Optimization of Oral English Teaching System Based on Computer-aided Technology

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Abstract. Oral English is an important part of English teaching, which is a necessary skill for English majors. However, the traditional oral English teaching system is only limited to some traditional teaching methods, mainly relying on the actual analysis and practice of classroom teachers, as well as the simple practice and rote memorization of students after class. Based on this situation, this paper will design a set of oral English teaching system based on the computer-aided learning system. In the system design, five functional modules are mainly considered: teacher and student user management, English listening training, English practical oral training, English homework release and oral learning history. In the design of the system, we mainly rely on the computer intelligent speech recognition system to realize the auxiliary teaching of spoken English classroom speech recognition, semantic analysis and speech synthesis. At the same time, this paper introduces the real-time update and download service of voice learning materials in the computer-aided voice intelligent learning system, which can improve the participation and integration of network resources in teaching. The experiment shows that the computer-aided oral English teaching system proposed in this paper can help students to form their own learning ability, improve their mastery of knowledge, improve their information-based teaching management ability, and ultimately maximize the effect of oral English teaching.

Keywords: Oral English teaching; information technology; intelligent speech recognition system; CAI; online resources;
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1 INTRODUCTION

As a basic language subject, English is becoming more and more important in the process of economic globalization. As the most important branch of the English discipline, the main teaching goal of oral English is to cultivate students' ability of using English to communicate proficiently, stimulate students' interest in learning oral English, and enhance their confidence in dare to

express [1-3]. However, the traditional oral English teaching method is too old, which is limited to teachers' classroom practice and students' rote memorization after class, so the traditional oral English teaching method deviates from the goal and purpose of oral English Teaching [4]. As an increasingly mature information-based teaching method in recent years, computer-aided teaching can help teachers to manage teaching to the greatest extent and assist students to learn independently. CAI technology includes computer network technology, computer technology and corresponding multimedia technology. Through the comprehensive application of these technologies, we can achieve the acquisition, transmission and storage of graphics, text, voice and other content, so as to realize the flexible management and distribution of teaching content [6-8]. At present, the computer-aided technology of oral English teaching mainly presents the two characteristics of teaching informatization and teaching informatization, but its corresponding application of information technology has not realized the corresponding teaching effect effectively, and it lacks certain intelligence [9]. Therefore, how to endow the CAI system with certain intelligence is the key to the design of spoken English teaching system.

Based on this situation, a large number of scholars and educational research institutions around the world have studied and analyzed the computer-aided teaching system of oral English teaching, and also given many schemes. American scholar Guo et al. [10] once proposed an automatic scoring system for spoken English test, which mainly uses computer software to score the corresponding spoken English documents and put forward corresponding improvement suggestions. This system has opened the first step of computer-aided learning and evaluation of spoken English. With the development of artificial intelligence technology, rose et al. [11], a researcher of British related companies, proposed a more advanced intelligent evaluation system for spoken English based on vector space model technology, human natural language processing technology and artificial intelligence technology, which mainly relies on multivariate analysis, and pays attention to the linear correlation between words, but the system is too complex. Merz [12] and other scholars from the University of Memphis in the United States have developed a self-help learning system for spoken English, which presents a variety of forms in learning, including media data, voice, video and image. In terms of the application of information technology in oral English teaching, Cheng et al. [13] have proposed to expand mobile information technology in the process of oral English learning, and at the same time to carry out the corresponding situational oral English teaching and cooperative learning. Kang et al. have proposed the computer-aided oral English communication technology, which mainly involves computer technology, using computer technology to carry out corresponding synchronous and asynchronous communication and interaction, so as to realize the interactive development training of oral English [14, 15]. Other computer-aided learning systems and researches on oral English also include oral English training system based on multimedia technology, oral English situational teaching design based on mobile Internet technology, etc. [16, 17]

In order to solve the problem of intelligent computer-aided learning of spoken English. In the design of CAI system, this paper mainly considers five functional modules: teacher and student user management, English listening training, English practical oral training, English homework release and oral learning history [18]. In the design of the system, we mainly rely on the computer intelligent speech recognition system to realize the auxiliary teaching of spoken English classroom speech recognition, semantic analysis and speech synthesis. At the same time, this paper introduces the real-time update and download service of voice learning materials in the computer-aided voice intelligent learning system, which can improve the participation and integration of network resources in teaching. The experiment shows that the computer-aided oral English teaching system proposed in this paper can help students to form their own learning ability, improve their mastery of knowledge, improve their information-based teaching management ability, and ultimately maximize the effect of oral English teaching.

