Innovation and Application of English Online Teaching in Higher Vocational Colleges Based on ASP.NET Technology

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Abstract. With the rapid development of the "internet plus" era, information technology has gradually entered all fields of society, and profound and great changes have taken place, and the online English teaching mode has emerged as the times require. Therefore, the author has developed an online English teaching application system in higher vocational colleges. This system is based on ASP.NET technology, B/S framework and SQLsever database technology. This system breaks the traditional teaching mode, gives full play to the advantages of online and offline Internet, and promotes the development of teaching informatization. This paper analyzes the practical significance and application strategies of online English teaching mode in higher vocational colleges, aiming at improving English teaching mode, improving English teaching quality and promoting students' all-round development.

Keywords: ASP.NET · Higher vocational colleges · English teaching · Internet application

1 Introduction

With the continuous advancement of globalization, China's international status is also constantly improving, and the requirements of English talent reserve are also constantly improving. Therefore, China's higher vocational colleges should pay more attention to the development of English courses, and strengthening the cultivation of students' learning ability and application ability can help students lay a good English foundation in their future employment and life. English education in higher vocational colleges should not only pay attention to students' English knowledge, but also improve their overall English learning ability and application ability. However, due to the particularity of higher vocational colleges, higher vocational colleges pay more attention to the professional employment pressure, and the school pays more attention to the cultivation of students' professional skills, often neglecting the cultivation of students' English learning ability. Besides, most English classroom teaching in higher vocational colleges only teaches the solidified knowledge that stays in books. This process is a teacher-centered teaching mode, which will lead to the failure to take into account the different levels

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of each student's absorptive capacity and learning ability. Students with weak English foundation also lack channels and platforms to improve themselves by themselves. If they can't keep up with the classroom rhythm, they will suffer from lower learning efficiency, lack of learning motivation and fall into a vicious circle, which will lead to unsatisfactory overall teaching effect. Therefore, it is an urgent and important task to improve the teaching quality of English courses in higher vocational colleges [9].

After entering the 21st century, with the continuous development of science and technology, the whole world has entered the era of digitalization and informatization. Internet technology has been popularized and popularized continuously, and all walks of life have begun to use Internet technology to improve their work quality. China's "Education Informatization 2.0 Action Plan" pointed out that the country should create a "internet plus" talent training model, and then generally improve the information literacy of teachers and students and the application level of Internet technology, and promote deeper and more dimensional educational reform. Therefore, higher vocational colleges should make use of Internet technology to supplement and assist offline classes, so that online and offline English learning can be mutually beneficial and English can improve the quality of teaching resources. Pay attention to the individualized cultivation of students, and then cultivate more professionals for our country who are in line with the development of the national times.

In the current post-epidemic era, the teaching environment has changed greatly. Teachers need to adjust their teaching mode in time and learn to use Internet teaching technology to create a targeted learning environment for students [1]. According to the above analysis of various problems in the current English teaching situation in higher vocational colleges, the author of this paper believes that with the advantage of modern information technology, a B/S framework based on ASP.NET technology and SQL-sever database technology should be developed to develop an online English teaching application system in higher vocational colleges. Teachers can use the system to answer students' questions and give guidance.

Students can use this system to make use of the advantages of the Internet system that are not limited by time and space to choose their own learning content. For example, watching all kinds of online learning course videos, improving the application level through self-test of question bank, etc. The development of this system embodies the idea of combining traditional quality education with modern science and technology education, and changes into a teaching mode that highlights students' dominant position, creating a more diversified teaching system to develop students' learning ability. This system can not only meet the requirements of the current information education reform in China, but also improve the overall level of English teaching in higher vocational colleges [8].

2 Key Technology

2.1 ASP.NET

ASP.NET is a scripting language introduced by Microsoft, and it is also a web development platform based on. Net framework and developed from ASP. The platform absorbs many advantages of java and VB language development and has its own new features.

