



## IMPROVE ENGLISH LEARNING THROUGH ARTIFICIAL INTELLIGENCE FOR ONLINE AND OFFLINE MIXED TEACHING PATH

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**Abstract.** With the development of higher education in China, English has been listed as a compulsory course in basic education, and people's demand for English teaching level is also increasing. However, with the advent of the information age, there have been significant changes in the dissemination of knowledge, teaching methods, and teaching environment. Traditional English teaching models can no longer meet the requirements of modern society for versatile talents. Therefore, exploring the mixed online and offline English teaching path has become particularly important. Artificial intelligence (AI) is an advanced technology today. It can evaluate students' pronunciation and provide corresponding guidance, thereby increasing students' interest in English and improving English pronunciation accuracy. It can also provide personalized learning content and learning paths according to students' learning needs and levels. By analyzing students' learning situation and feedback, it automatically adjusts and optimizes learning resources so that students can better master English knowledge and skills. The traditional English teaching model is often limited by time and space, while the AI-based hybrid teaching model can integrate a variety of educational resources around the world, including high-quality course content, learning resources and online tutoring services, so that students can get the most suitable educational resources anytime and anywhere, which can improve learning efficiency.

**Key words:** Artificial Intelligence, Speech Recognition Technology, Mixed Teaching, English Teaching

**1. Introduction.** In the context of global economic integration, students must proficiently master English skills in order to achieve higher levels of development. In English teaching, teachers should recognize the current development trends and teaching changes, and reflect on the shortcomings of traditional teaching models. By establishing a blended teaching model of "online+offline" in English, English teaching can exhibit a completely different new style from the past and achieve greater development in the new era. People should extend the application of AI to the field of education, and language is the proudest of mankind. Whether it is natural language processing, machine translation, speech recognition, or other AI technologies, language learning is indispensable. Applying AI to English teaching would be an important breakthrough in the field of online and offline hybrid teaching of English. In practice, "flipped classroom model" is a common and widely practiced blended learning style. Flipped classroom mode refers to the transfer of traditional classroom teaching content to the online learning platform, and the practice, exploration and discussion and other activities are carried out in the classroom. In this mode, students can independently learn relevant knowledge and concepts through online learning resources (such as videos, textbook readings, etc.) before class. Then, in class, students interact with peers and teachers to engage in practical activities such as problem solving, case studies, and experimental operations to deepen understanding and apply what they have learned.

The rapid development of information technology has had a profound impact on human life and work, and has brought unprecedented changes to English teaching. However, simple classroom teaching can no longer meet students' learning needs, so it is imperative to carry out blended English teaching. Albiladi Waheeb proposed that blended learning is a relatively new field, which combines traditional distance learning and online learning methods. Blended learning can be effectively used to develop language skills and improve the English learning environment, thus promoting students' language learning [1]. Millorpe Naomi introduced a cooperative teaching project in English courses, called "Mixed English", which involves the use of online and mobile technology to develop, implement and evaluate learning and teaching activities for students' English units. The hybrid approach he described has the ability to enhance subject learning and increase enrollment opportunities for students in remote areas, thereby promoting deeper academic research [2]. Huang found that in recent years, blended learning has become a popular teaching model at all levels of education and

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in different disciplines. He believed that from education to the role of teachers, there are paradigm shifts in different areas of blended learning. He studied how students view their teachers' role in blended English learning. The results showed that in the eyes of students, teachers have more influence in blended learning than in online learning [3]. Ginaya Gede described a structured attempt to investigate the impact of blended learning and traditional teaching on students' oral proficiency. By analyzing the results before and after the test through planning, action, and observation, the survey results showed that students who participated in blended learning significantly improved their English-speaking ability and enhanced their learning motivation and interest [4]. Sari aimed to reveal the advantages of blended learning and students' motivation for learning English. Blended learning combines the positive aspects of the traditional model with improved technology to maintain, improve and attract students' enthusiasm and participation. Blended learning improves access to materials and learning activities, which can support and strengthen the role of teachers, students' experience and social environment [5]. The immersive teaching model of the flipped classroom is indispensable in blended and online language learning. Using a quasi-experimental design, Yulian R conducted pre-test and post-test paired T-test for critical reading. The participants were 37 second-semester students in an academic English class. The results showed that flipped classroom teaching model improved students' critical thinking from the pre-test average (12.4865) to the post-test average (18.3243). In terms of self-directed learning, students have a positive view of the implementation of the model [6]. Based on the cloud computing artificial intelligence model, Liang X made an in-depth summary and analysis of the interactive English teaching mode, explored the characteristics of intelligent classrooms, and practiced the reform of the interactive teaching mode. According to the investigation results, the construction of artificial intelligence course teaching model is optimized to make it more perfect. Based on cloud computing technology, the system architecture and functional module division of online open course platform are designed according to the overall demand, and the development and implementation are carried out on this basis [7].

The above scholars believed that the application of blended learning mode in practical teaching can improve the quality of English teaching.

Introducing AI technology into English blended learning is a practical approach. AI is a discipline that studies how to use computers to simulate human intelligence. With the development of modern computer technology and the rapid advancement of social informatization, people have increasingly focused their attention on the application of AI in real life. There is no doubt that the application field of AI should be expanded from the perspective of education. How to effectively teach English has become a consensus among many linguists and a problem faced by many teachers and students. In summary, the application scope of AI urgently needs to be extended to the construction of English teaching paths, and the construction of blended English teaching cannot be separated from the promotion of AI.

**2. Construction of English Blended Teaching Based on AI.** In the new era, students' learning status and enthusiasm have undergone significant changes, and their dependence on smart devices such as mobile phones has become increasingly strong, bringing new challenges to traditional English teaching.

