The Cloud Classroom System Based on Wechat Applet

Guang Zheng

School of Computer Science and Technology, Zhoukou Normal University, Zhoukou, 466001, China

Abstract

The technology community is a community of technology enthusiasts with similar interests. In the technology community, you can learn about the latest technologies and the latest developments in front-end development. Learn and communicate with friends who share the same interests and interests, and make progress together. But in most technology communities, there is still plenty of room for improvement in user experience and community openness. This article mainly uses Spring Boot frame and Java + Mysql to carry on the design and the realization to the front-end technology community, users can search and browse articles, evaluate and publish articles on this platform at any time and place by sign up, effectively and quickly carry out the front-end technology learning and communicating activities.

Keywords

Online learning; Wechat Mini Program; Cloud classroom; ThinkPHP.

1. Introduction

With the popularization of the Internet, students' learning methods are also diversified. More and more students take online learning as a supplement and improvement of knowledge. At the same time, due to the influence of COVID-19 this year, students can not go back to school to study. Although there are a lot of learning software in the market at present, its function is single and it cannot meet the needs of teachers and students. Based on the above, but also to meet the requirements of the teachers and students, cloud class on the basis of video playback, increase the education of information science, knowledge, information, announcements of the public, comment on interaction between teachers and students, students can learn at the same time in the study of the latest education information, at the same time through the interaction between teachers and students can make students' thoughts on collision, In order to stimulate students' interest in learning.

2. Research Status and Significance of the Project

2.1. Research Status

At present, we generally adopt the traditional offline teaching method, which requires certain learning conditions to carry out teaching and learning, which can not fully meet the needs of teachers and students. The existing learning platform on the market can only provide function of course watch, unable to popularization of education information, knowledge, information and preview, review interaction between teachers and students, and preview the announcement of the public such as operation, at the same time students before study also takes time to download the corresponding software, which virtually take up students' learning time, wasted mobile phone memory resources, It greatly reduces the user experience.

2.2. Research Significance

In order to meet the needs of teachers and students and make up for the deficiency of the existing online learning platform, the cloud classroom system is based on WeChat small program development, using WeChat as the carrier, without downloading software, does not occupy the memory resources of the mobile phone, can be used to scan the code or search attention, greatly improving the user experience. At the same time, the cloud classroom system meets the needs of teachers to release video courses and key knowledge information content, and also meets the needs of students to learn, communicate and view announcements anytime and anywhere on a software application.

3. Relevant Technology Introduction

3.1. ThinkPHP framework

ThinkPHP is a high performance framework designed for API development. It takes a new architectural idea, introduces many new PHP features, optimizes the core, reduces dependencies, implements true lazy loading, supports Composer, and has done a lot of optimization for API development.

3.2. Layui Framework

LayUI framework is a front-end UI framework written with its own module specifications, following the writing and organization form of native HTML/CSS/JS, with a very low threshold, ready to use. Its external simplicity, but without loss of full internal, light volume, abundant components, from the core code to the API every detail has been carefully carved, very suitable for rapid interface development.

3.3. WeChat Applet

The WeChat applet is an application that can be used without downloading. It is also an innovation. After nearly two years of development, we have constructed a new WeChat small program development environment and developer ecology. WeChat applet is also one of the innovation achievements that can really affect ordinary programmers in Chinese IT industry for so many years. Today WeChat applets cover 200 subdivisions of the industry, WeChat applets are also playing an important role in some major scientific research fields.

4. System Design and Analysis

4.1. System Functional Requirement Analysis

Cloud classroom system is an application for the development of teachers and students. In order to meet the needs of students to learn in an all-round way on an application, Cloud Classroom has developed the required functions of course viewing and information preview for students. At the same time, in order to realize the management of background data for teachers, a set of matching cloud classroom background management system has been developed. The system administrator is divided into two roles: general administrator and super administrator. The main work of general administrators is to upload learning materials. For general administrators, they should have the function of information management and course management. The main work of the super administrator is to ensure that the released information is legal, the data is classified reasonably, and the personnel is managed in an orderly way, so the super administrator should have the authority to review information, manage columns, manage users and so on.

4.2. System Function Design

According to the functional requirements of the system analysis, the whole system is mainly divided into three modules: student module, super administrator module, general administrator module.

The student module consists of four parts, namely, authorized login, information, course and my. By authorizing WeChat to log in to the student terminal of cloud classroom, students can preview information, watch courses, view my information and other operations. When previewing the details of the information, the information can be thumb up, comment, collection and other operations, if there is a document uploaded by the teacher in the information, you can click on the document for online preview. After entering the course module, students can not only watch the course videos, but also know the key knowledge points released by the teacher in advance, so that they can understand and grasp the key knowledge points in the process of watching the video course. If the teacher uploads the corresponding document, the document can be previewed online. My page is divided into my collection, announcement, about us three small modules, click my collection module, you can view the collection of articles. Announcements public module is to display the message or notice issued by teachers with super administrator authority. About our module is an introduction to our software or unit.