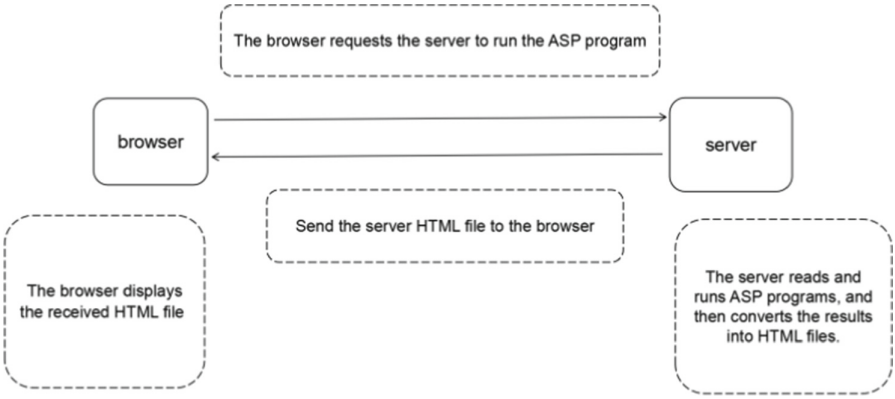

Fig. 1. ASP operation process diagram

The well-known main feature of ASP.NET is its open source, fast performance and lightweight cross-platform web development framework. The development methods of ASP.NET are diverse, and there are as many as three types, namely, the single-page model development method of web pages, the MVC model divided into model view controllers, and the event-driven model development method of web Forms. Developers can choose the development mode according to their own technical background and specific needs. In addition, ASP.NET also supports the development of dynamic server pages. Among the dynamic pages of the server, ASP.NET can develop script programs on the server side, so as to realize dynamic and interoperable web page applications. This mode of operation enables all subprograms to be executed on the server side, so that after the execution, the results can be directly returned to the client browser for display.

The advantage of this method is that it can effectively reduce the load of data transmission and operation on the client side. Compared with ASP technology, ASP.NET can not only realize view design, but also inherit the characteristics of hypertext format to transmit web page attributes, and achieve a more stable effect. Therefore, the operation mechanism of ASP.NET is similar to that of ASP, as shown in Fig. 1. The mechanism is that after the browser requests the server to run the ASP program, the server reads the request and runs the related ASP program, and then converts the running result into a front-end readable HTML format file and transmits it to the front-end client. After that, the browser client will show the back-end running results. This process can avoid the repeated reading and generation of codes, and each function is fully implemented. In this process, the running positions of many components can be flexibly arranged and changed, and only a small amount of hardware resources can be consumed to complete this work [7].

2.2 B/S

B/S is a very common network structure mode required for WEB application development, which is the browser/server development mode. The client only needs to install a browser, while the server installs DB2, MYSQL and other databases to realize the reasonable operation of web applications. All functions of web application can be realized

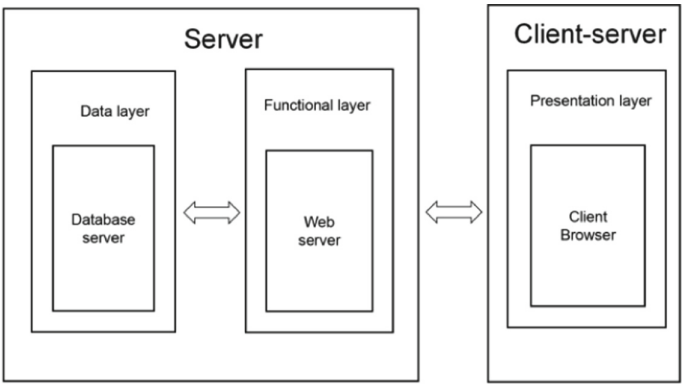

Fig. 2. B/S architecture diagram

by data interaction between these two ports. Most of the critical and difficult work of logical calculation processing in the application system under B/S architecture will be done on the server side, which can greatly reduce the memory occupied by the client side, because most of the consumed memory of the system is run and stored on the server side. The online English teaching application system in higher vocational colleges developed in this paper adopts B/S architecture, which can be maintained and updated through the server without installing a dedicated client. The file caching mode of servers under B/S architecture is usually distributed architecture [6] (Fig. 2).

2.3 Visual Studio

Visual Studio is an integrated development tool with complete functions developed by Microsoft Corporation. Therefore, the code written by VS can be applied to all platforms developed by Microsoft, and it is cross-platform. Developers usually choose visual studio when developing C-class language programs. Besides the basic functions of editing code, debugging code and generating new code, the development software has many additional tools. Additional tools include UML compiler, code controller and so on.

2.4 Exploitation Environment

The front-end system development of English online teaching application system in higher vocational colleges uses HTML + CSS + JavaScript language combined with Dreamweaver web development tool to compile code to develop concise and beautiful client pages, and uses JQuery to improve the user experience of interactive functions. The operating system required for this system development is Windows10, Visual Studio 2017 is selected as the integrated development environment tool, and IIS 6.0 is selected as the server building. The development language of the back-end server of the system is C#, and the development framework chooses ASP.NET's MVC model and uses B/S architecture. By developing the back-end in this mode, the tasks of the system can be developed in detail according to various logical functions, and the corresponding components and labels can be provided, which can effectively improve the development

efficiency of the application system. The database of the back-end server is SQL sever 2019 relational database. When we develop and create ASP.NET Web pages, we need to use the development environment set up in Microsoft Visual Studio 2017, select the command to create a new website in the menu, then select ASP.NET in the category options, name website1 and select the file location. The language will automatically select Visual C#. Click OK to complete the preliminary construction of the development environment [4].