In blended learning, various types of AI tools can be used to assist the teaching and learning process. The virtual experiment platform enables students to operate and observe experiments and gain practical experience by simulating experiment environment and virtual experiment equipment. AI based blended learning refers to the combination of online learning and offline traditional classroom teaching. Before class, teachers would formulate the content they want to learn into preview tasks, and then send them to students on online platforms [6, 7]. Students can use online platforms to engage in online learning. When they encounter problems, they can communicate and discuss with teachers and classmates at any time, and can solve these problems in a timely manner. In the offline teaching stage, teachers can provide centralized answers to common problems that students encounter in online learning and engage in deeper discussions on these issues.

Blended teaching can effectively mobilize students' subjective initiative and expand limited in class knowledge to unlimited extracurricular knowledge, thereby achieving the goal of improving teaching quality [8, 9]. This article constructed blended English teaching from three perspectives: pre class collaborative preview, in class teacher-student interaction, and post class collaborative expansion, which integrated online and offline teaching and promotes each other. The English blended teaching based on AI is shown in Figure 2.1.

As can be seen from Figure 2.1, with the rapid development of artificial intelligence technology, traditional

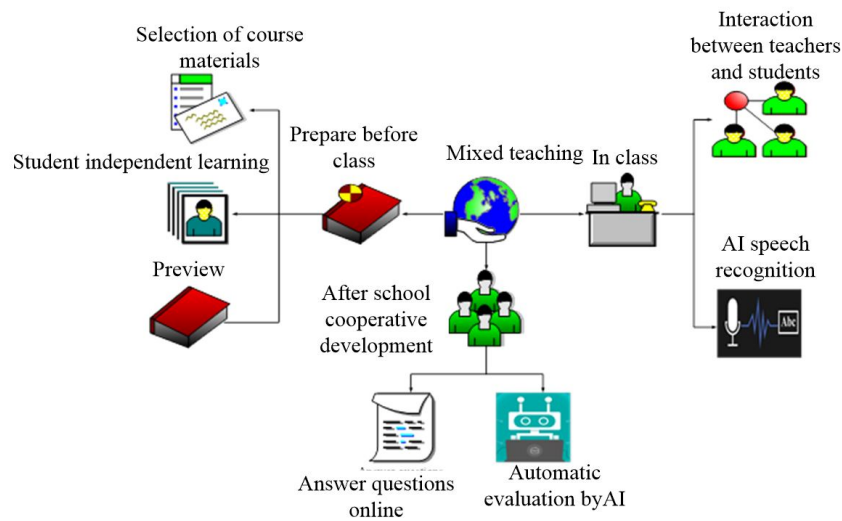


Fig. 2.1: Schematic diagram of AI based blended English teaching

English teaching is gradually shifting to a hybrid teaching method combining online and offline. Teachers can easily use the network platform to carry out teaching activities, so as to complete the comprehensive integration and storage of digital media resources, as well as teaching activities such as answering questions and correcting homework after class. In blended learning, students can easily preview, study in class, review after class, interactive discussion, online question and answer and other processes [10, 11]. The blended teaching based on online and offline teaching not only gives full play to the comprehensive supervision and guidance role of teachers, but also fully considers the needs of students' independent learning [12].

In Figure 2.1, with the rapid development of AI technology today, traditional English teaching is gradually shifting towards a hybrid approach that combines online and offline teaching. Teachers can conveniently use online platforms to carry out teaching activities, thereby completing the comprehensive integration and storage of digital media resources, as well as teaching activities such as answering questions and correcting homework after class. In blended learning, students can easily engage in preview, classroom learning, after-school review, interactive discussions, online Q&A, and other processes [10, 11]. The blended teaching based on online and offline teaching not only fully utilizes the comprehensive supervision and guidance role of teachers, but also fully considers the needs of students' autonomous learning [12].

## 2.1. Preparation before Class.

**2.1.1. Selection of course materials.** In terms of selecting and developing course materials, educators should select and develop corresponding course materials based on the current teaching objectives and students' basic conditions, and the difficulty should not be too high or too low. Moreover, when setting the teaching time, it should not be too short or too long. Within the specified time limit, students can ensure that their attention is fully utilized. If the time is too short, students may have finished before they can enter the learning state. The arrangement of extracurricular homework should be in line with the teaching objectives, with a focus on laying a solid foundation rather than promoting it. Too much or too difficult content can cause students to develop resistance towards English, which cannot effectively improve their English proficiency and can actually dampen their enthusiasm for learning. The selection of course materials is a key link in combining offline and online teaching, which can be considered from several perspectives such as students' requirements, teaching objectives, and learning outcomes.

**2.1.2. Students' autonomous learning.** Using artificial intelligence technology to analyze students' learning behavior: by monitoring the activity record, browsing history, learning time and other data of stu-

dents' online learning platform, it can understand students' learning habits, learning progress and learning effect. In traditional face-to-face teaching, if the teaching time is set at noon, it would cause some students to doze off during this period, affecting the efficiency of classroom teaching. In blended teaching, students can choose their own time to learn. The blended teaching mode refers to a new type of experiential teaching that integrates modern teaching methods and traditional teaching concepts by utilizing multiple experiences, combining multiple contents, and integrating multiple methods. Since the outbreak of the epidemic, the call of the Ministry of Education to "leave school without leaving teaching, suspend classes without stopping" has further accelerated the deep integration of online and offline teaching. Blended teaching not only fully stimulates students' subjective consciousness, but also allows them to perceive the charm of learning through creative activities. Especially among English majors in colleges and universities, the effective application of blended teaching can, to a large extent, enable students to use fragmentation time for English conversation practice and situational learning. This not only effectively improves students' enthusiasm for active learning English, but also cultivates students' intercultural communication ability.

