Construction of Artificial Intelligence-Based Interactive Oral English Teaching Platform based on application problems of present intelligent products

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Abstract. This paper investigated the application status of current intelligent oral English learning products, summarized the most favourable products applied by college English learners and analysed their common feature, advantages as well as problems. The survey result shows that the present intelligent oral English teaching products have the merits such as rich teaching resources, correct voice scoring system and individualized assessment and interesting game bonus etc. However, there are also some demerits like lack of words choice judgement, real-time scoring and indicating system as well as interactive teaching platform required by both teachers and learners etc. Based on the above problems, the paper put forward an Artificial Intelligence-Based Interactive Oral English Teaching Platform, which includes all-round spoken corpus that can be updated by teachers, students and AI system all together, an On-line Teaching Assistant System aimed for monitoring, controlling and interacting with students in learning process and a modified scoring system offering real-time assessment for students’ speaking performance, with a view to improving students’ oral English proficiency in a better and more effective way.

1. Introduction

In terms of form that people master a language, spoken language generally takes precedence over written language[1]. However, in China, English learners have long paid more attention to English reading and writing, but neglected the importance of English speaking. Globalization and diversification of social needs put forward higher requirements for foreign language education in China. The requirement for foreign language competence is more and more reflected in the ability of oral English expression[2]. Oral level is one of the main indicators to measure second language competence[3]. The design of oral English teaching mode aimed at improving college students’ oral output ability has always been the top priority in College English teaching research, however, traditional oral English teaching design is limited by the lack of resources, the inadequate language environment and the relatively single content design, which cannot meet the desired teaching expectation[4]. Oral English teaching software based on artificial intelligence technology offers wide and flexible learning opportunity for students to practice oral English so they can improve their oral English proficiency both at home and everywhere in the world in an easier and convenient way. However, the teaching effectiveness and the applicability of intelligent oral English teaching platforms for both teachers and students are still unclear. Therefore, it is necessary and worthwhile to investigate the application status of current intelligent oral English teaching platforms and make some technological improvements due to present application problems.
2. Problems existing in current oral English teaching

Unlike teachers for English majors, college English teachers face a large number of students with different personalities, individual needs and learning requirements. What’s more, teachers are under great pressure in classroom teaching, academic research and homework checking. The new round of English teaching reform has shortened college English in-class teaching hours greatly. Hence, it is difficult for teachers to provide oral English speaking opportunities for each student in limited classroom time. Some teachers innovate the way that students hand in the homework by asking students to record oral English homework through WeChat etc., however, students can easily cheat teachers by reading rather than speaking words due to their laziness. Since teachers can hardly see students’ whole picture of oral work, it is hard for them to provide long-term, step-by-step and comprehensive oral guidance for each student. In the long run, students’ oral English output level and output quality cannot be guaranteed and the purpose of oral English teaching cannot be achieved.

Under this circumstance, students find their own ways to improve oral English proficiency, for instance, applying intelligent software online. However, according to a survey of 200 students, 20 percent of students keep study online for one month, only 8 percent of students keep study for more than one year, which shows the fact that most college students are still lack of self-control capability in self-learning process and need some necessary supervision from both teacher and intelligent system.

Figure 1. Students’ learning endurance when applying intelligent oral English software to improve spoken English

3. Artificial intelligence and its application in education

The State Council Government Work Report 2018 points out that we should strengthen the research, development and application of the new generation of artificial intelligence (AI). The study on application of AI in English teaching has drawn attention by education scholars both at home and abroad. For example, Dan Zhu, Lec. Utku KOSE and Ahmet ARSLAN. etc. analyzed the application of AI in College English teaching[5-6]. Xiaoguang Li, Yali Sun put forward the technical route of intelligent English teaching platform[7-8]. Rebecca J. Passonneau, Danielle MNamara etc. made survey on intelligent English writing and reading systems[9]. Jia Jiyou and Chen Weichao designed a Script-Based Human-Computer Dialog in Given Scenarios for English Learners in senior high school[10]. However, no one has made investigation and study on Intelligent Oral English Teaching System used by today’s college English learners. This paper investigates the application of various oral intelligent products, summarizes their advantages and disadvantages and puts forward interactive oral English teaching platform based on AI due to current English learning and teaching problems as well as students’ and teachers’ actual needs, for the purpose of providing data support and future reference for the application and development of AI products in oral English teaching.
4. Analysis of current oral English teaching platform based on artificial intelligence

Table 1 shows the most frequently used intelligent oral English teaching products by college students.