These technologies have been widely recognized and used. Through the introduction of the above technology and operation process, the technical feasibility of developing English online teaching application system in higher vocational colleges is determined.

3 Requirement Analysis

3.1 Function Requirement

English online teaching application system in higher vocational colleges develops three clients: students, teachers and administrators. Users basically have the ability to operate and use the Internet system, and can basically adapt to every functional environment of the system. The system design still requires simplicity and simplicity, and the operation is simple. Try to have as few link levels as possible, which can make it easier for new users to quickly get started with the system. As a student, you can check the information of courses and learning announcements, check the scores of all your self-test questions and assignments, and submit your assignments in the designated opening time of a certain assignment. As a teacher, you can upload and maintain all kinds of teaching resources required by students, and answer students' various English learning problems in the teacher-student exchange message board. Administrators set permissions for teachers and students, and manage teachers' user information and students' information.

3.2 Holistic Design

The application system development framework of online English teaching in higher vocational colleges chooses ASP.NET's MVC model and uses B/S architecture. Therefore, the overall design framework of the system is roughly divided into client, server and database. The server is divided into presentation layer, business logic layer and data access layer according to MVC pattern. Layered design can separate all levels, which is convenient for maintenance, modification and optimization. Similarly, because the client can be isolated from the database without mutual interference, the client can access the database through the server's functions of security verification and permission control, which greatly enhances the security effect of the system. The presentation layer in the three-tier structure of web server is used to receive data input from student clients, teacher clients and administrator clients, and then call various functional subsystems developed and configured in the business logic layer to realize related functions of the system, and the presentation layer will also accept the processing results of the business logic layer and return them to the presentation layer. The business logic layer not only obtains data transmission and conversion data with the presentation layer, but also cooperates with the data access layer. When the data required by the client needs to call the

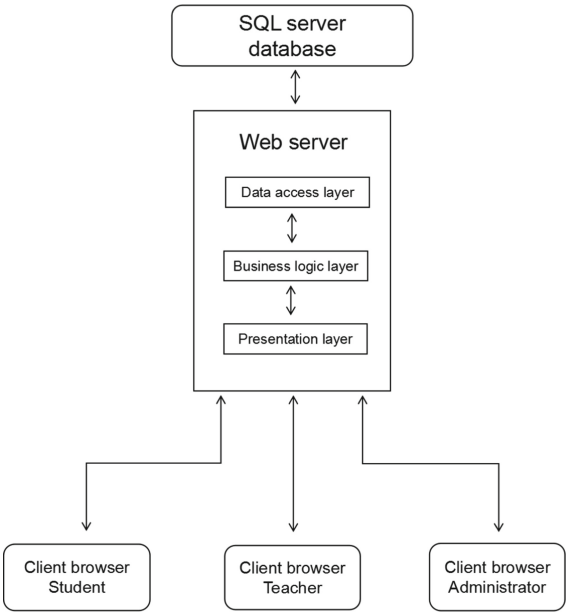

Fig. 3. The overall architecture of the system

data in the database, it connects to the data access layer through the functional module of the business logic layer, and calls the data access layer to realize the operations of adding, deleting, modifying and searching the database data. The final database layer is implemented by sqlsever, because the main advantage of sqlsever is that it belongs to Microsoft together with asp.net, so it is easier to use, and it also has the advantages of expansibility and easy deployment [5] (Fig. 3).

4 Function Realization

The application system of English online teaching in higher vocational colleges has developed three clients: students, teachers and administrators. Users log in to the system according to their own account passwords with different permissions. This article will mainly introduce teachers and students. After logging in, users can see the page layout of online learning, extracurricular learning, learning announcement and teacher-student communication in the homepage index.aspx of this system. After the page completes the form design, the data binding function is used to bind the display data of the corresponding columns. For example, "Learning Announcement" needs to establish a data binding relationship with the online English learning curriculum schedule, and "Information Management" needs to establish a data binding relationship with the teacher information table/student information table. The display control of each functional module column on the home page of the system will be bound with the field information stored in the corresponding database. Most of the display controls are in the form of DataList, and this process is data binding [3].