**2.1.3. Preview.** In blended English teaching, preview is the primary link. Due to the constraints of the number of students, class hours and other factors, the traditional classroom teaching cannot be fully discussed, so there are few opportunities for students to practice in the classroom. In contrast to the pre class preview in the network environment, teachers can set learning goals and topics according to the teaching content, so that students can form a group to carry out cooperative learning [13, 14]. At the same time, teachers can also send relevant audio, video, and courseware to students. When students encounter problems during the preview process, students can communicate with their group members and solve the problems as soon as possible. Teachers can divide students into groups based on their interests, professional background, or other factors. It can choose random groups or choose group members according to the students' willingness, and ensure that the number of members in each group is moderate, so that the effect of cooperative learning can be fully utilized.

When encountering controversial issues, students can seek help from teachers. Teachers can use the online platform where students preview to monitor and guide their pre class learning in real-time, preparing and laying the groundwork for classroom explanations. During the process of preview and discussion, students can deeply reflect on the content of the topic, and find their own sense of value through expressing their own opinions and listening to others, thereby improving their subjectivity. In addition, they can also improve their sense of belonging and relieve pressure in group cooperative learning. Finally, each group summarizes the results of the discussion and communicates with teachers and other students in class.

**2.2. Teacher-student Interaction in Class.** In blended teaching, the teaching method of teachers has changed from simple teaching to student-centered, in order to stimulate students' autonomy and initiative [8]. Students can use online platforms to interact and communicate with teachers and classmates, which can truly achieve teacher-student interaction, student-student communication, and joint learning, thereby achieving understanding and application of knowledge and skills.

Teachers can also showcase their excellent teaching achievements online, providing students with learning references. At the same time, in order to enable students to consolidate and expand their knowledge, teachers should also analyze the learning situation and abilities of each student, and set up expansion content for students who have spare time, encouraging them to dare to challenge themselves. For students with poor learning abilities, teachers should encourage them more and guide them in understanding and learning knowledge. AI plays an increasingly important role in English teaching. Therefore, it is necessary to integrate AI technology into blended learning. Speech recognition technology can enhance listening and speaking abilities, or achieve automated evaluation of students' reading and writing skills through natural language understanding.

**2.2.1. Expansion of After-school Cooperation.** Extracurricular expansion refers to extending the learning time in the classroom to extracurricular activities. In the past, in English classes, everyone had to be wary of missing important knowledge, so the atmosphere in the classroom was quite oppressive. In blended English teaching, teachers can use various software to post classroom videos and courseware online, allowing students to consolidate and review after class. At the same time, they can also ensure that there are no omissions through their own self-learning and inquiry [16, 17].

Teachers can also assign some after-school exercises and follow-up discussion topics to students, allowing

them to engage in group discussions and exchanges. Students can express their opinions and exchange learning experiences with classmates and teachers at any time. Teachers can monitor students' learning situation and promptly solve difficulties encountered, which makes up for the time limitations of traditional classroom teaching. Google offers a cloud-based speech recognition API that converts speech to text. Developers can do voice recognition by calling the API provided by Google.

**2.2.2. AI Based Speech Recognition.** AI can analyze students' learning records to gain a better understanding of their learning tendencies and needs, and provide corresponding content and functions to meet their requirements, timely correcting their grammar, pronunciation, vocabulary use, and language application. AI has also received increasing attention in English assisted teaching, and the application of AI in teaching research has gradually matured. The availability of AI in terms of interactivity, flexibility, and more space for choosing answers would be of great interest to language teachers. In AI, intelligent speech recognition technology can achieve automatic evaluation, defect localization, and problem analysis of the speaker's speech level [18, 19].

Speech recognition technology is to convert the vocabulary in human voice into computer readable input, such as keyboard, binary code or string. In the process of speech signal processing, it is often necessary to segment it and use window function to truncate it, so that it has less distortion.

By multiplying a certain number of window function  $W(n)$  by  $\overline{S(n)}$ , the windowed voice signal  $S_w$  can be obtained:

$$S_w = \overline{S(n)} * W(n) \quad (2.1)$$

In speech processing, the window function is also the basic data to be used. There are generally two types: one is the rectangular window, and the other is the Hamming window. The rectangular window is:

$$W(n) = \begin{cases} 1, & \text{if } 0 \leq n \leq N - 1 \\ 0, & n = \text{else} \end{cases} \quad (2.2)$$

Hanning Window  $W'(n)$  is:

$$W'(n) = \begin{cases} 2\pi n, & \text{if } 0 \leq n \leq N - 1 \\ 0, & n = \text{else} \end{cases} \quad (2.3)$$

The larger the value of the window function, the better the effect of the filter and the smoother the signal. On the contrary, if the window function is narrow, the filtering effect cannot be achieved. For extracted speech, its slope should gradually decrease to 0 to avoid truncation effects.

When analyzing speech signals in time domain, it is needed to extract their features. The easiest to get is the short-term average Zero-crossing rate, that is, the signal in each frame, whose frequency passing through the zero point is called Zero-crossing rate. The Zero-crossing rate can truly reflect the spectrum properties:

$$Z_n = \frac{1}{2} \sum_{m=0}^{N-1} |\text{sgn}[x_n(m)] - \text{sgn}[x_n(m-1)]| \quad (2.4)$$

The Zero-crossing rate of voiceless  $x_n(m)$  is generally high, because its energy is concentrated in the high-frequency signal segment; the Zero-crossing rate of voiced  $x_n(m-1)$  is generally low because its energy is concentrated at a lower frequency. What lies between these two is usually noise.

