Development of Online Learning Platform for College Ideological and Political Education Based on SSH Architecture

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Abstract. Aiming at the problems of single traditional classroom teaching form and limited time and space in ideological and political education, the author of this paper develops and designs an online learning system of ideological and political education based on SSH framework. In this paper, the SSH architecture of Structs + Spring Framework + Hibernate, Java language and MySQL database are used to complete the system development. This system develops four main functional modules: learning resource library, self-test question bank, practice activity forum and online Q&A module, which has the advantage of strong flexibility without being limited by time, space and region. It can help colleges and universities guide students to actively participate in the practice of ideological and political education and form ideological and political concepts and ways of thinking, and then help college students to become excellent ideological and moral talents that meet the current social requirements.

Keywords: SSH · ideological and political · online learning · college teaching

1 Introduction

Ideological and political education in colleges and universities is an important part of China's educational content. It is an important way for students to learn ideological and political theoretical knowledge, an important method for students to have the ability to use ideological and political theoretical knowledge to solve and analyze problems, and an important measure for students to form legal, collectivist and patriotic thinking and ideas. It is an important position for colleges and universities to publicize and guide the construction of personality. Through college education, the popularization and socialization of ideological and political education can be realized, so as to cultivate qualified successors of the times. Ideological and political education exerts a subtle influence on students through national political views, moral norms and ideas, and the ultimate goal is to enable students to become outstanding talents with noble ideological and moral character who meet the current social requirements [2].

However, in the current campus classroom of colleges and universities, most teachers still adopt traditional teaching methods, using textbooks as the only teaching materials. Due to the limited conditions, the textbooks are too theoretical in knowledge content and

the quoted materials are too old, which will affect the teaching effect of ideological and political courses in colleges and universities to a certain extent. It is not only difficult to attract students' interest in learning, but also difficult to fully show the rich level and connotation of ideological and political education through a single teaching assistant.

Practice is the basic way to cultivate talents with core values in China. Therefore, in ideological and political education in colleges and universities, students should be guided to carry out campus practice and social practice activities, so as to cultivate students' value orientation in their daily behavior. Activities should ensure that all students can participate. However, in recent years, a large number of colleges and universities in China have expanded their enrollment, but the investment in manpower and financial resources is lacking, so it is difficult for campus construction to keep up with the expansion of schools. Therefore, many colleges and universities are short of practical teaching resources, which restricts the development of practical teaching [1].

At present, China has entered a new era of Internet. With the development of Internet, the society has entered the era of information networking. Internet can expand classroom boundaries, break the limitation of time and space, and thus make the theoretical and ideological education knowledge spread quickly, widely and effectively. Under the background of the new Internet era, the ideological infiltration of western countries has impacted Chinese people's way of thinking and cultural tradition virtually, and even subtly shaken the political and moral position of college students. Teachers are the main body of ideological and political education in colleges and universities. If we can't keep up with the trend of the times, the mainstream ideological and public opinion will lose its power, lose its voice, and lose its voice in the massive data, and even more, we can't play the role of bacon in cultivating new people of the times. Therefore, we should strengthen the research on the current situation of ideological and political education in colleges and universities under the background of the new Internet era, and explore the educational path of ideological and political education on the network platform [9].

Based on the above description, the author of this paper believes that the development of online learning platform for ideological and political education in colleges and universities based on SSH framework combined with Java language can effectively solve the above problems. Teachers can communicate in class, share information, release curriculum tasks through the system, check students' learning progress and homework completion through the system, and offer after-class counseling through online question and answer. Students can make use of a variety of extracurricular videos to supplement their knowledge and expand their thinking. Through the notices of various ideological and political practice activities published by the system forum, students can get information in time and participate in practical activities. This system has strong flexibility, is not limited by time, space and region, and has the advantages of openness and timeliness of feedback. The development of this system can seize the historical opportunity of digital development, promote the popularization of ideological and political theory teaching, strengthen the mental arm of college students' ideological and political theory in the form of informationization, and make college students shoulder the important mission and responsibility of spreading and practicing ideological and political theory, and grow up to be qualified successors of the times.

2 Technical Overview

2.1 Struts

Struts is a simple and easy-to-understand WEB application development framework based on MVC. Struts has many characteristics, such as flexibility, reusability, open source and modular components. Tomcat, turbine and many other Apache software also have the characteristics of open source. Struts has the advantage of opening the source code of the framework, so that users can deeply understand the internal structure of the framework, and it is more convenient to develop projects based on servlet and JSPs, which makes the framework more practical, and only needs to simply implement business logic in the code.

Struts users can flexibly use the powerful and rich taglib tag library functions to improve the overall development efficiency. Therefore, taking advantage of this advantage, JSP development in the domestic environment only needs JSP's own markup, so it is unnecessary to develop new markup. The establishment of page navigation can make the hierarchical structure and logic of the system clear. Therefore, page navigation is undoubtedly an important direction to optimize the development of web pages. By using Struts framework to configure files, we can understand the overall structure of the development system and the relationships among its components through page navigation, so that the subsequent development and maintenance of the system will be more convenient [5].

