



Design and Development of College English Online Teaching System Based on J2EE

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Abstract. In order to improve the effect of college English teaching and cultivate professional English talents who meet the needs of the society, this paper takes college English teaching as the research object and designs a set of online college English teaching system based on J2EE with the help of network information, database management, computer application and other technologies. Under the j2EE specification, the system adopts B/S structure to simplify the development process, the web server is written in Java language, the Springboot framework is introduced to complete the MVC three-tier design of the system, and MySQL is selected to realize the data support of a huge resource pool. The client is written in HTML, CSS and Javascript, and two subsystems, the student subsystem and the teacher subsystem, are set up. It has created a knowledge platform for English teaching and learning for teachers and students of college English majors, and provided a new model and new ideas for the development of college English majors and the training of national English talents.

Keywords: Internet + education · College English · J2EE specification · Springboot · computer application

1 Introduction

With the accelerated pace of world economic integration, China has become the largest trade country in the world, and the demand for English talents is increasing substantially. As an important way to export talents, colleges and universities are responsible for English education and English teaching reform. However, at present, college English teaching still adopts the traditional teaching mode, that is, teachers are the main body and students passively accept knowledge. Teaching media are mainly plane materials such as teaching materials and reference materials, which are not attractive to students. The professional level of teachers is uneven, and the distribution of high-quality teachers is uneven. The examination results under exam-oriented education are low in reference. All these problems lead to the low level of college students' English and their lack of practical English ability. [1].

Based on the above analysis, the author believes that we should make full use of Internet technology and computer application technology to design an online teaching system for college English, integrate educational and teaching resources, cover all

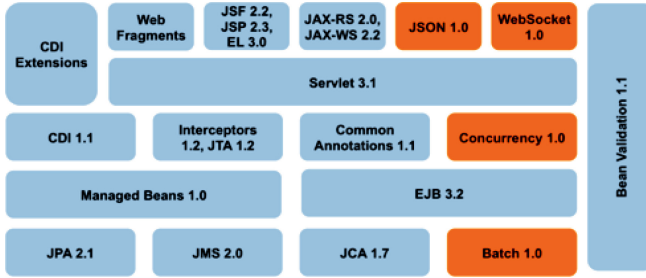


Fig. 1. J2EE components

learning directions of English, such as short sentences, listening, speaking, reading and writing, and provide students with ways and opportunities to practice English, so that English can become not only “knowledge” but also “skills”.

2 Key Technologies

2.1 J2EE

J2EE is a version of Java2 platform used to create server applications and services, including client layer, J2EE server layer and enterprise information system layer. J2EE components include client components (client applications and applet), server-side web components (servlet and JSP) and server-side business components (EJB). The specific components are shown in Fig. 1. [2].

2.2 Springboot

Springboot is a micro-service framework used to simplify the application development of Spring, which saves the tedious configuration problems and complicated deployment process of Spring, and provides a J2EE one-stop service scheme. [3].

2.3 Development Environment

According to the application requirements of related application technologies of college English online teaching system, the overall development environment is as follows: The basic development environment is Java, JDK version is 1.8.0_251, and eclipse2020 is used as the development tool, with Linux system. The webServer building framework is Springboot, the customer service building framework is vue.js, the database is MySQL, and the server is Tomcat1.8.0_251. [4].

3 Function Realization

3.1 Student Side

The Student side has three functions: video courses, audio resources and text materials.

The “video course” includes a large number of national English open classes, covering listening, speaking, reading, writing and translation, and a large number of foreign teachers’ video classes to help students improve their English systematically, comprehensively and professionally. The main technical difficulty of this module is the conversion of video format, and ffmpeg is used. [5] At the same time, this module supports the generation of data statistics and analysis to reflect the course quality, which is reflected in the search result ranking. Take the new course “Oral English Training-Tourism Direction” offered this semester as an example, as shown in Fig. 2.

The “audio resources” include listening audio of texts, listening materials of English exams, English speeches, excerpts of English movie lines and English news. Audio supports setting follow-up mode, downloading and creating local favorites. Follow-up mode means that there is a pause time after each sentence. The implementation code is shown in Fig. 3. [6].