Before training and recognizing speech, it is necessary to normalize the data to avoid saturation during output. The normalization formula is:

$$X_{mid} = \frac{X_{max} + X_{min}}{2} \quad (2.5)$$

$X_{min}$  and  $X_{max}$  represent the minimum and maximum values of a row of data, respectively.

Due to the fast fluctuation speed and large fluctuation of speech signals in the time domain, they are usually transformed into frequency domain detection, where the fluctuation of their spectrum is relatively

Table 3.1: Basic Information

|                 | Category     | Group A | Group B | Total |
|-----------------|--------------|---------|---------|-------|
| Gender          | Male         | 23      | 23      | 46    |
|                 | Female       | 23      | 23      | 46    |
| Age (years old) | 18-20        | 25      | 22      | 47    |
|                 | More than 20 | 21      | 24      | 45    |

gentle. Therefore, it is generally necessary to perform Fourier transform on windowed frames to obtain the spectral coefficients  $c_m$  of all frames:

$$c_m = \sum_{K=1}^N E_K \cos\left(m\left(k - \frac{1}{2}\right)\frac{\pi}{2}\right) \quad (2.6)$$

Intelligent speech recognition technology has a voice library. After the teacher or student reads through the microphone, the software would automatically record the user's voice and compare it with the correct pronunciation in the built-in voice library. After that, it would provide a score and mark the error points in the pronunciation. Intelligent speech recognition technology can provide timely feedback on the accuracy of learners' pronunciation, allowing teachers or students to have a better understanding of their own pronunciation problems, and then carry out targeted correction exercises. In English exams, teachers can use intelligent speech recognition technology to evaluate students' learning situation and timely correct students' incorrect pronunciation based on feedback information provided by the system. In addition, in the classroom teaching process, students can also use intelligent pinyin technology to learn and consolidate vocabulary, sentence structures, etc.

### 3. Evaluation of Blended Teaching Effectiveness Based on AI.

**3.1. Impact of Intelligent Speech Recognition Technology on Hybrid Teaching.** According to the hierarchical English teaching background of the school and the statistics of the final English scores of the last two semesters, the two classes with the smallest difference in the level of students within the class were selected. This article selected 92 English major students from a certain university for experimental analysis, and divided them into two groups: Group A and Group B, with 46 students in each group. Group A used traditional English teaching methods for teaching, while Group B used AI based English blended teaching for a period of 24 weeks, followed by comparative experiments. A survey was also conducted on the teaching effectiveness of 50 English teachers. At the end of the experiment, evaluations were conducted and the experimental data was statistically analyzed. The basic situation of students is shown in Table 3.1.

In Table 3.1, it can be seen that the number of males and females in Group A and Group B was the same. This was because in order to make the experiment comparable, the variables were deliberately controlled to ensure the same gender ratio, making the experiment more rigorous.

The reading function in AI based speech recognition technology can help students master English pronunciation correctly, which effectively solves some non-standard pronunciation problems that students may encounter during the learning process. In teaching, teachers can use intelligent speech recognition technology to avoid the negative impact of their incorrect pronunciation on students' English learning, so that they can learn correct pronunciation and correct their pronunciation in a timely manner. During the teaching process, teachers can also improve students' learning effectiveness by controlling their speaking speed and volume according to their own requirements. AI can provide more materials for English teaching and provide more convenience for teachers to carry out various English teaching activities. The application time of intelligent speech recognition technology in the classroom is shown in Table 3.2.

In Table 3.2, the cumulative time for classroom preview was 12.5 minutes, while the cumulative time for using intelligent speech recognition technology was 8.8 minutes. The usage time ratio of intelligent speech recognition technology was 70.4%, with the highest usage time ratio of intelligent speech recognition technology in pronunciation evaluation, which was 92.6%.

Table 3.2: Application Time of Intelligent Speech Recognition Technology in the Classroom

| Types                       | Cumulative Time (minutes) | Use Time with Intelligent Speech Recognition (minutes) | Intelligent Speech Recognition Usage Time Ratio (%) |
|-----------------------------|---------------------------|--|---|
| Class Preview               | 12.5                      | 8.8  | 70.4  |
| Import                      | 9.8                       | 6.5  | 66.3  |
| Word Teaching               | 21.6                      | 16.4   | 75.9  |
| Sentence Pattern Teaching   | 19.3                      | 13.3   | 68.9  |
| Oral Communication Teaching | 28.2                      | 22.5   | 79.8  |
| Review and Consolidate      | 37.1                      | 27.7   | 74.7  |
| Pronunciation Test          | 14.9                      | 13.8   | 92.6  |

Intelligent speech recognition technology can not only enable teachers to achieve teaching objectives, but also utilize existing or self-made personalized teaching resources to continuously learn English for students. In addition, personalized reading pen cards made by teachers using intelligent speech recognition technology tools can also create a diverse learning environment, thereby stimulating students' learning enthusiasm. At the same time, through the speech evaluation function, students' voices can be tested and corrected.