The structure of this paper is as follows: the second section of this paper will focus on the analysis of the actual needs of the current oral English CAI, and give the corresponding software architecture and hardware architecture design scheme; the third section of this paper will test the

system based on the relevant students in a middle school and give the analysis of the experimental results.

2 DEMAND ANALYSIS AND THE DESIGN OF SPOKEN ENGLISH CAI SYSTEM

The computer-aided instruction system of spoken English designed in this paper is mainly based on the core artificial intelligence technology of intelligent speech recognition technology [19]. The whole computer-aided instruction system of spoken English includes two main parts: software architecture and hardware architecture. The corresponding teaching system framework is shown in Figure 1:
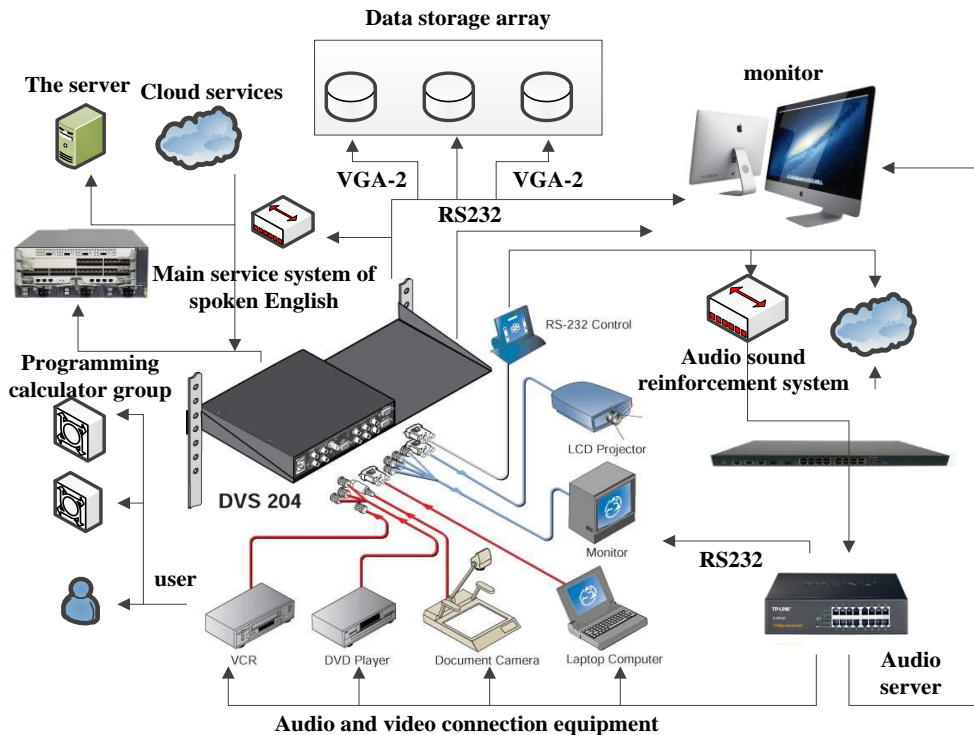

Figure 1: Design framework of spoken English CAI System.

2.1 Requirement Analysis

At the level of demand analysis, three main groups of people are considered: administrators, teachers and students. At the corresponding business analysis level, we mainly consider the student information maintenance level, oral homework release level, and student learning feedback and evaluation level. In the corresponding level of student information maintenance, the whole system needs a complete login interface, login process, and convenient for teachers to manage, maintain and other related human-computer interface operation design. In the actual design, it is necessary to consider the information error of students caused by students' dropping out, transfer and related personnel changes. The corresponding demand flow chart is shown in Figure 2. Based on the relevant student information flow chart in Figure 2, teachers can master the accurate information of the class they teach and manage the regular personnel. At the corresponding level of oral training needs, first, the whole system needs a scene selection for oral training, and set corresponding "voice text" and "text voice" interactive selection. In the interactive selection of "voice text" and "text voice", students need to make timely judgment of repeated