The overall operation principle of Struts framework is shown in Fig. 1. After the user sends an operation request to, the response path is first filtered by a filter, and then processed again by an interceptor before or after the action and result processing. The response result can be produced by responding to the request of the request action class. Interceptors include built-in interceptors and custom interceptors that come with Struts itself. You can choose one of them. It is not difficult to see that using Struts can make the whole response process simple and clear, which contains typical MVC ideas. Because the Struts implementation presentation layer is based on webwork, it will provide corresponding components for models, views and controllers. Besides, providing a standard tag library can simplify the data interaction between view and model processes. The advantage of this architecture is that developers and users can invest more time and energy in key business analysis and logic development.

2.2 Spring

Spring framework is not only a web application development framework of JAVA platform, but also a practical inversion control container (IOC). The important feature that Spring has been widely used by developers is its open source and openness. Spring provides a good integration way for other existing frameworks. Therefore, any developer's Java-based application can use the core functions of the framework. For example, when users use JavaEE Enterprise Edition to apply spring, they can further expand the functions of existing web applications. It is because of the characteristics of openness and open source that spring is widely used in Java community. Many developers use spring framework as a supplement or even a replacement framework for Enterprise JavaBeans.
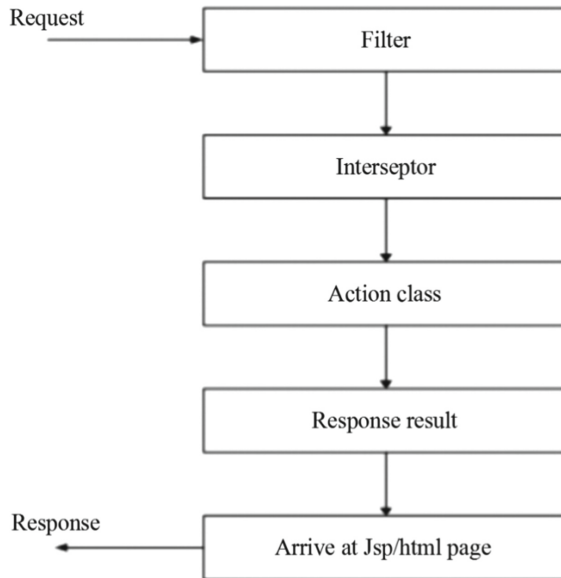
Fig. 1. The Struts framework request/response process diagram

Spring can also use javabean other than EJBs to design and implement some functions [10].

The core functions of Spring are Aspect Oriented Programming (AOP) and Control Inversion (IoC). If AOP function and IoC function can be applied reasonably, the dependence of each group price can be effectively reduced, and the coupling degree between program levels can also be reduced. The Ioc of Spring can manage the life cycle of objects, so that developers don't need to manually operate this process, and then developers don't need to pay too much attention to the dependencies among various objects, thus effectively simplifying the development process. AOP can effectively improve the code reuse rate, because it can decouple the system services, and in addition, it can effectively realize the business logic between systems.

To sum up the above, this paper thinks that Spring is an excellent framework in JavaEE development, and it should be adopted to develop the online learning platform of ideological and political education in colleges and universities.

2.3 Hibernate

Hibernate is a Jdbc-based framework with the characteristics of open source and persistence, and it is an excellent object-relational mapping ORM. It can effectively solve the problem of data interaction between objects and relational databases, so it can greatly simplify the coding work of DAO layer. And that map relation between object and database table needs metadata, and ORM which map object relationship can use these metadata to persist the object of Java application and then save it in the table of relational database. In this way, users can complete the operation of tables in the database only by operating Java objects. The principle of Hibernate's ORM is shown in Fig. 2. The
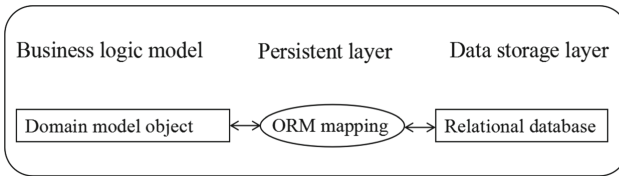
Fig. 2. Schematic diagram of the ORM for the Hibernate

domain model object at the business logic model level and the relational database at the data storage level can provide a connection channel through the relationship mapping of Hibernate's ORM object at the persistence level [6].

2.4 Development Environment

In this part, this paper briefly introduces the related technologies used in the development of online learning platform for ideological and political education. This system is developed based on the framework of Structs 2.3 + Spring Framework 5.3.2 + Hibernate 5.3. The development environment is myeclipse9.0, the relational database is MySQL 8.0.28, and Navicat for MySQL is used to visualize the database. Choose Apache Tomcat 9.0 for server deployment.