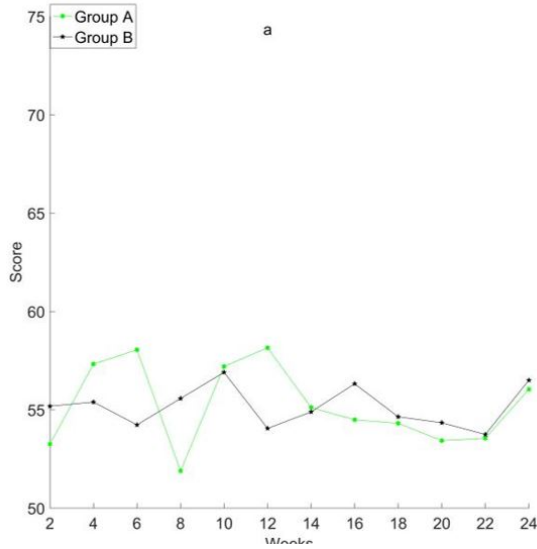
**3.2. AI Based Blended English Teaching Effectiveness.** This article aimed to compare the effectiveness of AI based blended English teaching with traditional teaching, and further explore whether AI can improve English teaching level. AI can provide students with an interactive English learning environment in English teaching and change the current situation of "deaf mute English", which allows for a high degree of freedom in teaching time, students' initiative in learning, personalized teaching, and improving students' English grades.

AI can provide an interactive English teaching environment and change the current situation of "deaf and mute English".

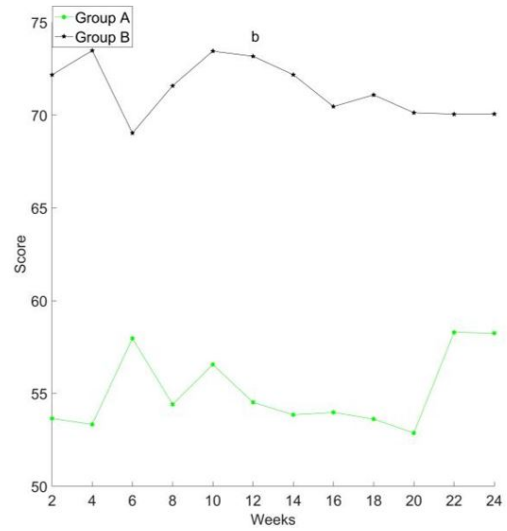
The traditional teaching method in English classrooms is relatively rigid, usually with teachers holding English textbooks to explain theoretical things to students, while students passively listen. This situation is no different from English learning in junior high school and high school before. If the English class is still the monotonous and tedious teaching method it used to be, it cannot stimulate students' enthusiasm for learning. The blended teaching of "online+offline" is the transfer of theoretical knowledge learning to online platforms. Teachers can guide students to self-study before class and organize various practical activities in the classroom, which enables students to proficiently apply English knowledge. In this way, traditional teaching methods can be effectively changed and a brand-new English classroom can be established. The interactive evaluation of teaching methods in Group A and Group B before and after the experiment is shown in Figure 3.1. The score is on a percentage scale.

In Figure 3.1a, two weeks before the experiment, Group A and Group B scored 53.25 and 55.18 points respectively on the interactivity of their teaching methods; 24 weeks before the experiment, Group A and Group B scored 56.04 and 56.50 respectively on the interactivity of their teaching methods. Figure 3.1b shows that two weeks after the experiment, Group A and Group B scored 53.65 and 72.17 respectively on the interactivity of their teaching methods. At this point, compared to the two weeks before the experiment, the score change in Group A was relatively small, while the score change in Group B was significant. After 24 weeks of the experiment, Group A and Group B scored 58.25 and 70.06 respectively on the interactivity of their teaching methods. After 24 weeks of the experiment, both Group A and Group B improved their scores on interactivity. However, Group A's rating for interactivity improved very little, while Group B's rating for interactivity increased significantly, indicating that Group B's teaching methods have strong interactivity.

The English classroom requires an interactive teaching environment, and universities can use various methods such as English corners, foreign teachers, exchange students, and internships with foreign companies to create an interactive English teaching atmosphere. However, in traditional classrooms, students find it difficult to understand English, let alone communicate fluently in English, which leads to the problem of "deaf mute



(a) Interactive evaluation of teaching methods in Group A and Group B before the experiment



(b) Interactive evaluation of teaching methods in Group A and Group B after the experiment

Fig. 3.1: Interactive evaluation of teaching methods by Group A and Group B before and after the experiment

Table 3.3: Degree of Freedom in Traditional Offline Teaching

| Degree of Freedom | Teachers | Percentage |
|-------------------|----------|------------|
| Very Free         | 4        | 8%         |
| Relatively Free   | 2        | 4%         |
| In General        | 5        | 10%        |
| Unfree            | 12       | 24%        |
| Very Unfree       | 27       | 54%        |

English” among students. However, AI can provide technical support for the development of English teaching environments. AI can be used to comprehensively process various media information such as text, images, sound, etc., and logically associate and integrate them to form a complete set of representations, thus providing multiple interactive modes for English teaching.

