatly improving the student's performance at the same time.

Through the comparative analysis of the before and after test scores and the results of the experimental class and the control class, we can see that the classroom teaching strategy of AIGC assisted English listening adopted by the experimental class has shown a significant effect in improving the efficiency of the English classroom. This strategy allows students to achieve greater performance improvement in the same amount of time. Specifically, the performance in the post-test of the experimental class is significantly improved compared with the pre-test, and the improvement range is large, while the difference between the average score before and after the test of the control class is not significant. Although the average score of the experimental class and the control pretest class was almost the same before the start of the experiment, the improvement effect of the post-test

score of the experimental class was particularly prominent after the same teaching time. Further through the difference test of the pre and post-test data, we found that there were significant differences in the data of each dimension, and the average value of the post-test data was higher than that of the pretest data. This result fully shows that the effect of the AIGC assisted high school English listening classroom teaching strategy is significantly better than the traditional classroom teaching methods, thus showing a more significant advantage in improving students' English performance.

5. Conclusion and Suggestions

In this study, we carefully analyzed and evaluated the changes in English listening levels in the experimental and control groups. The experimental group introduced the AIGC technology in the high school English listening class, while the control group used the traditional teaching methods. Through a series of tests and assessments, we found that the students in the experimental group have made significant progress in English listening. Specifically, the experimental group of students' listening comprehension ability, vocabulary recognition speed, and grasp of the complex sentence structure ability have been significantly improved.

The results further show that the application of AIGC technology in high school English listening classes not only improves students' English listening level but also stimulates their interest and enthusiasm for English learning. Students generally reflect that AIGC technology makes listening exercises more vivid and interesting, and can better attract their attention, thus improving learning efficiency. In addition, AIGC technology also provides teachers with more teaching resources and means, making classroom teaching more diversified and personalized.

Given the remarkable effect of AIGC technology in improving students' English listening levels, as well as its wide recognition and welcome among students, we strongly recommend actively promoting and applying AIGC technology in high school English listening teaching. In this way, it can not only effectively improve students' English listening ability, but also further cultivate their comprehensive quality, laying a solid foundation for their future study and life.

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