The Design and Development of Economics Online Teaching System Based on MOOC

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Keywords: MOOC, Economics, ASP.net, C #, SQL Server.

Abstract: With the continuous development of science and technology and the normalization of epidemic prevention and control, online learning is becoming more and more popular. Practice has proved that online teaching can make college education more effective. Therefore, using modern information technology and online high-quality educational resources, the author of this paper has constructed an online teaching system of economics based on MOOC. This system uses C# language for overall development, introduces ASP.NET framework for process building, and combines SQLsever database technology to set up two landing roles of students and teachers, so as to build an equal and open platform for the communication between teachers and students, and promote the common learning and progress of college teachers and students. It also provides a new model for economics education in colleges and universities, effectively improves students' learning interest and efficiency, and contributes to the cultivation of economic construction talents that meet social requirements.

1 INTRODUCTION

Since the 18th National Congress of the Communist Party of China, China's economy has entered a new period of high-quality development from high-speed development. The change of development mode has put forward higher requirements for technological renewal, policy reform and talent iteration, among which talent cultivation is the most important. As an important scene of talent cultivation in colleges and universities, it is necessary to carry out teaching reform according to the changing economic situation and policies. In the teaching of colleges and universities, economics is a very important course, shouldering the important task of cultivating economic construction professionals. But at present, there are still many problems in economics education in colleges and universities, for example, the update of teaching content is lagging behind, the teaching mode is single, the construction of teachers is backward, personalized education is ignored, and knowledge is valued over practice. If we continue to use the traditional teaching method of "classroom-centered, textbook-centered and teacher-centered", not only will the teaching work be ineffective, but it can't effectively match the needs of social posts, resulting in the disconnection between production and learning. So, colleges and universities began to actively carry out curriculum reform, including information-based teaching. Since 2011, three online teaching platforms, Coursera, Udacity and edX, have emerged. MOOC (massive open online courses), a large-scale open online course, has attracted people's attention, especially under the background of normalization of epidemic prevention and control. The Mooc of China's universities, Love Courses, Good University Online, School Online, Wanmen University, etc. have been launched one after another. After a period of practice, it has been proved that MOOC provides a new teaching mode for college education, which makes learning scenes break through the time and space constraints, realizes the high integration and optimization of teaching resources, cultivates high-level teachers, maximizes classroom interaction, highlights students' dominant position in learning, and realizes personalized education with big data cloud computing. Therefore, the establishment of MOOC-based "online+offline" hybrid teaching has become

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one of the important efforts of current college teaching reform.

According to the above analysis of various problems in the current teaching situation of economics in colleges and universities, the author of this paper thinks that we should actively seek online teaching schemes, develop an online teaching system of economics based on MOOC, use C# language for overall development, introduce ASP.NET framework for process building, and combine SQLsever database technology to build an online teaching system of economics in colleges and universities with rich resources and powerful functions.This system can effectively solve many problems existing in economics teaching in colleges and universities, promote the informatization process of economics teaching, and help to send more high-quality talents to the country and promote the development of China's economic construction.

2 KEY TECHNOLOGIES

2.1 Web

The Web is a distributed graphic information system based on the Internet, which transforms the information in the Internet into a visual and readable interface. All technologies that support Web operation are collectively referred to as Web technologies. There are five elements of Web technology: identification mechanism (such as URL), transmission protocol (such as HTTP and HTTPS), data format (such as HTML, XML, JSON), Web browser and Web server. These elements are divided into two categories according to their functional attributes, namely client-side technology and server-side technology. (Chen, 2019)

2.2 C#

The C# inherits the powerful programming ability of C and C++, and at the same time abandons many complicated and useless functions. It has unique advantages: cross-platform use (Windows, MacOS and Linux), complete open source (runtime, library, compiler, language and tools), compatibility (compatibility with. net Framework, Xamarin and Mono through. NET standard library), etc. It runs on. net Framework and. net Core, and becomes the preferred language for. NET development. (Tian, 2016)

2.3 ASP.Net

The ASP.net technology is developed from ASP technology, and it is a research and development method based on Web. The foundation of ASP.net is based on space and task-driven. The ASP dynamic server page, whose full name is Active Server Pages and Chinese name is Active Server Page. The development mode of ASP.net includes ASP.netWeb Form, ASP.net MVC, ASP.netCore, etc. Developers can choose the development mode according to their own technical background and specific needs. The working principle is shown in Figure 1. (Tang, 2022)