4.1 Student Client

Students log in to the home page with the correct username and password, and click on time to enter the online learning module according to the class time arranged on the online English learning course schedule in the "Learning Announcement". Students need to finish watching online English teaching videos within the specified time. During the learning process, users can repeatedly watch what they don't understand by pulling the progress bar. After watching the video, the system will automatically jump to the after-school homework page, where students need to complete the answers and submit them. After clicking the submit button, this lesson is marked as completed. Students can click into the "Extracurricular Learning" column in their spare time, which mainly includes functional modules such as "self-test of test questions" and "video appreciation". In the "self-test" module, students can answer questions anytime and anywhere, and each time the questions are random. Users can examine their English learning ability in this module. After the answer is finished, the system automatically scores and displays the correct answer. The "Video Appreciation" module includes such famous speech videos as Emma Watson's United Nations speech video, and such famous teacher teaching videos as Simon's oral English course. Click on "Teacher-Student Communication", and all messages will be displayed on the Discuss.aspx page through DataList control. After clicking, users can view the corresponding information, reply to the messages they care about, and post new messages. In the function module of the teacher-student communication message board, it is necessary to insert the latest message of each user into the message list of the receiving client in time. This function needs to call the Discuss.aspx.css code page, and the edited code object is btnDiscussAdd. And in this process, the message viewed by the user is displayed through data binding by using DataList control [10].

4.2 Teacher Client

Teachers log in to the system with the correct username and password to enter the homepage, and you can see the achievement management modules except the five main columns in the homepage of students. Teachers click on the student's homework score entry option, and this page shows all the students of this course. After teachers judge the scores according to the students' homework answers, they will enter the scores one by one. Click the submit button, and the scores entered by teachers will be automatically inserted into each student's homework score by ado.net. This function is realized by executing btnScoreInput command.

In the sub-function module of teacher-student communication, teachers need to check, answer and delete the academic questions raised by students. The functional realization of this operation requires the use of SQL's select, insert and delete statement codes so that the client can access the SQL database and operate on it. Similarly, these SQL statements can also be applied to teachers' operation function of modifying personal information. In particular, for deleting old passwords and confirming the setting of new login passwords, updateSQL statements are required, and the access to data in the teacher information table is also realized by ado.net. Teachers can delete and upload all video resources by clicking the extracurricular learning module. In the sub-module

```
ObjecetCmd.CommandText="INSERT INTO PaperTest(PaperID, RubricID,  Te
stMark)SELECT top"+intSum.ToString(+"+intParperID.ToString0+"AS
PaperID,RubricID,TestMark" FROM RubricInfo where
SubjectID="+SqlIDS.Tables["PaperPolicy"]Rows[i]["SubjectID"]+"and
LorelID="+SqIDS.Tables["PaperPolicy"].Rows[j["LorelID"]+"and
TestTupelID="+SqlIDS.Tables["PaperPolcy"].Rows[i]["TestTupeID"]+"an
d TestDiff=ORDER BY NEWID()";
ObjectCmd.ExecuteNonQuery0); //Execute SQL sentence, and return the number of
affectedrows (judge whether the execution of SQL sentence is successful or not)
```

Fig. 4. Realization of the function code of automatic test paper generation

of the self-test function of the system, teachers and users need to delimit the range of exercises and upload a large number of questions to the question bank, so that the random questions in the self-test can be different each time. Therefore, teachers need to classify and label the questions according to the characteristics of the subject, the teaching unit, the degree of difficulty and the type of questions in advance. After that, the system will randomly combine the test questions with genetic algorithm according to the labels to become new test papers. The realization method of this function is to use newid () function to obtain the ID numbers of all the labels in the question bank after naming the serial numbers of different classification labels, then use the algorithm of random function to select an ID number first, and then use this ID number to access the database again to retrieve the test questions of this classification ID many times. The return value is expressed as a Unique identifier statement, and every time the retrieved values are different, the extracted test questions are guaranteed to be different. The above process is realized by the Newid () function in genetic algorithm, and the specific execution code of Newid () function is shown in Fig. 4 [2].

5 Conclusions

Through the above analysis, the author believes that the development of online English teaching application system in higher vocational colleges can effectively improve the learning efficiency and learning effect of higher vocational students. For teachers, it can help to improve the overall teaching level of higher vocational campus, so that students can truly understand English knowledge and apply it to their life and even future work. Online English teaching mode does not mean that it completely replaces offline traditional English teaching, and plays a complementary and auxiliary role in offline classroom. Online and offline English learning can complement each other and achieve mutual benefit, thus realizing the innovative reform of information technology and English teaching. At the same time, it also puts forward new requirements for teachers and students to make effective use of the Internet teaching software system. Teachers should fully stimulate students' active learning interest in the future information-based English teaching practice, and integrate the Internet spirit into online classroom teaching design to achieve better teaching effect.

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