training and complete corresponding assignments. In the actual investigation, the oral training module also needs to have the function of correction and suggestions, so that students can strengthen their learning of voice and intonation while carrying out these two oral training modes, and constantly accumulate relatively authentic oral English expression. The demand flow chart of the corresponding oral English training is shown in Figure 3.
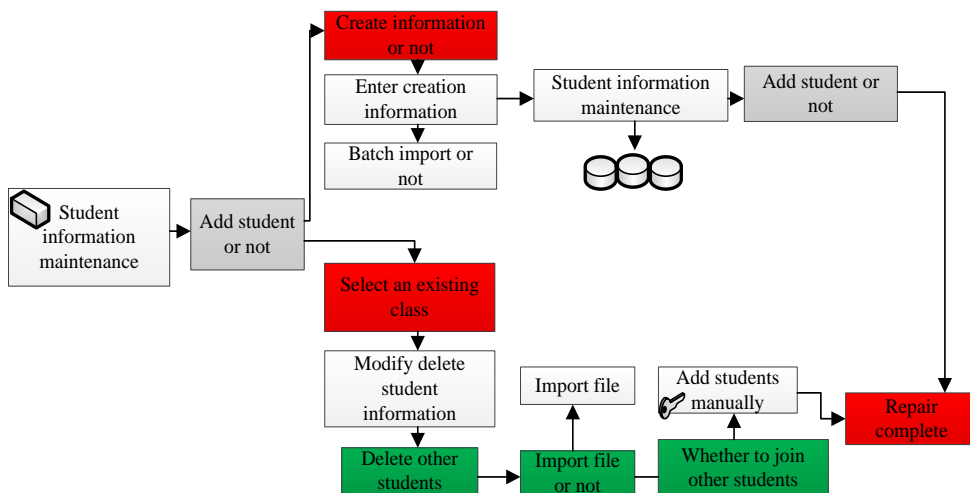

Figure 2: The framework of student information maintenance and flow in the oral English CAI System.
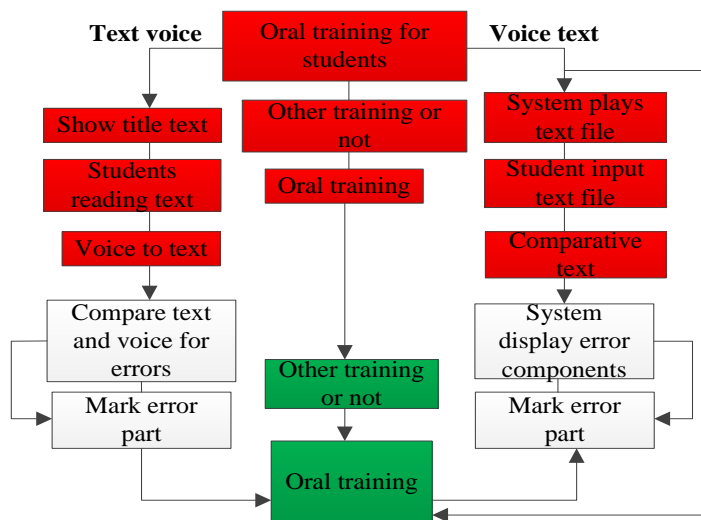

Figure 3: The demand flow chart of students' oral English training in oral English CAI System.

In addition, the functional requirements of the whole oral English CAI system are shown in Table 1. It can be seen from the table that the main system modules are four modules: administrator module, teacher module, student module and human-computer interaction login interface module.

Category	Function name	Details
Human computer interactive login interface module	Sign in	User login system
	Personal information maintenance	Password service
Administrator module	Oral training maintenance	Increase of oral training question bank
	Teacher information maintenance	eacher information addition and deletion
	Student information maintenance	Add and delete student information
Teacher module	Class system maintenance	Add, delete, modify
	Student system maintenance	Add, delete, modify
	Oral homework release	Add, delete, modify
	Oral performance analysis	Add, delete, modify
	Learning tracking	Add, delete, modify
Student module	Oral training	Autonomous Learning
	finish one's homework	feedback
	Learning history	self-examination
	Situation analysis and suggestions	self-examination

Table 1: Functional requirements of oral English CAI System.

