

# Research on Online Teaching Method of University Systems based on Artificial Intelligence

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**Abstract:** Online teaching plays an important role in modern education, and online teaching platforms have gradually become an important direction for the modernization of university education. Limited by technical factors, traditional online teaching platforms have problems such as small user capacity, poor carrying capacity, and poor stability. Therefore, to meet students' diversified online learning needs, in this paper, a new online teaching platform is designed based on artificial intelligence technology, and it can carry more concurrent users and meet the teaching needs of colleges and universities to the greatest extent in the online learning environment where there are many students.

**Keywords:** Online Teaching; Artificial Intelligence; University System

## 1. Introduction

As a key institution for cultivating professional talents, colleges and universities are faced with the challenge of how to use online teaching platforms to provide high-quality education effectively. Artificial intelligence technology, as a powerful tool and method, application of

online teaching platforms in colleges and universities. Teaching platforms based on artificial intelligence technology have many functions such as personalized teaching and intelligent learning resource recommendation, which can effectively solve the problems existing. Therefore, the online teaching platform of colleges and universities based on artificial intelligence technology is designed, hoping to provide theoretical support and practical guidance for the education.

## 2. Overall Framework Design of the Online Teaching Platform

To improve the scalability and maintainability of the platform, the Browser/Server. The overall framework consists of three parts: platform presentation layer, business control layer, and data access layer, as shown in Figure 1. Among them, the data access layer is responsible for interacting with the database to achieve data reading and storage; the business control layer is responsible for handling business logic; and the platform presentation layer is responsible for receiving user requests and displaying the corresponding interface to users.

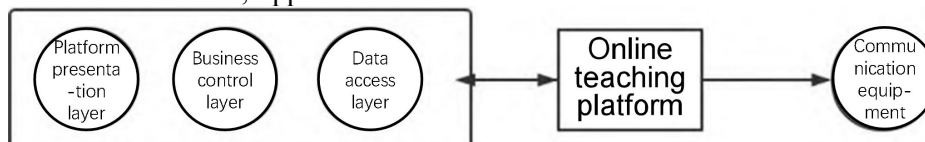


Figure 1. Frame Design of the Online Teaching Platform

## 3. Function Module Design of the Online Teaching Platform

The function module of the online teaching platform is mainly composed of four . as shown in Figure 2.

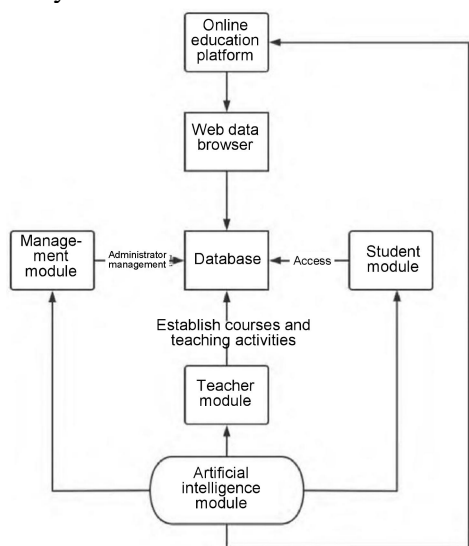
### 3.1 Function Design of Management

#### Module

The management module has functions such as authority management, administrator login, system settings, and platform page design.

(1) Authority management. First, assign roles. The administrator can create different roles. Second, set authorization. The administrator can set corresponding authorities for each role,

including course establishment, score entry, class management, etc. Third, role management. The administrator can manage the establishment, editing and deletion of roles to ensure the flexibility and rationality of authority allocation.



**Figure 2. Function Module of the Online Teaching Platform**

(2) User management. Firstly, add users. The administrator can add new teacher or student accounts, including setting usernames, passwords, and roles. Secondly, edit users. such as modifying passwords or roles. Thirdly, delete users. The administrator can delete the accounts of teachers or students to ensure the legitimacy of the operation. Fourthly, search users. The administrator can search teachers' or students' accounts through keywords.

(3) System settings. The administrator interface provides the system settings page, including options such as authority management, notification settings, and data

backup. Firstly, authority management. The administrator can set the authority of teachers and students. Secondly, notification settings. The administrator can set the notification method and content of the system, including email notifications, station letters, etc. Thirdly, data backup. The administrator can backup and restore system data.

(4) Platform page design. Developers should design the corresponding interface style and layout according to the platform function to ensure the consistency of the whole platform.

### 3.2 Teacher Module

The teacher module mainly has functions such as course application, teaching activity organization, online test, and student data editing, as shown in Figure 3. Teachers can easily manage their own teaching tasks and student information through this module function.