Table 1. Intelligent Oral English Teaching Products most used by college students.

| Rank | Intelligence Product | Products’ features |
|------|-----------------------|--------------------|
| 1    | NYSE: LAIX            | Real-time voice scoring technology can mark each syllable of words. AI English teachers based on in-depth learning technology can provide personalized and adaptive learning courses. It has leading English spoken language assessment and writing scoring engine. |
| 2    | kouyu100.com          | It contains Artificial Intelligence Oral Pronunciation Training, Intelligent Foreign Language Assessment and Correction Technology that can score each syllable as well as powerful listening and speaking platform that has strong anti-construction ability. |
| 3    | acadsoc.com.cn        | A large number of British and American films and television clips allow students to record and imitate the dialogue in the film to produce its own drama dubbing. It has an intelligent voice scoring system to correct pronunciation errors. Sentence-by-sentence, slow and non-destructive sound quality listening help with students’ better speaking. |
| 4    | Casually Speak        | Abundant dubbing video resources allow students to conduct scene-based video dubbing practice; a large number of selected video courses can be enjoyed repeatedly. Multi-scene dialogue and games arouse students’ interest. |
| 5    | 51 talk               | Rich content and learning mode enable students to learn easily and happily. Students can find oral learning partners to communicate on the platform. |

The advantages shared by these products are as follows: 1. AI platform with rich teaching resources such as films and TV series; 2. individualized teaching approach based on students’ oral proficiency; 3. teaching with games and assessment bonus for the purpose of promoting students’ learning interest; 4. voice scoring technology to improve students oral ability; 5. automatically sending messages to remind students to stick to learning schedule. However, there are some shortcomings too, such as lack of learning, recording and monitoring function capable of alerting, checking and controlling students’ learning habits; insufficient scoring mechanism without real-time voice comparison; scattered teaching materials come from the internet rather than from in-class book, which affects the students’ learning improvement etc.

5. Construction of Interactive Oral English Teaching Platform based on artificial intelligence

5.1. Creating a spoken English corpus to improve the quality of language expression

Oral output is a complex cognitive behavior. Speakers must focus on the theme, supervise the content of the speech, pay attention to grammar and pronunciation, maintain linguistic coherence and avoid repetition. At the same time, they should consider the needs of the listener and meet the requirements of the listener’s cultural dialogue[11]. The intelligent teaching software for oral English today didn’t involve students’ vocabulary selection assessment or judge students’ word application proficiency as well as the complexity in students’ oral English expressions. In addition, the software is mainly based on the commercial use of a company, which is not consistent with students’ daily classroom learning content, students cannot convert oral practice and knowledge learned in class into practical exercises through after-class AI platform assistance and students cannot get timely guidance from relevant
software or English teachers after class. Thus students’ learning outcome cannot be achieved and
guaranteed. At present, the corpus of intelligent oral English products is very complex, with many
contents arranged for certain examination and the selection for different columns is complicated
without proper guidance and instruction. Therefore, we should first establish a spoken English corpus
based on AI which is compatible for students’ daily learning materials so that students can easily
choose what to learn and make use of what they learned in class into real practice.

![Diagram of Oral Intelligent Recognition System]

Figure 2. Intelligent oral English teaching platform based on spoken English corpus

Extract useful words from book to build a corpus of oral English expressions around the subjects of
students’ textbooks, such as dining, shopping, internet, storytelling, etc. Each topic includes relevant
vocabulary, useful sentence patterns, paragraph and articles arranged according to the degree of
difficulty, with supplements of relevant oral teaching resources, such as news, video, movies and other
language resources and provision of a variety of communication scenarios for students to choose and
rehearse. Intelligent software is based on Oral Scale of China Standards of English to develop oral
output evaluation mechanism, evaluate students’ oral output quality and level and record students’
vocabulary usage habits and errors. By comparing students’ speaking performance with the best
scheme of vocabulary usage in intelligent corpus, it can provide more appropriate suggestions for
language selection and use and help students improve the quality and level of language output.

