IMPROVING ENGLISH LISTENING AND SPEAKING ABILITY BASED ON ARTIFICIAL INTELLIGENCE WIRELESS NETWORK

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Abstract

Artificial intelligence wireless network technology represents the frontier of science and technology, and artificial intelligence products are constantly derived. A large number of intelligent systems have been applied in education and teaching, providing more students with a new learning mode in the information age. The emergence of the intelligent learning system breaks the traditional learning method in the classroom, allowing students to obtain learning resources anytime, anywhere, free from fixed time and fixed space. The intelligent phonetic learning system is a new learning tool aimed at cultivating the listening and speaking English abilities of primary and secondary school students. Listening and speaking teaching have always been weak links in English teaching in junior and senior high schools. How let students develop English listening and speaking skills, acquire rich phonetic resources, and create a more realistic language environment are the most troublesome problems for English teachers. At present, the application of an intelligent voice system in the nine-year compulsory education stage is almost a blank stage. This study aims to understand the present situation of English listening and speaking training for junior high school students, analyze the problems in the teaching of English, such as listening and speaking, and put forward new strategies for the combination with the convenience of the information age. With the advantage of the intelligent voice system, this paper proposes a strategy for cultivating the listening and speaking of English ability of junior high school students based on the intelligent voice system and uses the literature research method, questionnaire survey method, and quasi-experimental research method to explore the improvement strategy of listening and speaking of English ability based on artificial intelligence wireless network. Validity of the study. The research results show that the experimental hypothesis of this study is correct in many aspects, and the listening and speaking English ability
training strategy of junior high school students based on an intelligent voice system can improve the students' English listening and speaking ability.

**Keywords:** Artificial Intelligence, informatization, voice system, English listening and speaking.

1. **Introduction**

   According to the statistics of American foreign language pedagogies 'Wiliam. Rivers (1982)', listening and speaking occupy the highest percentage of actual time in human language communication activities, among which "listening" accounts for 45% and "speaking" accounts for 30%, the two together have accounted for 75%, "read" and "write" accounted for 16% and 9%, respectively, accounting for 25%. This shows the importance of the ability to "listen" and "speak" in human activities. With the reform of the high school entrance examination, more and more attention has been paid to the examination of students' listening and speaking abilities. How to carry out listening and speaking teaching activities, guide students to conduct listening and speaking training scientifically and efficiently, and improve students' listening and speaking ability is an urgent problem to be solved in English teaching. Language learning is nothing more than the process of input and output. Only with high-quality input can there be high-quality output. Listening is input, speaking is output, that is to say, only high-quality hearing input can better speak. However, as a foreign language, in the Chinese language environment, learners often lack high-quality listening input. Under the development of information technology, artificial intelligence technology is more and more used in English teaching. Using information technology to improve the quality of listening input and improve students' listening and speaking ability is a topic worthy of discussion. In the following, we will conduct research on the improvement strategy of English listening and speaking ability based on artificial intelligence wireless network from four aspects: research background, literature review, research content and method, and research conclusion.

2. **Research background**

   The concept of artificial intelligence started in the 1950s. After going through the stage of computational intelligence and perceptual intelligence, it quickly entered the stage of cognitive intelligence 'Xu Guibao. (2019)'. The functions of the first two stages are relatively single, and the impact on teaching is also very limited, and the arrival of cognitive intelligence will inevitably carry out intelligent transformation and remodelling of the entire teaching process, thus triggering more opportunities and opportunities for the development of cognitive intelligence. The arrival of artificial intelligence can effectively help teachers establish teaching goals and the selection and utilization of teaching content.