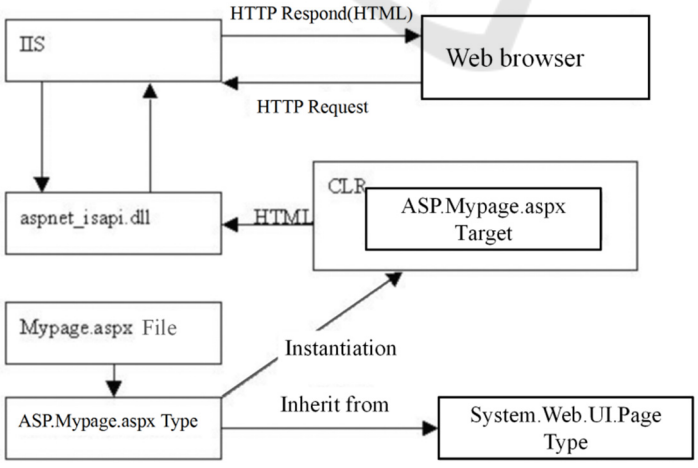

Figure 1: Schematic diagram of working principle of ASP.net

2.4 SQL Server

The SQL Server is a kind of relational database management system, which is widely used. Its advantages mainly lie in its scalability (applicable to various platforms, providing rich interfaces), integration (providing the function of data warehouse, and being closely related to many server softwares), ease of use (graphical interface, more intuitive and concise), and high efficiency (reducing the time and cost for users to manage data). By using this database, users can easily publish the required information and data on the Web, and users can view the data stored in SQL Server through common browsers. (Tang, 2018)

2.5 Development Process

According to the requirements of the above and related technologies, complete the configuration and deployment of the development environment of online teaching system of economics in colleges and universities. The system is written in C# language, with Windows10.0 as the operating system, IIS10.0 as the Web server, Visual Studio 2019 as the bottom development tool and SQL Server2019 as the database server.

First of all, configure the development environment for ASP.net, including the download and installation of IIS server, SQL Server database and VS2019. After the development environment is ready, click Visual Studio 2019 and select "Create New Project", and then select "Asp .Net Core Web Application" in the pop-up window. The new project is named "Economics Online Teaching System", and the framework "ASP.net Core 3.0" is selected to create a "Web application". Then, right-click the Solution "Add" New Project ", select the class library (.NET Standard), create a general class library named Common, and then add a CommonHelper class that can be called directly. In the "Online Teaching System of Economics" project, add a reference to the class library, call the static method under the HomeController of the "Online Teaching System of Economics" project, modify the data rendered on the Privacy page, select Kestrel mode and click Run. After that, we successfully designed the functions of each layer, and the specific functional modules are shown in Figure 2. After all the functional modules of the system are designed and implemented, a simulation test will be conducted. After the test is correct, all system files will be packaged and released, and deployed in IIS server. After the IP address is set, it can be used by all platform users.

With the introduction of the above key technologies and theories, the overall framework process of platform development is determined, and the feasibility of establishing and running the online teaching system of economics in colleges and universities is clarified.

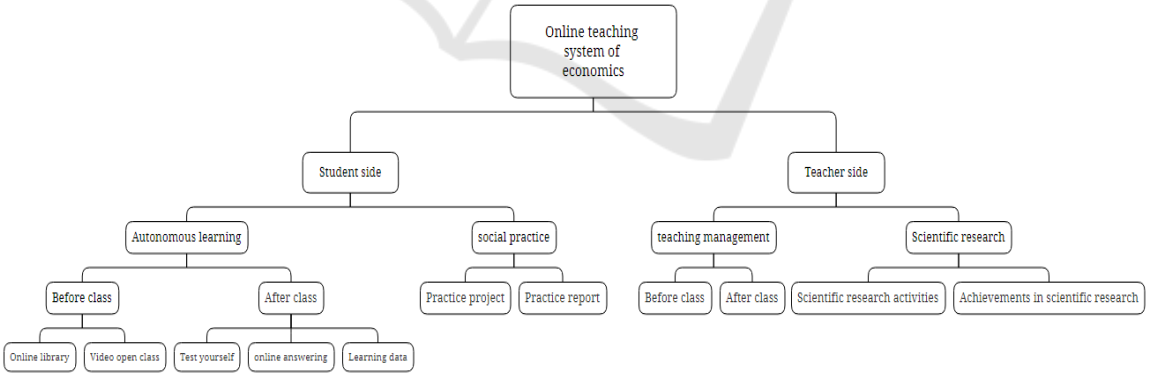

Figure 2: Design of functional module of online teaching system of economics

3 FUNCTION REALIZATION

3.1 Student Side

The students click to enter the online teaching system of economics, and click to enter the "Student Portal" to register and log in. After logging in, they will see the following two sections, "Autonomous Learning" and "Social Practice". The specific functional modules are as follows:

3.1.1 Autonomous Learning

As long as "autonomous learning" is exerted from the two stages of "before class" and "after class", it will complement the traditional classroom teaching, manage each part carefully and enlarge the teaching effect.