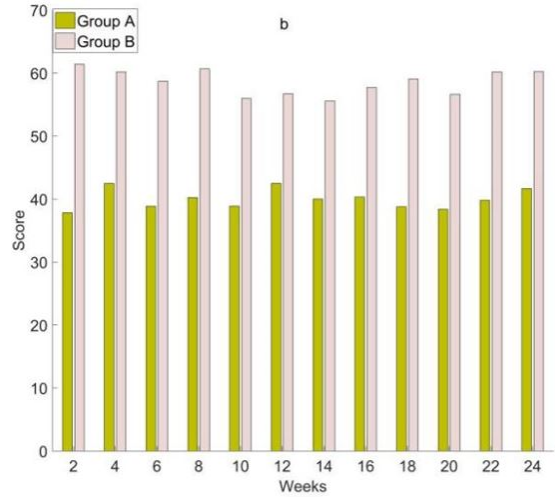
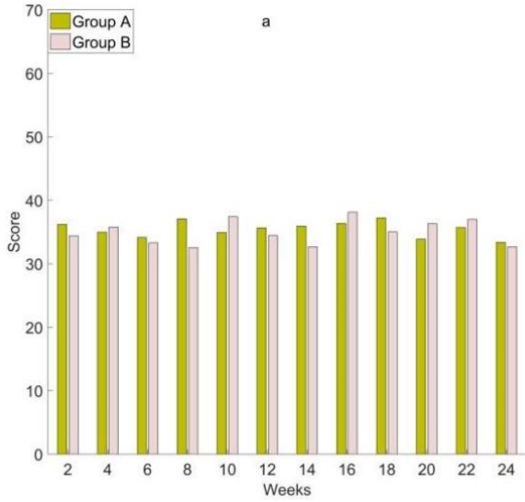
**3.2.1. High degree of freedom in teaching time.** Adopting a blended teaching approach can effectively expand the space of English teaching and improve the freedom of teaching time. Traditional English classroom teaching is limited by both time and space, which brings great pressure to teachers’ teaching. In order to complete teaching tasks, English teachers often adopt a “one talk” teaching model, while students only mechanically memorize some words, grammar, and problem-solving skills, which makes English classrooms dull and unable to achieve individualized teaching. 50 teachers experienced a session of traditional offline instruction as well as a session of blended instruction, and then analyzed the freedom they perceived between the two types of instruction. The degree of freedom that 50 teachers believe in traditional offline teaching is shown in Table 3.3.

In Table 3.3, only 4 teachers believed that traditional offline teaching is very free, accounting for only 8% of the total; only 2 teachers believed that traditional offline teaching is relatively free, accounting for only 4% of the total; 27 teachers believed that traditional offline teaching is very unfriendly, accounting for 54% of the



Table 3.4: Degree of Freedom in Blended Teaching

| Degree of Freedom | Teachers | Percentage |
|-------------------|----------|------------|
| Very Free         | 42       | 84%        |
| Relatively Free   | 5        | 10%        |
| In General        | 3        | 6%         |
| Unfree            | 0        | 0%         |
| Very Unfree       | 0        | 0%         |



(a) Proactive rating of students in groups A and B before the experiment

(b) Proactive rating of students in Group A and Group B after the experiment

Fig. 3.2: Proactivity scores of students in Group A and Group B before and after the experiment

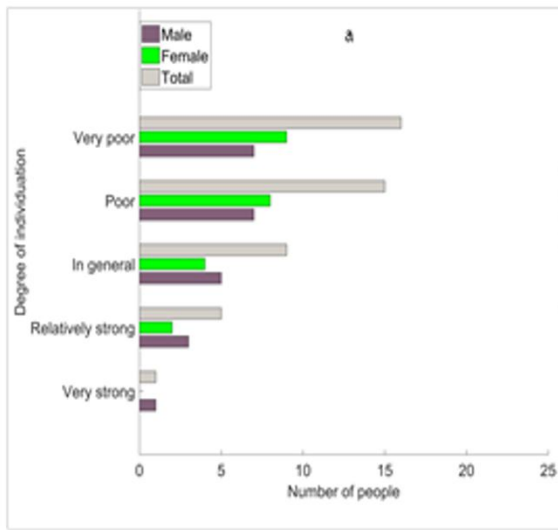
total. The degree of freedom perceived by 50 teachers in blended learning is shown in Table 3.4.

In Table 3.4, there were 42 teachers who indicated that blended learning is very free, accounting for a high percentage of 84%; there were 5 teachers who indicated that blended learning is relatively free, accounting for a percentage of 10%; the proportion of teachers who indicated that blended learning is very free and relatively free added up to 94%. It can be seen that blended learning has a very high degree of freedom.

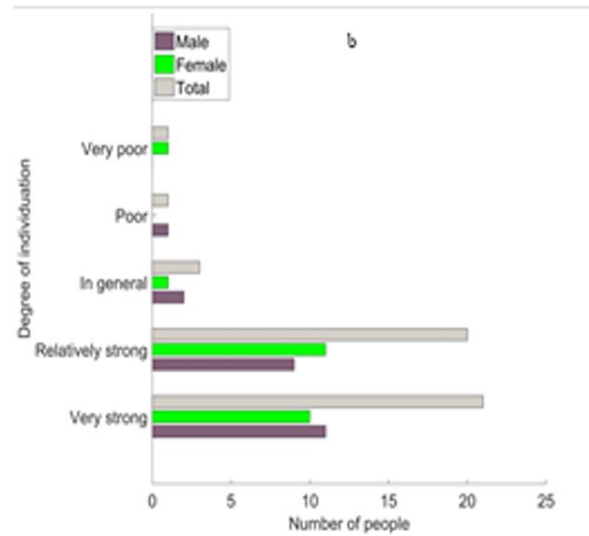
The most prominent feature of blended English teaching under AI is the high degree of freedom in teaching time. With the support of AI, teachers no longer need to teach at fixed times and locations, but can assign learning tasks at any time and location before and after class. This allows students to learn fragments according to their actual situation, enhancing teaching flexibility.

**3.2.2. Strengthening students’ initiative.** Mixed teaching focuses on the cultivation of students’ active learning ability, thus forming a good atmosphere for students’ active learning. Blended teaching can effectively solve the lack of students’ initiative cultivation in traditional teaching models, and students would not actively raise their own problems during the learning process. The initiative scores of students in Group A and Group B before and after the experiment are shown in Figure 3.2.

In Figure 3.2a, two weeks before the experiment, students in Group A and Group B rated their learning initiative as 36.21 and 34.42, respectively; 24 weeks before the experiment, students in Group A and Group B rated their learning initiative as 33.39 and 32.69, respectively. Before the experiment, students in both groups had low learning initiative; during the 24 weeks before the experiment, students in Group B rated their learning



(a) Comparison of personalization levels in Group A after the experiment



(b) Comparison of personalization levels in Group B after the experiment

Fig. 3.3: Comparison of personalization levels between Group A and Group B after the experiment

initiative even lower than those in Group A.