   McLuhan once said, "The media is an extension of the human body. Humans shape the media, and the media also shapes human beings." ‘Yu Shengquan. (2021)’ Artificial intelligence is the embodiment of human intelligence, and human beings create machine intelligence and improve human intelligence at the same time. The greatest achievement of information technology is artificial intelligence. The intelligent teaching system has played a crucial role in teaching. The first-line teaching practice has proved that the application of this technology can bring earth-shaking changes to teaching. The reform of English curriculum aims to combine information technology with English curriculum to promote the effect of English teaching and bring opportunities for integrating artificial intelligence and subject. It is a general trend to introduce
artificial intelligence into English teaching. Artificial intelligence is actually the science of using computers to simulate human intelligence. With the rapid development of the information age, the development of computer technology affects the process of social development. People are most concerned about the application of artificial intelligence technology in reality. Artificial intelligence has changed the way of human production and life and has an irreplaceable role in the field of education and teaching. Language, as the primary tool of human communication, is of great importance. In artificial intelligence technology, language processing, machine translation, speech recognition and so on are all inextricably related to human language learning. Therefore, it is more natural to apply artificial intelligence technology to human language learning and development. English, as the second language in China, is a difficult problem in talent training due to the lack of English communication ability in all stages of learning. In the basic education stage, the unsatisfactory English teaching effect has become an academic topic discussed by experts and scholars and also a difficult problem in front of teachers, parents and students. To sum up, the practical application of artificial intelligence technology should be added to the teaching of English subjects in middle schools, and the reform force brought by artificial intelligence technology is bound to affect the English teaching practice in middle schools.

This research finds out the key factors that affect the teaching of English listening and speaking ability by combing the literature and analyzing the current situation. With the help of the intelligent voice wireless network system, which is a product in the era of artificial intelligence, it breaks through the key factors affecting the teaching of English listening and speaking. The systematic junior high school English listening and speaking teaching mode provide students with a richer language learning environment. Intelligent voice feedback and scientific evaluation mechanism also provide a basis for teachers to provide scientific and reasonable guidance to students, and at the same time increase students' enthusiasm for English learning.

3. Literature review

3.1 Intelligent Voice Learning System

An intelligent voice system is also called an intelligent human-computer interaction system, which mainly includes voice interaction, touch screen interaction, and visual interaction. Nowadays, people are most familiar with the most widely used method of voice interaction. The input of language is used as the main information carrier. During the interaction with people, activities such as being able to speak and listen, answering questions, and learning to think are completed, imitating the natural nature of people. interactive process ‘Cui Yue and Song Qijun.(2019)’. There are many common voice interaction systems, such as the "Siri" voice system developed by Apple, the "Xiao Ai" intelligent interactive system developed by Xiaomi, and the "Tmall Genie" AI intelligent system developed by Alibaba Artificial Intelligence Laboratory. And so on, all rely on the rapid reflection of voice processing, voice recognition, and audio processing technology to make people's production and life more convenient. It can be seen that the intelligent voice system gets rid of the traditional form of human-computer interaction, and the dialogue-type interaction makes the whole process simple and effective. It is also more in line with the communication habits between people.

At present, my country's intelligent speech technology includes four technologies: speech recognition, semantic understanding, natural language generation, and speech synthesis
'LiuJian. (2019) ' The process of speech recognition and semantic understanding is shown in Figures 3-1. The technologies in the entire semantic understanding process mainly include high recognition accuracy, cold wake-up, and far-field noise reduction. Semantic understanding mainly realizes adding context to multiple rounds of dialogue. Analysis function, natural language generation technology mainly realizes translation function. In my country, the machine translation capabilities of some of the equipment of many first-line smart terminal manufacturers are already at the international leading level, especially in the aspect of speech synthesis, which has realized the function of Chinese and English synthesis, which has surpassed the level of ordinary people. This type of technology has been It is widely used in education, production, home furnishing, transportation, and other fields.