The general administrator can only add, delete, modify, query, search and other operations on the information and course module released by himself after logging in the background system. Due to permission problems, ordinary administrators are not accessible to other modules.

The super administrator can operate all modules, including column management, information management, course management, thumb up management, comment management, announcement management, user management, administrator management and other modules. The super administrator also has the right to review the information or courses released by the general administrator. Only the approved courses or information can be successfully displayed on the student side page.

5. Database Design

5.1. Database Demand Analysis

The demand of database mainly reflects the aspects of data saving, deleting, editing, searching and so on, which requires the database structure must meet the input and output operations of various information. According to the analysis of users' requirements for system functions, a database is created and named "cloud_paper".

5.2. Conceptual Design of Database

In database design, E-R diagram is usually used to describe the data structure in the requirement analysis phase by entities, attributes and the relations between entities.

5.3. Database Logic Design

The background database used in this system is MYSQL. According to the demand analysis of the database, the E-R diagram is obtained, and the entities and attributes in the E-R diagram are converted into the relational mode. This system mainly involves the core data table has the column table (CP_CATE), the information table (CP_NEWS), the course schedule (CP_VIDEO), the administrator table (CP_ADMIN).

The column list (CP_CATE) manages the information column and the course column, and provides the category of the column to which the information or course belongs. The column table uses the column category (Catetype) field to distinguish the information column and the course column, and the parent column ID (PID) field to distinguish the first-level column and

the second-level column. Through these two main fields, the function of storing multi-type columns and multi-level columns in one table is realized.

The information table (CP_NEWS) stores information uploaded by teachers. In this table, the author of information release is distinguished by the field of administrator ID (AUID), the column of information belongs to is distinguished by the field of CATEID, and the status of information is distinguished by the field of publication status. The above main fields and other fields as shown in Table 2 together constitute a complete information table. Tables are given the ability to store information uploaded by teachers.

Course Schedule (CP_VIDEO) stores course information, including course title, program, video path, release status and other information. In this table, the VCATEID field is used to distinguish which column the course belongs to, and the status field is used to distinguish the release status of the course.

The administrator table (CP_ADMIN) stores the information of the backstage manager, including login account, login password, name, mobile phone number, status value, role value and other information. The role value can distinguish whether the user is a super administrator or an ordinary administrator, and the status value can distinguish whether the administrator can log in to the background system. By combining the above fields with other data structures in Table 4, the administrator table has the ability to store the information of background administrators.

6. Detailed Design and Implementation

This system realizes online video learning, knowledge information preview and other functions. The system includes front page, data interface and background management system, many functions, system integrity. The foreground page (UI) is the system page that interacts with the user and is responsible for the collection of user data or the display of the processing results of the business layer. The data interface is composed of Model layer and Controller layer in ThinkPHP. The Model layer is responsible for data collection and processing, and the Controller layer is responsible for calling methods and data distribution in the Model layer. Background management system, using MVC thought and AJAX technology combined with ThinkPHP and Layui framework development and become, to achieve the data visualization management of the background database.

6.1. Course Modules

The course module is an online video learning module, which belongs to the student side and is also one of the most core functions in the cloud classroom system. Students can conduct online video learning through this module and also view the key knowledge points of this section, so that students can better grasp the key knowledge in the video learning. The main page of the module uses the sidebar layout. The left side of the main page of the course displays the first-level columns, and the right side displays the corresponding second-level columns under the selected first-level columns. Students click on the secondary column of the course to trigger SwitchRightTab event, and jump to the course list page by executing the navigateTo method. When the course list page is loaded, the onLoad function will be executed. In the onLoad function, the id of the secondary column will be obtained by options.id. After receiving the column ID, the interface conducts data query in the corresponding database, and then returns it to the front page in the JSON data format. After the front page successfully receives the data, the front page performs data rendering.

The course detail page is the specific display page of course information, which is composed of video playback, key points of this section and courseware data module. The video playback module is composed of thumbnail, play button and video playback component. After the

student clicks the play button, the Videoplay function is executed, and the Videoplay function aspoints the acquired course video address to the SRC attribute in the Video component. In addition, the base address should be stitching together before the acquired video address to perfect the video path and ensure the normal playback of the course video.