5.2. Building an Interactive Oral English Assistant Teaching Platform for both Teachers and Students

At present, students use intelligent software to learn oral English mainly through the method of
self-study, which is lack of proper guidance from teachers or intelligent systems, and their degree of
progress in English speaking is still unknown. There are fundamental differences between after-class
learning by applying intelligent software and Oral English learning instructed by teachers in class in
terms of content, form, teaching mode and training mode. Therefore, it is necessary to design an
English-assisted oral teaching system, which effectively combines after-class learning of students with classroom teaching of teachers, so that students can receive reasonable learning evaluation in the process of self-drilling and teachers can master students’ after-class performance through checking, supervising and reading data reported by AI system, which help achieve a virtuous circle of daily oral teaching and classroom management.

![Diagram of Artificial Intelligence-Based Interactive Oral English Teaching Platform](image)

**Figure 3. An Artificial Intelligence-Based Interactive Oral English Teaching Platform**

The Artificial Intelligence-Based Interactive Oral English Teaching Platform designed in this paper combines four users interactive with each other to support the system operation and enable effective oral English teaching and learning. Students can log on to the system anytime and anywhere to learn and practice oral English on Autonomous Learning Platform. Artificial intelligence gives self-diagnosis and historical practice diagnosis results based on their daily learning performance and arranges various types of exercises according to student’s individual problem. Experts are mainly responsible for maintaining the knowledge base, including the long-term fixed spoken language corpus and the timely updating spoken language corpus. Experts are usually teachers who have many years of oral English teaching experience. They can take the overall situation into consideration, add, query and modify the content of knowledge base. Expert is also responsible for maintenance of neural network sample to take some adding or modifying work. Each English teacher has a designated class and students and is mainly responsible for supplementing and uploading teaching materials, conducting daily teaching management, organizing tests and assessments, and analyzing the mastery of certain knowledge points of the designated student groups. Artificial intelligence updates the corpus with new background information uploaded by teachers, redesigns the best scheme of vocabulary selection, and regularly uploads students’ oral improvement and test results through big data and machine learning technology. The system administrator mainly conducts user-privilege management to permit experts and teachers to query, delete or modify some contents in order to guarantee the safe assurance of the system.
5.3. Improve the scoring system for real-time pronunciation and intonation assessment

The current oral English learning software has the function of correcting and marking students’ wrong English vocabulary pronunciation and providing corresponding phonetic hints and pronunciation exercises. Judging from the assessment of accuracy of word pronunciation, the technology is mature. However, compared with Chinese, the English phonetic system is more complex in terms of pronunciation, intonation, rhythm, stress and coherence between sentences. It is far from enough to evaluate it by present machine scoring system. Imitating movie speakers is a good choice and there are many oral intelligence teaching platforms offering movie resources to help English learners to practice and correct pronunciation, however, the evaluation and scoring mechanism of these AI platforms still needs to be improved. The intelligent oral English teaching platform proposed in this paper not only provides students with the resources of original sound dubbing materials of movies, which can be intercepted by students at will for dubbing, but also can make real-time comparison and screen indication of students’ pronunciation with the original sound of movies in terms of intonation, rhythm, sound length, word stress and liaison. It integrates the common speech processing modules, bottom recording and playing function modules, words parsing and displaying, synchronous adjustment module and real-time waveform display module, and takes into account the logical arrangement of these modules.

![Figure 4. The scoring system for real-time pronunciation and intonation assessment](image)

It can mark and indicate the pronunciation gap on the screen at any time, correct, propose and send intelligent voice errors to students, offer revise suggestions and record the times of students’ repeated exercises and progress as well as concrete evaluation. According to the errors often made by individual student, it generates development and progress maps and error corpus in the later stage to help students find and summarize oral problems by themselves and to establish a learning model that conforms to their own problems and standards.

6. Conclusion

Based on the research and results discussed above, the conclusions are obtained as follows: students prefer to apply intelligent oral English platform such as NYSE: LAIX, kouyu100.com and acadsoc.com.cn etc. to improve their oral English proficiency today. The common features shared by those products are AI platforms with rich teaching resources, voice scoring system and individualized assessment etc. The current intelligent oral English teaching platform has the following problems: lack of words choice judgment, without real-time scoring system and no interactive teaching platform.
for effective teaching. The proposed Interactive Oral English Teaching Platform Based on Artificial Intelligence includes all-round spoken corpus that can be updated as needed, an interactive Oral English Teaching System effective for knowledge conversion and a real-time scoring system for speaking performance assessment.

Acknowledgments
This work was financially supported by the Research Fund of Department of Basic Sciences at Air Force Engineering University (JK2019123).

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