**Figure 3-1** The process of speech recognition and semantic understanding

### 3.2 Domestic English listening and speaking ability requirements

"English Curriculum Standards for Compulsory Education (2011 Edition)" (hereinafter referred to as "Curriculum Standards") divides junior high school compulsory education into three levels. Students in grades 7, 8, and 9 complete the goals of grades 3, 4, and 5 respectively. Among them, students in grade 7 The specific requirements of the three-level target task should
be completed ‘Beijing Normal University Press. (2017)’. The course grading objectives are shown in Table 3-1:

**Table 3-1. Course Grading Catalog**

<table>
<thead>
<tr>
<th>Level</th>
<th>Target description</th>
</tr>
</thead>
</table>
| Level 3 | 1. Students can understand stories about related topics and exchange information with teachers and classmates on this topic (such as school and family life).  
2. Can read simple written materials and describe them in simple words.  
3. Can describe an activity or participate in an action based on some brief prompts or information. |

In the "Curriculum Standards", level requirements are also put forward for language skills, among which the seventh-grade students should complete the specific requirements of the third-level target tasks. In the language skill standard, it is necessary to use the "what can students do" at a certain level as the measurement standard, which will help to mobilize students' enthusiasm for learning, improve students' language ability, and help teachers to evaluate students in a scientific and targeted manner. learning outcomes. The language grading standards are shown in Table 3-2:

**Table 3-2. Language Skills Grading Standards**

<table>
<thead>
<tr>
<th>Level</th>
<th>Skill</th>
<th>Target description</th>
</tr>
</thead>
</table>
| Level 3 | Listening | 1. Able to distinguish sentences with different meanings according to pronunciation intonation.  
2. Able to identify changes in meaning in sentences from different intonations.  
3. Can understand the relationship between the preceding and following sentences.  
4. Be able to understand and respond to relevant instructions in activities.  
5. Can understand the primary meaning of the topic.  
6. Able to briefly describe the theme of the topic according to the prompts. |
| Level 3 | Speaking | 1. Able to complete simple communication with classmates in class.  
2. Can imitate the content of familiar topics to communicate with others.  
3. Can play different roles to perform.  
4. Able to describe things with the help of different digital resources and materials.  
5. Able to brief self-introduction and personal experience report.  
6. Can tell a complete story in short answers.  
7. Can recite some English poems and sing some English songs.  
8. Be able to achieve the basic standard of pronunciation and intonation in the above activities. |

3.3 Current status of foreign research
In the early 1990s, there was a heated debate in the U.S. education community, with some arguing that online learning would replace in-person learning, while others did not. ‘Korashen (1985)’ proposed that, as a teacher's assistant and an excellent teaching tool, computers provide teachers with many ways to improve the quality and quantity of language input, and there have been many cases of online teaching practice in the international education community. In the Handbook of Blended Learning, ‘Bonk and Graham (2006)’ pointed out that blended learning is a combination of offline and online teaching ‘Bonk,C.J&J.Cross.(2020)’.

‘Hofiman (2001)’ mentioned in his B-Learning Case Study that the idea behind B-Learning is that an instructional designer divides the learning process into several parts, and then selects the most suitable medium for each part, In this way, part of the content is best presented to the learner ‘Hofman.J.(2021)’.

In the existing foreign practice, the main blended learning modes are divided into the following six types, as shown in Table 3-3:

### Table 3-3 . Types of foreign blended learning models

<table>
<thead>
<tr>
<th>Name</th>
<th>Explanation</th>
<th>Similar Methods</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station Rotation Blended Learning</td>
<td>Similar to taking a train, the train must pass through each platform according to the time point (including teacher lectures, etc.)</td>
<td>Lab Rotation Blended Learning</td>
<td>Have your own time schedule</td>
</tr>
<tr>
<td>Lab Rotation Blended Learning</td>
<td>Like the station rotation blended learning, in the computer lab, arrange flexible time for learning</td>
<td>Station Rotation Blended Learning</td>
<td>Using computer labs in new ways</td>
</tr>
<tr>
<td>distance blended learning fully virtual blended learning)</td>
<td>With online courses, students do not face teachers every day, learning in a completely virtual environment</td>
<td>self-directed blended learning</td>
<td>Students fully implement distance learning and independent study of the course</td>
</tr>
<tr>
<td>Flexible blended learning</td>
<td>The main way students learn the course when studying online, accompanied by offline activities</td>
<td>Distance blended learning, blended learning inside and outside</td>
<td>Formal and informal learning with versatility</td>
</tr>
<tr>
<td>flipped classroom</td>
<td>Students studying content at home, discussing with teacher and classmates at school, role reversal</td>
<td>distance blended learning</td>
<td>Retain traditional teaching methods with new ways to learn at home or at school</td>
</tr>
</tbody>
</table>
3.4 Domestic research status