Figure 3.2b shows that two weeks after the experiment, students in Group A and Group B rated their learning initiative as 37.84 and 61.40, respectively; after 24 weeks of the experiment, the scores of students in Group A and Group B on their learning initiative were 41.69 and 60.23, respectively. After the experiment, the learning initiative of Group B students made significant progress, while the change in learning initiative of Group A students was not significant.

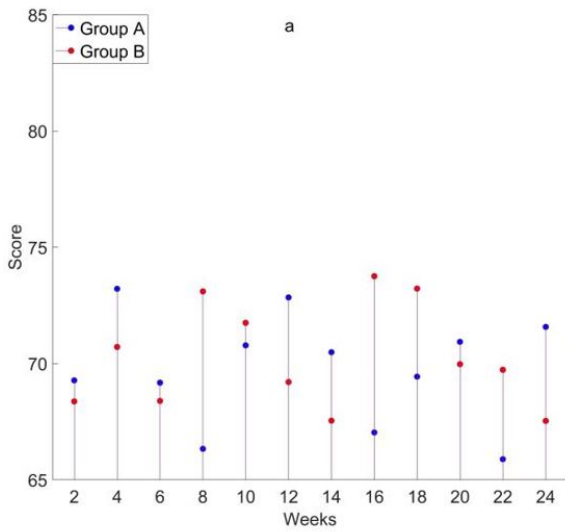
Blended teaching combines technological means with teaching methods, and follows the rules of students' learning and teachers' teaching. It does not emphasize online teaching, nor does it ignore teachers' words and deeds in offline classroom teaching. Teachers play a guiding role in teaching, and they can guide students from mastering language knowledge to acquiring language skills by designing various forms of teaching activities and tasks.

**3.3. Providing personalized teaching.** In this information age dominated by technology, computers can provide personalized services for different users. Nowadays, teachers are able to use smart computers to provide personalized education for different students, which is the characteristic of AI in English blended teaching.

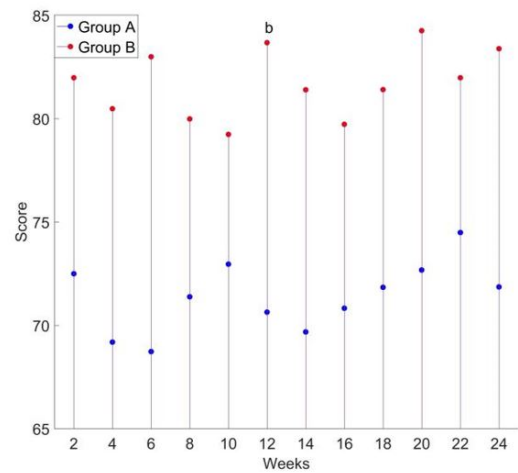
The biggest advantage of AI technology in English teaching lies not only in its ability to simulate real English environments, but also in its ability to provide students with an efficient and personalized teaching platform. For example, AI can help students better train English vocabulary, speaking, and writing, while also helping students correct errors in pronunciation, grammar, and grammar. Expanding extracurricular knowledge that meets user learning needs and interests beyond grammar and vocabulary, AI can provide personalized teaching methods that can optimize teaching effectiveness. The comparison of personalization levels between Group A and Group B after the experiment is shown in Figure 3.3.

In Figure 3.3a, it was observed that only 1 boy and 0 girl in Group A felt that the teaching personalization in this group was very strong, but 7 boys and 9 girls felt that the teaching personalization in this group was very poor, with a total of 16 students feeling that the teaching personalization in this group was very poor.

Figure 3.3b shows that there were 11 boys and 10 girls in Group B who felt that the teaching personalization



(a) Comparison of average English scores between Group A and Group B students before the experiment



(b) Comparison of average English scores between Group A and Group B students after the experiment

Fig. 3.4: Comparison of average English scores between Group A and Group B students before and after the experiment

of this group was very strong, while there were 0 boys and 1 girl who felt that the teaching personalization of this group was very poor. It can be seen that most students believed that the teaching personalization of Group B was very strong.

Teachers can use AI to bring vitality to English classrooms and provide students with more extracurricular English learning resources. In addition, online English teaching resources are rich and diverse. It is very important to ensure the efficient use of English resources by both teachers and students in English teaching. AI's intelligent retrieval technology can provide English teachers with more information, allowing them to choose suitable English resources based on their different levels, personalities, and learning stages, thereby formulating and adjusting personalized learning strategies.

**3.4. Comparison of Grades.** In traditional English classrooms, the teaching methods of teachers are all one-on-one. For students with good grades, a single class does not allow them to learn more, while students with poor grades would be unable to keep up due to the teacher's teaching speed. Over time, they would lose interest in learning. However, under the English blended teaching with AI, there have been significant changes in English learning methods. Teachers can design a set of targeted, hierarchical, and targeted courses for each student based on their learning abilities, and allow students to learn according to their own abilities before and after class. The comparison of average English scores between Group A and Group B students before and after the experiment is shown in Figure 3.4.

Figure 3.4a shows that the average English scores of students in Group A and Group B in the first two weeks of the experiment were 69.27 and 68.37, respectively; the average English scores of Group A and Group B students in the 24 weeks prior to the experiment were 71.57 and 67.53, respectively.

Figure 3.4b shows that the average English scores of students in Group A and Group B after 2 weeks of the experiment were 72.50 and 81.98, respectively; after 24 weeks of the experiment, the average English scores of students in Group A and Group B were 71.86 and 83.39, respectively.