6.2. Knowledge Information Module

Knowledge information module also belongs to the student end, and is also one of the core functions in the cloud classroom system. The main function of knowledge information module is to display the key knowledge or relevant technical articles published by teachers. Students can review the key knowledge or learn new knowledge through the knowledge information module. When students click on the knowledge information list item to view the knowledge information details, the onPostTap event will be triggered and the page will jump to the news-detail.wxml page. When the detail page is loaded, the onLoad function in the news-detail.js file will be executed, which will receive the ID value passed by the list item. Then use the request method to request the corresponding interface in the way of POST, and display the obtained pictures, text, documents and the corresponding comment information into the corresponding component.

If there is a document uploaded by the teacher in this module, click the document icon to open the document online for online preview. When students click on the document icon, the program will execute the Preview function, which will request the QueryFilePath interface to obtain the document information. After obtaining the document information, downloadFile and OpenDocument functions will be performed to download and open the document. Thus, the online preview effect of the document is realized.

6.3. Administrator Module

This module is designed for administrators, belonging to the teacher side, teachers are divided into super administrator and general administrator two kinds of authority. The general administrator can only operate the information and course modules, while the super administrator can operate all modules. When the administrator logs into the system, the role value and ID value will be searched according to the account number and saved into the session super global variable, and the system will judge the administrator's authority according to the role. If it is a general administrator system, it will query the information released by itself in the information table or course schedule according to the administrator ID. If it is a super administrator, it will display the information released by all personnel and course information. When adding administrators, the system uses AJAX and the mouse losing focus event in JavaScript to asynchronously judge whether the administrator account exists. If the account exists, it cannot be added, so as to avoid account duplication and ensure the uniqueness of the account.

6.4. Column Management Implementation

Column management is the management of information and the classification of the columns of the course. The column management module adopts recursive algorithm to classify and merge columns, and meanwhile applies str_repeat function in native PHP to replace characters in the column list page, so as to realize the distinction between column levels. When deleting columns, CP_NEWS table and CP_CATE table query all the article information under the corresponding column through the cateid field joint table, and then delete the data through the delete method in the model layer. At the same time, in order to save server resources, files, photos and other resources can be deleted through the unlink function in native PHP after data deletion is successful.

6.5. Comment Management Module

This module is designed for information comment, it is to manage student comment. Students' comments on the information are stored in the database in sections. When the background system displays the number of comments on the information, it needs to query the linked tables and remove the repeated information. The model layer will return the number of comments after de-duplication and statistics to the controller layer. The controller layer uses array_merge function to merge the independent arrays into one array and renders the data to the corresponding label through volist in ThinkPHP, so as to realize the management of information comments.

7. System Test

Software testing is the key to ensure software quality and the main means to find software errors and defects. This system adopts the method of black box testing, black box testing is also called functional testing, mainly testing whether each function can be used normally. The tester checks whether the software works properly by entering or selecting predetermined data and then viewing the output.

8. Summarize

This paper is close to the market demand, combined with the actual development. Students can use the cloud classroom system to watch course videos, preview key knowledge points, educational news and information, comment and collection, etc. Teachers can log in the background to publish courses and information independently. Cloud classroom system to a certain extent, to satisfy the needs of the masses of teachers and students, but there are a lot of shortcomings, such as login authorization WeChat cloud students system, login authorization page will pop up again, intelligent cannot recommend students to focus on relevant information, background management module did not show the student's individual review information and so on.

References

[1] Zhao Yan. Construction of Information Service Platform of University Library Based on Web3.0 [J]. Journal of Henan Library Science. 2018,38(11):44-45+50.

[2] He Bo Wen, Zheng Jian. Design and implementation of BBS forum system [J]. Computer Knowledge and Technology,2018,14(18):42-44.

[3] Li Pengfei. Design and Implementation of Campus BBS Based on Web Technology [D]. Inner Mongolia University of Science and Technology.2019.

[4] LI J P, CHENG M L. Application development of Eclipse [J]. Computer Programming Skills and Maintenance,2016(16):31-32+58. (in Chinese)

[5] Xie Yi. Computer software Java programming characteristics and technical analysis [J]. Rural Staff,2020(01):166.

[6] Zheng Zhifang. The Importance of MySQL and Application Example of Cloud [J]. Computer Products and Circulation,2020(01):151.

[7] Zhang Feng. Changing Web Application Development Mode with SpringBoot [J]. Science and Technology Innovation and Application,2017(23):193-194.

[8] Hu Yuanyuan, Liu Fei. Web-based information exchange platform for college students [J]. Computer Knowledge and Technology,2018,14(19):71-74.

[9] Hu Jing. Application Design and Implementation of Database Technology in Computer Network [J]. Science, Technology and Economics Review,2019,27(13):15+14.