In our country, schools at different stages are trying time-blended learning methods. Professor He Kekang first formally proposed blended learning at the International Conference on Computer Education in 2005. He defines learning methods in his article "From Learning Integration to New Developments in Educational Technology Theory". He believes that this is a new method that combines the advantages of traditional learning methods and e-learning methods ‘He Kekang,(2020)’. Professor ‘Li Jiahou of Shanghai Normal University (2002)’ believes that this new learning model is to combine all teaching elements to achieve the ultimate learning goal, and emphasizes that "blended learning" requires teachers and students to be proficient in teaching activities ‘Li Jiahou, (2020)’. ‘Huang Ronghuai (2006)’ introduced three teaching forms and four teaching links of blended learning in the book "Integrated Learning of Theory and Practice". Instructional design provides a large number of reference cases for teachers ‘Huang Ronghuai, Zhou YueliangWang Ying. (2020)’. ‘He Aiwen (2010)’ introduced the characteristics of the network system and the feasibility of the application of the English learning platform in the upper primary grades in his paper "Research on the Application of English Websites in the Upper Primary Schools". He particularly discussed the application of this English learning system in English listening, speaking, reading, and writing He Aiwen.(2021).

3.5 Overview of research status

It is relatively late to expand artificial intelligence technology into the field of education and teaching in China, and there is still a certain gap in international research. In domestic research, it is rare to apply an intelligent teaching environment and an intelligent system to teach. In pace with the rapid development of science and technology, more and more technologies are applied to teaching. On the one hand, it provides strong teaching support for teachers. On the other hand, through the use of different technologies, students formulate their personalized learning plans, which greatly improves their learning efficiency of learners. The intervention of artificial intelligence technology will enable teachers to further improve teaching efficiency. Real-time monitoring of students' learning in teaching, scientific grasp of learning effects, push personalized learning resources for students, and provision of personalized diagnosis have become artificial intelligence boosting education. An important direction of teaching reform.

4. Research content and methods

4.1 Research content

This study firstly combs the literature to find out the reasons that affect the improvement of listening and speaking of English ability and analyzes the influencing factors. Secondly, the teaching mode of English listening and speaking is constructed with the help of the intelligent phonetic learning system. Finally, through experiments, revisions, and improvements, a teaching strategy based on the intelligent phonetic system to improve the listening and speaking of English...
ability of junior high school students is proposed. The specific research ideas are shown in Figures 4-1:

![Figure 4-1 Research idea diagram](image)

**4.2 Research methods**

**4.2.1 Literature research method**

The literature research method mainly consists of five steps: establishing the research purpose, determining the research question, collecting the literature, arranging the literature, analyzing the literature, and writing a literature review. Through literature review, this study is familiar with the concepts related to listening and speaking of English ability and combs domestic and foreign researches on the cultivation of listening and speaking of English ability.