One student said, "Blended learning allows me to learn at my own pace. I can study the course content at

home or anywhere through the online learning platform, so I can plan my study according to my own pace and time, which is more flexible and convenient.” The data showed that the average English score of Group A students after the experiment slightly improved compared to the average English score of Group A students before the experiment. However, the average English score of Group B students after the experiment significantly improved compared to the average English score of Group B students before the experiment, indicating that the teaching method of Group B is more conducive to improving students’ English grades.

AI based blended English teaching is essentially an innovation of the traditional English teaching model. It emphasizes the combination of “teaching” and “learning” and complements each other, thus overcoming the shortcomings of “cramming” teaching. Through collaborative previewing before class, teacher-student interaction in class, and collaborative expansion after class, innovation in English courses has been achieved. This makes online and offline classroom teaching complement each other, effectively improving teaching quality.

#### **4. Strategies for Constructing a Blended English Teaching Path.**

**4.1. Hybrid Construction of Online Learning Platform and Traditional Classroom.** Based on the current situation of English teaching, there is generally an online learning platform, but in most cases, teachers do not personally participate and instead allow students to log in to the online learning platform on their own computers or laptops after class. Due to the lack of teacher participation, some students do not engage in serious learning on online learning platforms, making it difficult to achieve good learning outcomes. Therefore, English teachers must pay attention to this and combine online learning platforms with traditional theoretical courses to establish a teaching model that combines online and offline. Specifically, in theoretical classroom teaching, by logging into the online learning platform through the teaching computer, learning materials are introduced into the classroom and collective learning is carried out in the classroom. In addition, theoretical teaching can also be transferred to a computer room, allowing students to log in to an online learning platform. Teachers can explain theoretical knowledge while allowing students to practice through the online learning platform, achieving an effective combination of teaching and learning. This can not only improve students’ theoretical knowledge accumulation but also enhance their practical level.

While fully utilizing existing online learning platforms, teachers should also attach importance to the development of new media and combine it with English classroom teaching to create a new and diverse teaching method. Teachers can organize and summarize the content to be taught, and design it into a learning micro lesson. After that, it would be released through WeChat official account. This allows students to receive WeChat official account pushed learning lessons on their mobile phones, and use their free time before classes to learn by themselves. During class, practical activities can be set up to allow students to participate in free discussion activities for a certain period of time based on self-study before class, while teachers provide guidance and observation on the side. Teachers can also open a second classroom online and allow students to interact, learn, and exchange English with teachers on devices such as mobile phones and computers.

**4.2. Optimizing Teaching Content.** Before English teaching, teachers need to publish the teaching plan of the entire course and the teaching arrangements for each stage on the online teaching platform, so that students can make choices and prepare in advance. During teaching, the content of each class would be posted online for students to preview and review. When publishing lecture content, the application and extension of related knowledge can also be published together to stimulate students’ interest in learning and pay attention to the knowledge points. This makes communication and interaction in classroom teaching more convenient, and can also promote the comprehensive development of students. In order to explain the key and difficult points of English knowledge, teachers can first use some pre prepared micro lessons or MOOCs in the classroom, including videos, audio, animations, text materials, etc. These can provide visual and auditory stimuli to students, enabling them to better understand and remember this information. The “teacher student” interaction in online teaching can be utilized to emphasize students’ initiative. In the classroom discussion segment, attention should be paid to cultivating students’ awareness of multi angle and comprehensive thinking, and teachers should provide correct guidance for students’ interaction. So, in the classroom teaching process, teachers should try to encourage students to speak up and respect their opinions. Positive emotions between teachers and students can stimulate students’ interest in learning.

By publishing the content of after-school exercises on online teaching platforms, students can consolidate

the learning content and deepen their understanding of knowledge through online after-school exercises and reviews after classroom teaching, thereby effectively improving the quality of teaching. The content of the post-class learning test can be a re-presentation of classroom learning content, or resources such as test questions and papers used to evaluate the effectiveness of teaching and learning, as well as some references and web site materials used to extend the learning content. In addition to the function of teaching content, the online teaching platform also provides an after-school exam module published by teachers to conduct online testing of the teaching content in the classroom or in front of it. The platform can automatically provide test results for objective questions and provide real-time feedback to teachers and students, thereby evaluating their learning effectiveness. Students can also use the teaching platform to evaluate the teaching effectiveness of teachers. Teachers can adjust the teaching plan for this lesson or the next step in a timely manner based on students' mastery and learning needs, striving to achieve the best teaching effect.

**5. Conclusions.** With the rapid development of AI technology, its application in learning and daily life is increasing. Applying it to blended English teaching would have a direct impact on the development of AI technology in modern information education. AI based blended English teaching can fully leverage the enormous resource advantages of the internet. This enables students to acquire more knowledge that is suitable for themselves and provides a new approach and method for English teaching. This article introduced AI based blended online and offline teaching. It was found that AI based speech recognition technology has been used for a long time in English classrooms and can improve students' English learning performance to a certain extent. In order to demonstrate that blended learning based on AI can promote the development of English teaching in the experiment, a comparative analysis was conducted between traditional English teaching and blended learning. After experiments, it was found that blended teaching based on AI can change the current situation of "deaf mute English" and provide teachers with a high degree of freedom in their teaching time, thereby improving students' learning initiative and providing personalized teaching. Moreover, it has also improved students' English grades. In summary, blended learning based on AI has its unique advantages, which can assist students in English learning. Schools should combine online and offline courses organically based on the actual situation of students, in order to maximize their advantages and improve their English learning abilities.

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