2.2 The Design of Computer-aided Teaching System for Spoken English

At the system design level, it is mainly divided into software design and hardware design. The technologies involved include B / S architecture design, net technology, database technology and other information technology. The corresponding overall structure of the system is shown in Figure 4, which contains many functional sub modules.

A. Software architecture design

The software structure used in this paper is mainly B / S architecture, whose main architecture features have the following advantages when assisting teachers in Teaching: only the corresponding web browser needs to be installed to realize data interaction when the architecture is running; the corresponding B / S architecture can realize the restriction of user's authority and the data exchange between multiple users; the corresponding client is independent of the system

itself , only the relevant servers need to be upgraded. The corresponding architecture mode is shown in Figure 5:
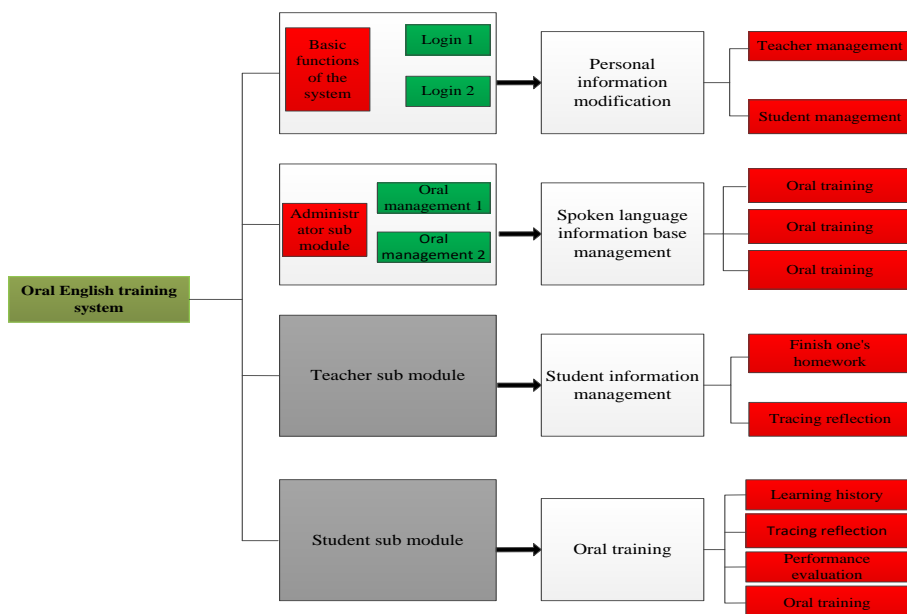

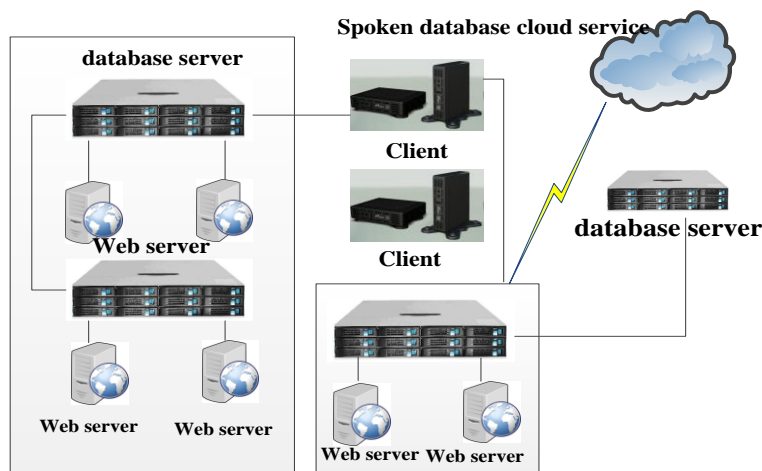**Figure 4**: The overall structure of the spoken English CAI System.

Figure 5: B / S architecture application mode.