**4.2.2 Questionnaire survey method**

The questionnaire method is "a research method in which researchers use a unified and strictly designed questionnaire to collect the psychological and behavioral data of the research object." This study is based on the principle of sample selection and the research object. Questionnaires related to the listening and speaking ability of junior high school students, teacher questionnaires, and parent questionnaires were distributed after class. Detailed question survey data is collected and analyzed to underpin the framework of the theory.

a. Data collection and processing methods

The feedback status of junior high school students' listening and speaking of English ability were collected through questionnaires. Paired samples t-test was performed on the collected data to evaluate the trend of change.

b. Assurance of the reliability and validity of the study

In the research preparation stage, a questionnaire was first distributed to investigate the students' informatization learning ability in the early stage, and the data were subjected to factor analysis. To further ensure the overall reliability of the questionnaire, the Cronbach reliability coefficient analysis was carried out on all items in the questionnaire to ensure stability of the questionnaire. Sturdiness and reliability. The validity of the questionnaire was analyzed by confirmatory factor analysis:

\[ 0 \leq KMO \leq 1 \quad (1) \]

where KMO represents the simple correlation coefficient between the comparison variables. As the KMO value increases (closer to 1), it means that there are more common factors among different variables, and it is better for factor analysis. When the KMO value is small enough, even less than 0.5, it is less suitable to do the factor analysis.

\[ 0.01 \leq SIG \leq 0.05 \quad (2) \]

If the SIG value is in the interval of formula 2, the difference is significant, and if it is lower than 0.01, the difference is extremely significant. Support the follow-up model construction research
in the form of data, analyze several rounds of data through SPSS, analyze the significant differences before and after, evaluate the changes in the quality of the works, and form scientific formative feedback (the reliability and validity of the collected results of this questionnaire are both in a reasonable range, due to space reasons, no detailed description is given here). The results of the questionnaire survey are shown in **table 4-2**:  

<table>
<thead>
<tr>
<th>Question</th>
<th>Very fit</th>
<th>Fit</th>
<th>General</th>
<th>Incompatible</th>
<th>Very Inconsistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1. I like to talk to people in English</td>
<td>19.44%</td>
<td>23.66%</td>
<td>35.87%</td>
<td>9.02%</td>
<td>12.01%</td>
</tr>
<tr>
<td>Q2. I think training, listening and speaking in English can make me feel happy</td>
<td>33.25%</td>
<td>21.55%</td>
<td>28.64%</td>
<td>11.85%</td>
<td>4.71%</td>
</tr>
<tr>
<td>Q3. I can imagine a real environment when I finish an English conversation with my classmates</td>
<td>16.64%</td>
<td>39.54%</td>
<td>21.05%</td>
<td>12.31%</td>
<td>10.46%</td>
</tr>
<tr>
<td>Q4. I will use the book knowledge learned in school to build my own talk scene</td>
<td>23.84%</td>
<td>30.02%</td>
<td>20.54%</td>
<td>11.03%</td>
<td>14.54%</td>
</tr>
<tr>
<td>Q5. I think &quot;listening&quot; allows me to learn more about interesting people and people abroad thing</td>
<td>26.88%</td>
<td>26.32%</td>
<td>24.05%</td>
<td>5.13%</td>
<td>17.62%</td>
</tr>
<tr>
<td>Q6. I don't get distracted when answering other people's questions</td>
<td>21.66%</td>
<td>31.54%</td>
<td>23.33%</td>
<td>16.12%</td>
<td>7.35%</td>
</tr>
<tr>
<td>Q7. I can say what I like or dislike about English dialogue characters</td>
<td>24.5%</td>
<td>27.33%</td>
<td>28.11%</td>
<td>12.71%</td>
<td>7.35%</td>
</tr>
<tr>
<td>Q8. I will tell my parents good English sentences</td>
<td>27.07%</td>
<td>24.13%</td>
<td>28.33%</td>
<td>9.86%</td>
<td>10.61%</td>
</tr>
<tr>
<td>Q9. I can complete the listening and speaking tasks assigned by the teacher on time</td>
<td>17%</td>
<td>28.66%</td>
<td>32.55%</td>
<td>5.93%</td>
<td>15.86%</td>
</tr>
<tr>
<td>Q10. I like to join an English corner or an English interest group outside of class</td>
<td>18.66%</td>
<td>22.25%</td>
<td>37.66%</td>
<td>4.31%</td>
<td>17.12%</td>
</tr>
<tr>
<td>Q11. I take a little time every day to complete my listening training</td>
<td>20.55%</td>
<td>29.12%</td>
<td>31.55%</td>
<td>8.66%</td>
<td>10.12%</td>
</tr>
</tbody>
</table>
According to table 4-2, some students are still willing to communicate with others in English, and most of the students think that they can get a great sense of happiness and satisfaction when communicating with others in English, and they can be immersed in the situation during the conversation. to complete the conversation and be able to apply what they have learned. Most students think that while practicing listening, they can learn more interesting people and things about foreign countries, and at the same time, they can show their likes and dislikes for characters. When talking with others, most of the students are more attentive, can complete the conversation without external interference, and are willing to tell their parents what they think are good English sentences. However, the author also learned from the parents of the students that only a small number of students can speak English in front of their parents, and most of the students are still afraid of letting their parents hear their pronunciation, thinking that their pronunciation is ugly, non-standard, and afraid of making mistakes. Some parents also reported that their children did not understand because the parents did not speak English. Most of the students can also complete the listening and speaking homework assigned by the teacher while completing other homework, and also expressed their willingness to participate in the English corner and English interest group organized by the school or by individual teachers and students. Most of the students try to complete some listening training with the help of some software or voice platform every day to improve their listening level. Most of the students also hope that they can make some foreign friends improve their English listening and speaking level.