#### Course Application

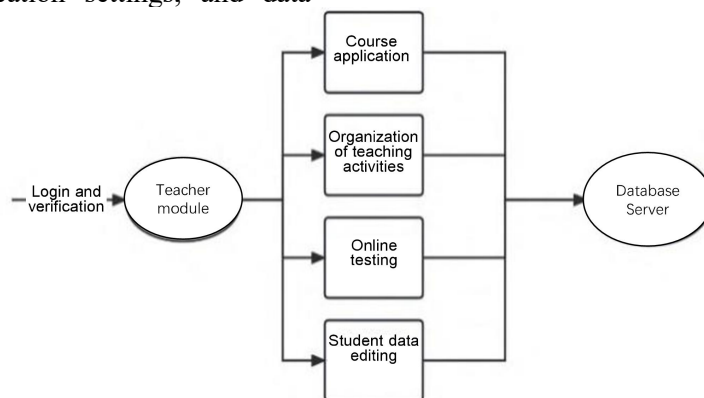
The teacher management interface shows the list of courses taught by teachers, including course name, description, and operation options (edit, delete, etc.). Teachers can create, delete, edit, and import courses.

#### Teaching activity organization

Teachers can design according to the teaching objectives, such as adjusting the schedule time, designing practical teaching activities, and organizing live teaching activities.

#### Student data editing

The function of student data editing is mainly to facilitate teachers to better manage students. Teachers can type in students' scores, divide learning groups, and carry out other operations on the interface.



**Figure 3. Teacher Module**

### 3.3 Student Module

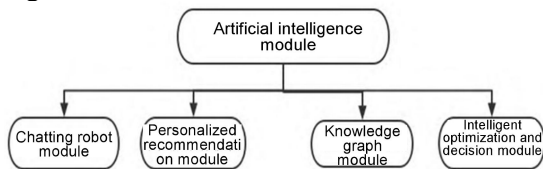
The core functions of the module include

course browsing and selection, learning resources and homework management, discussion and interaction. Firstly, course

browsing and selection. The student module interface will display a list of optional courses, including course name, teacher name, and operation options. Secondly, learning resources and homework management. Students can download learning resources in the module interface and submit homework. Thirdly, discussion and interaction.

### 3.4 Artificial Intelligence Module

The artificial intelligence module is mainly composed of chatting robot module, personalized recommendation module, knowledge graph module, and intelligent optimization and decision module, as shown in Figure 4.



**Figure 4. Artificial Intelligence Module Structure**

- (1) Chatting robot module. This module provides online dialogue services and can automatically respond to students' questions.
- (2) Personalized recommendation module. This module can analyze students' learning history and behavior data, thus providing users with personalized learning resources.
- (3) Knowledge graph module. This module establishes a complex knowledge network, which can connect different courses.
- (4) Intelligent optimization and decision-making. With the help of this module, the remaining capacity of users can be predicted. The specific examples are as follows.

The calculation formula of users' remaining capacity is

$$X=t/R \quad (1)$$

Where X is the user's remaining capacity; t is the total amount of user login; R is the total user capacity.

The real-time estimation formula of user surplus is

$$X=X_0-t_0/R \quad (2)$$

Where X<sub>0</sub> is the initial value of the estimation; t<sub>0</sub> is the number of user logins.

Through Equations (1) and (2), the remaining capacity of users can be estimated in real time, and corresponding control and management can be carried out to ensure the stability of the platform.

## 4. Performance Test of Online Teaching Platform

### 4.1 Testing Environment

The operating conditions of the platform are shown in Table 1.

### 4.2 Testing Samples and Methods

This test mainly aims to evaluate the stability of the platform in different environments and test whether the functional modules can run stably. To achieve these goals, the black box testing technology is used to design the maximum number of concurrent users of the platform. In this test, the test sample is set as the number of users of the platform, and the number of platform tests is set to 5 times. The peak and bottom values of the platform users are set in each test.

### 4.3 Result Analysis

As shown in Table 2, compared with traditional teaching platforms, the platform can carry more concurrent user numbers in each test, indicating that this platform can more stably support more users to learn online simultaneously under high load conditions.

**Table 1. Operating Conditions of the Platform**

Configuration	Content
Server	IntelXeonGold6240 processor
Operating system	Windows10
Database	SQLServer

**Table 2. Test Result Data**

Number of tests	Peak number of platform users/person	Peak number of platform users/person	Maximum number of concurrent users of the platform/person	Maximum number of concurrent users of traditional teaching platforms/person
1	500	200	480	450

2	1000	400	950	900
3	1500	600	1400	1200
4	2000	800	2000	1500
5	2500	1300	2500	2200

## 5. Conclusion

With the continuous development of network technology, traditional educational methods have been unable to meet the needs of modern education. In this paper, an online teaching platform is designed and realized based on artificial intelligence technology. The platform adopts a Browser/Server (B/S) structure design, which is mainly composed of a student module. The test results reveal that this platform can bear more concurrent users and has high feasibility, so it is better than the control group.

## Acknowledgments

The education and teaching research project of the Medical and Health Education Instruction Committee of Guangdong Higher Vocational Colleges "Research on the integration of Internet plus smart classroom construction and education and teaching - take the new campus of Zhaoqing Medical College as an example".

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