B. Operation platform

On the running platform, the platform selected in this paper is net platform, which is mainly used to complete the web services and the corresponding agility services of the whole system. Its main components include the base class library, net language database, and its corresponding structure is shown in Figure 6. It can be seen from the figure that based on this development platform, all kinds of language libraries can be easily run, and its platform also has development It has the advantages of simplicity, fast development and fast operation.
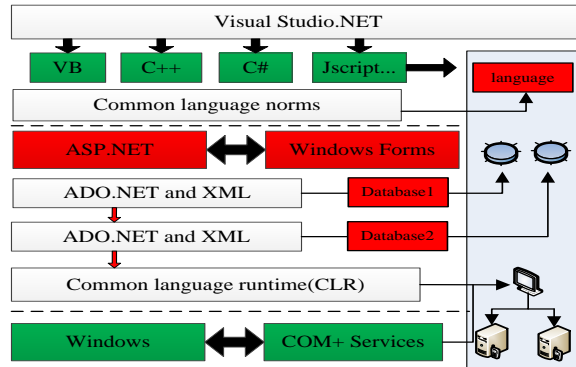
Figure 6: Net operation platform architecture.

C. Database construction

The database solution used in this system is SQL server. Its main features are as follows: it mainly adopts the standard client / server architecture, and the corresponding user interface is very simple, intuitive and convenient for users to use; its corresponding software has a variety of programming interface tools, providing more programming space; it can be fully integrated in NT, and it has good It is extensible and can be used across platforms; it can save information through mainstream browsers with low total cost.

3. EXPERIMENT AND DATA ANALYSIS

In order to verify the effectiveness of the computer-aided oral English teaching system in the actual teaching, this paper has carried out a class practice based on this system. The main test items include teacher system test, administrator system test and student system test.

A. Teacher module system test

The main test contents of the teacher system are shown in Table 2. From the response in the table, we can see that the corresponding teacher login part is very smooth.

Test module name	testing procedure	Test effect	Test for defects
Teacher login module	Enter the relevant user name and password	Log in the corresponding test system successfully	no
	Modify the login name of the system and save the operation	Complete the corresponding personal information modification	no

Table 2: Module test of oral English CAI System.

B. Student module system test

The student module test system is mainly about the effect of oral training test, and the corresponding test situation is shown in Table 3 below:

Test module name	testing procedure	Test effect	Test for defects
Teacher login module	Enter the relevant user name and password	Log in the corresponding test system successfully	no
	Modify the login name of the system and save the operation	Complete the corresponding personal information modification	no

Table 3: Module test of oral English CAI System.

At this level, the quantitative influence of the system on the students' oral English level is also carried out. In the actual data analysis, the statistical software of IBM SPSS statistics23 is mainly used. In the quantitative analysis, the mean value and standard deviation of oral performance evaluation are mainly used for evaluation and analysis. As shown in Figure 7, there are 5 groups of experimental statistics, 4 groups of experimental groups, 1 group of control group, and 50 students in the experimental group. There are four kinds of oral English teaching schemes involved in the experimental group, which are respectively: computer-aided oral English teaching group 1 and computer-aided oral English teaching group 2, traditional oral English teaching and traditional multimedia information assisted teaching. It can be seen from Figure 7 that the computer-aided oral English teaching proposed in this paper has obvious advantages in improving the performance.
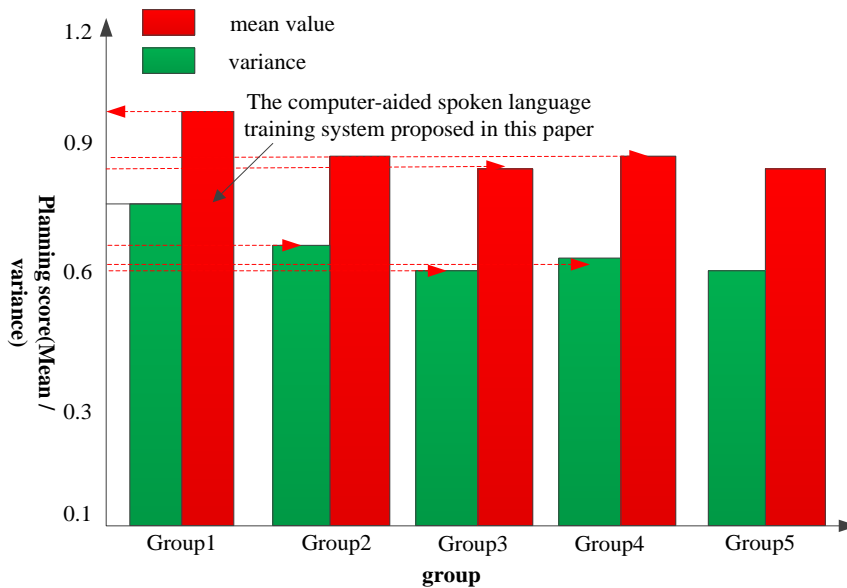

Figure 7: Comparison line chart of oral English scores.