4.2.3. Quasi-experimental research method

In this study, two classes with similar levels were selected, one for the experimental class and the other for the control class. The teaching was designed in the experimental class, and the English intelligent learning system based on artificial intelligence wireless network was used to teach the student's listening and speaking abilities. The control class remained the same. According to the teaching method of the original teaching class, through multiple interviews, observation, and comparison of the usual test scores, we can understand the teaching situation and student learning situation of the two classes, and analyze whether there is a gap in the listening and speaking of English ability of the students in the two classes. After that, whether the teaching effect of the teachers in the experimental class and the learning effect of the students are better than those of the ordinary class, and whether the students' listening and speaking of English ability in the experimental class have been improved. Figure 4-2 shows the independent sample T-test results of the listening and speaking test scores of the experimental class and the control class.
Figure 4-2. Independent sample T-test for listening and speaking test scores in experimental class and

5. Conclusions

Through the above three research methods, the preliminary conclusion is drawn that the listening and speaking of English ability improvement strategy based on artificial intelligence wireless network is effective. The application of artificial intelligence products brings new vitality to learning and provides students with a large number of digital learning resources, but the following three aspects need to be paid attention to when using:

First of all, resources should be selected according to teaching needs. Various types of intelligent systems contain a large number of rich audio-visual resources, but students should also pay attention to the occasion and time of use. The audio-visual resources in the system cannot be completely separated from the exercises in the classroom. To properly and correctly use the audio-visual resources in the system, this type of software should play an auxiliary role and should not be applied blindly. The audio-visual resources in the system are not omnipotent. Teachers should choose according to the suitability of the teaching content to avoid the phenomenon of increasing the burden on students.

Secondly, in the process of use, teachers and parents should give proper guidance. Teachers need to guide students to use them correctly to avoid applications only for application. Teachers need to guide students to correctly use digital learning resources to ensure the quality of use. Parents should also supervise students properly so that when students use the intelligent system to learn, they can learn more. Efficient.

Finally, use the APP and intelligent system reasonably. The emergence of new technologies such as APP and intelligent systems has facilitated teaching, but it is also a double-edged sword. Teachers should use them appropriately in teaching. In the process of choosing new technologies
for teaching, they should also follow the new English curriculum concept and English law of teaching, the correct use of new technology tools, and the realization of the beauty of new technology tools in teaching.

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