In the "before class" section, there are mainly two preview methods: "online library" and "video open class". In the "online library", students can view other electronic textbooks, supplement the textbooks ordered by the school, and borrow other related books. The system integrates a large number of authoritative teaching materials and e-book resources, and updates them in real time according to the economic situation and policy changes. In the "Video Open Class", a wealth of video courses of famous teachers have been collected systematically, such as Tsinghua University's Principles of Economics, Xiamen University's Network Economics and other series of courses. There are also front-line teachers' own explanation videos and live classes in our school. Students can make an appointment for live classes and receive the countdown notice. During the class, they can send barrage for real-time communication and interaction. The live class is mainly implemented by Asp.Net Core+Dapper+SQL Server, and some codes are shown in Figure 3. (Zhang, 2022)

```
public class ActionFilter : IAsyncActionFilter
{
    public async Task OnActionExecutionAsync(ActionExecutingContext context, ActionExecutionDelegate
    {
        var profiler = MiniProfiler. StartNew( "StartNew");
        using (profiler. Step("Level1" )
        {
            //carry out Action
            await next();
        }
        writelog(profiler);
    }
```

Figure 3: Live lesson implementation part of the code

After class, students can see three options: self-examination and self-test, online question and answer and study data. The students can choose the corresponding question bank of the course of study in "self-examination and self-test". Each question is randomly generated, including objective questions and subjective questions. After the answer is finished, the system will automatically give the scores, answers and analysis of the subjective questions, and the objective questions will be uploaded to the teacher for review. The "Online Q&A" has established an open platform for effective communication between students and teachers. In this module, students will see all the teachers of economics and related majors who have settled in the platform, and they can not only consult their own professional teachers, but also ask other teachers questions about economics. Teachers and students can discuss and study together. The "learning data" is a system that forms a visual report according to students' performance in preview before class and homework after class, including outstanding aspects, areas still lacking, areas of interest, etc. The purpose of helping students is to plan their learning time.

3.1.2 Social Practice

The "social practice" is mainly aimed at the problem that the traditional teaching mode emphasizes knowledge over practice, as long as the pre-work and follow-up work of practice are transferred online. In the "practical project", there are practical activities initiated by teachers, and there are also practical activities organized by students spontaneously. The students can check the information of practical activities, including time, place, main work contents and requirements for submitting practical reports, etc. Students can choose to join practical activities, and then they can communicate and exchange practical experiences in the activity group. In the "Time Report", students can submit practice reports in the form of words, such as practice reports, practical experiences, etc., or pictures or videos, such as activity photo collections, activity flash videos, etc. By publishing the practice report online, the individual learning results can be turned into collective wisdom.

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3.2 Teacher Side

The teacher clicks into the online teaching system of economics, and clicks into the "Teacher's Entrance" to register and log in. After logging in, you will see the following two sections, "Teaching Management" and "Scientific Research and Further Education". The specific functional modules are as follows:

3.2.1 Teaching Management

In the "Teaching Management" section, teachers are no longer leaders of learning activities, but guides. Before class, teachers' main task is to upload teaching videos or launch live broadcasts, and issue notices to guide students to preview before class. After class, the teacher needs to edit the questions and upload them to the system, and the system will automatically scramble the questions to generate the question bank. One test paper can be composed of several different questions, and the same question can exist in several different test papers. The code of the question bank is shown in Figure 4. In the "online question answering", teachers can give targeted answers to students' questions or initiate open topic discussions. We can check the "learning data" of each student, conduct one-to-one communication teaching according to the specific situation of students, reflect on the problems existing in teaching activities, and adjust the teaching mode. (Gu, 2022)

```
package com.mooc.model;
        //Introduction of package
/**
  *@author zhangzihui E-mail: **
  *@version V1.02015-1-15  AM  11:26:05
  * The questions are mainly used to form a test paper
  */
/*
  *questionType Topic type
  *1:Unidirectional multiple choice
  *2:multiple-choice question
  *3:True or False
  *4:subjective questions
  */
@Entity
public class Question{
      privateLongid;
    @Column( length-65538)
    private String name;          //Question name
    private inttype;              //Type of question (1 single choice, 2 multiple choice, 3 judgment, 4 subjective)
    private float point;         //Score of the problem
    private sringrigtAnswer;//Multiple choice questions are separated by commas.
```

Figure 4: Code of realization part of question bank

3.2.2 Advanced Scientific Research

The module of "further study in scientific research" is mainly aimed at improving teachers' personal level, starting from improving teachers' teaching quality to improve students' learning quality. In the "scientific research activities", teachers can choose to participate in all kinds of scientific research activities inside and outside the school. After the activities are finished, they need to submit corresponding reports in the "scientific research achievements". The reports can be seen by all teachers in the school, which can provide experience for other teachers and help to build a higher-level and constantly improving team of economics teachers. (Dong, 2019)

4 CONCLUSIONS

The online teaching system of economics can complement the traditional classroom teaching of economics in colleges and universities, and form a flexible and efficient teaching system of "online+offline". It can help college students grasp the opportunity of offline practice to exercise their skills while mastering professional knowledge. It is helpful for students and teachers to make progress together, improve the teaching effect of economics teaching in colleges and universities, and inject power into China's economic development. In the future exploration and research, we will continue to deepen the reform of online teaching system of economics, let online learning of economics exert greater influence, cultivate more professionals with

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solid professional knowledge and excellent professional skills, and make contributions to the sustained and healthy development of China's economy.

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