In the “text materials”, there are all kinds of test reading real questions and some famous English publications and books. Text supports generating voice and downloading, uploading and writing text and generating reading audio [7]. The texts can be diaries, essays, reflections after reading, translated works, etc., which can be made public to

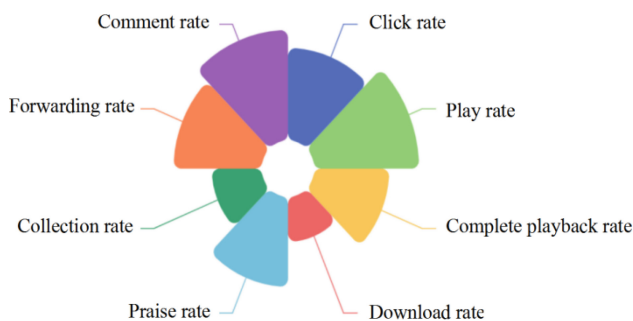


Fig. 2. Examples of course evaluation

```
// Set the audio stream format
Dispatch.put(spAudioFormat, "Type", new Variant(22));
// Set fileoutputstream format
Dispatch.putRef(spFileStream, "Format", spAudioFormat);
// Call the output file stream opening method, create a .wav file
Dispatch.call(spFileStream, "Open", new Variant("D:/voice.wav"), new
Variant(3), new Variant(true));
// Set the audio output stream of the sound object as the output file object
Dispatch.putRef(spVoice, "AudioOutputStream", spFileStream);
// Set the volume from 0 to 100
Dispatch.put(spVoice, "Volume", new Variant(100));
// Set the reading pause for 8 ~ 10s
Dispatch.put(spVoice, "Rate", new Variant(0));

Dispatch.call(spVoice, "Speak", new Variant(text));

System.out.println("Output the voice file successfully!");
```

Fig. 3. Code for implementing the follow-up mode

Table 1. Feedback form of students’ learning progress of four courses uploaded by a teacher

	Workplace English	News English	General academic English	Cambridge business English
Fu Yuheng (English Class 2)	100	64	0	12
Li Xu (English Class 3)	77	51	12	56
Hao Jiahe (English Class 2)	10	0	49	89

other users and graded. The algorithm used in scoring is fuzzy comprehensive evaluation model. Take an existing classmate’s work as an example, as shown in Formula 1. [8].

Firstly, let the factor set $U = \{ u_1, u_2, u_3, u_4, u_5 \}$, $u_1 =$ click volume, $u_2 =$ like volume, $u_3 =$ comment volume, $u_4 =$ collection volume and $u_5 =$ forwarding volume; The weight vector $A = [0.1, 0.2, 0.2, 0.3, 0.2]$. Determine the evaluation set (score) $V = \{E, G, A, P\}$ excellent, good, medium, poor, and then calculate the fuzzy evaluation matrix to get:

$$R = [r_1, r_2, r_3, r_4, r_5] = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0.21 & 0 & 0.9 & 0.625 & 1 \\ 1 & 1 & 1 & 1 & 0 \\ 0.79 & 0 & 0.1 & 0.375 & 0 \end{bmatrix} \tag{1}$$

Finally, the weighted average fuzzy synthesis is used to get the comprehensive evaluation: $S = 57.3403$.

3.2 Teacher Side

The functions of the teacher side are mainly the management of teaching resources, the supervision of learning behavior, and the maintenance of the system. Teachers are responsible for uploading, managing and deleting all kinds of resources, and check the learning progress (percentage) of students who upload their own courses, so as to keep abreast of students’ learning situation and adjust the course structure. Take the data feedback from a teacher’s account in our school as an example, as shown in Table 1. At the same time, teachers need to monitor the operation of the system, fix bugs in time, improve functions and enhance the stability of the system. [9].

4 Conclusion

J2EE-based college English online teaching system provides an “online + offline” teaching mode for college English teaching, provides a multi-angle and multi-level learning and practice platform for English majors, calls a large number of high-quality network resources to become learning media, and builds a rich and diverse think tank of English

learning resources, so that English learning can be integrated into students' daily life. In the future exploration and research, we will continue to deepen the reform of English online teaching mode, cultivate excellent English talents with professional knowledge and practical ability, and make contributions to China's economic development. [10].

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