In order to further analyze the long-term impact of the computer-aided oral English teaching proposed in this paper on the oral English performance of a single student, this paper conducts an experimental tracking analysis for a single sample, and the corresponding mean value and

variance of the oral English performance of the corresponding student are shown in Figure 8. From the figure, it can be seen that the corresponding student has experienced the long-term impact of the computer-aided teaching. The average score of oral English is significantly improved.
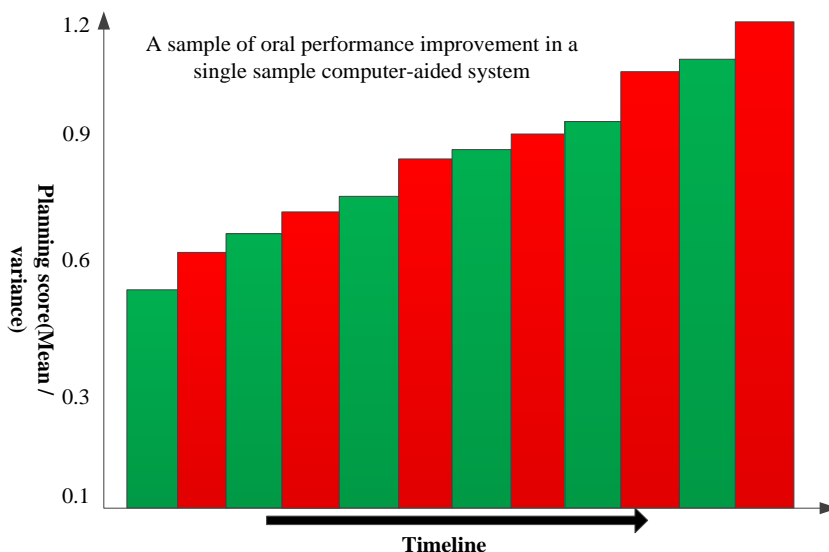

Figure 8: Broken line chart of individual oral English scores.

C. Administrator module system test

At the administrator module test level, the corresponding test results are shown in Table 4:

Test module name	testing procedure	Test effect	Test for defects
Administrator login module	1. Management of Teachers.2. Increase the corresponding information of Teachers.3. Save the corresponding operation	Log in the corresponding test system successfully	no
	1. Access to teacher management.2. Delete designated teachers and their information. 2. 3. Save	Complete the corresponding teacher information modification	no

Table 4: Administrator module test of oral English CAI System.

Based on the above-mentioned experimental tests, we can draw the following conclusions: the corresponding modules of the whole computer-aided oral English teaching system show a certain fluency. For individual students, the corresponding oral English performance under the influence of this system shows a steady upward trend, and the corresponding oral English has been greatly

improved. For teachers, the corresponding teaching effect of this CAI system has obvious advantages compared with the traditional English teaching effect, and the average scores of students' oral English show a significant trend of improvement.

4   CONCLUSIONS

This paper mainly analyzes the current global difficulties in oral English teaching, at the same time, it specifically analyzes the disadvantages and development trend of computer-aided oral English teaching. Based on this situation, this paper first analyzes the needs of the current oral English Teaching in detail, and designs a set of oral English teaching system based on the computer-aided learning system. In the system design, five functional modules are mainly considered: teacher and student user management, English listening training, English practical oral training, English homework release and oral learning history. In the design of the system, we mainly rely on the computer intelligent speech recognition system to realize the auxiliary teaching of spoken English classroom speech recognition, semantic analysis and speech synthesis. At the same time, this paper introduces the real-time update and download service of voice learning materials in the computer-aided voice intelligent learning system, which can improve the participation and integration of network resources in teaching. Finally, the experimental results show that the computer-aided oral English teaching system proposed in this paper has a very significant practical significance, but also achieved a very significant teaching effect.

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