First, open myeclipse and create a new Web Project project. Select jdk version 1.8, Tomcat version tomcat9, next → next check the web.xml configuration file, and finish. Then you need to import the Jar package, import all the Jar packages into the lib folder, and then open the web.xml to configure Spring and Struts. Then, by configuring the application-Context.xml file, the transaction processor and configuration file of Hibernate are built. The last step is to configure JDBC as MySQL-connector-Java-bin.jar. At this point, the complete SSH framework has been built. The choice of system architecture and key implementation technologies is very important. According to the analysis of the relevant technologies of the current era, it is considered that it is technically feasible to build an online learning system of ideological and political education based on the above technologies.

3   Requirements Analysis

3.1   Functional Requirements

The online learning system of ideological and political education based on SSH architecture analyzes the functional requirements of teachers and students. Considering the needs of students, the system needs to provide students with the function of learning the theory of ideological and political education in the form of playing videos. In addition, students need to self-check their learning knowledge by answering questions, and provide online communication channels for students to seek help from teachers when they encounter problems. Starting from the needs of teachers, the system needs to provide teachers with the functions of uploading and maintaining all kinds of resources required
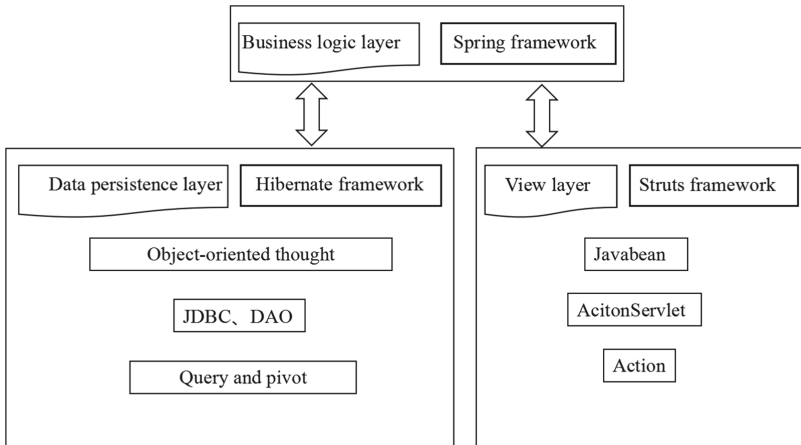
Fig. 3. Overall framework diagram of SSH system

by the system. In addition, the system needs to provide a platform for publishing ideological and political practice activities in colleges and universities to promote college students to participate in practical activities.

3.2 Global Design

In the overall design part, the author designs the technical architecture of the online learning and teaching platform for ideological and political education, and the overall frame diagram of the system is shown in Fig. 3. This system is designed with B/S architecture, and its development is divided into two parts: server and browser client. The system is designed based on MVC pattern and processed by three-tier architecture, which can separate the system components and effectively reduce the coupling. Moreover, most of the business logic can be concentrated on the server side for processing, which will speed up the efficiency of system development. The system is divided into three layers: the view layer, the business logic layer and the data persistence layer. Here, each layer is introduced in detail [3].

View layer: This system uses Struts combined with HTML + CSS + JavaScript technology to design the visual layer. The function of the view layer is to accurately display the information and data that users need, and the display screen should ensure the friendly interface and simple operation. Not only that, the view layer also needs to have certain verification ability. When the user makes an error operation at the client, it will send out an error instruction prompt to ensure that the data is accurate and effective in the transmission process.

Business logic layer: The function realization of the system depends on the business logic layer to design algorithms and codes to ensure the rational operation of the whole system. The business layer also serves as a link between the persistence layer and the view layer, and the user access view display layer realizes the related operations of the data layer through the reality of the business logic layer. However, it is the core feature of the business logic layer to separate the business logic, which can effectively reduce

the coupling degree of programs. Spring used in this system serves as the business logic layer of the system [7].

Data persistence layer: The data persistence layer is the lowest layer of the whole system architecture in the hierarchical structure. In this system, Hibernate framework is used as persistence layer, which realizes the related operation of data in MySQL database.

4 Functional Implementation

In the online learning system of ideological and political education based on SSH architecture, according to the different needs of teachers and students, two user ports of teachers and students are developed. When different users log in, the system will judge the user port according to different roles. In this process, the compiled code can be judged by calling the interface. The judged code is shown in Fig. 4. The main development functions of this system include four major functional modules: learning resource library, self-test question bank, practice activity forum and online Q&A module.

4.1 Student Client

Students click to enter the learning resource library module, and they can see two sub-modules of online learning and extracurricular supplement. Students can learn the theoretical knowledge of ideological and political education by clicking the "Start Watching Video" button through the online learning module. When students feel that their knowledge accumulation is not enough, it provides a platform for students to check the knowledge they have learned anytime and anywhere. In addition, in the extra-curricular

```
public String userLogin(){
  if(userFlag==0){
  //Student stu =
((StudentService)this.service).findByUsername(model.getUsername());
  StudentService stuService
=(StudentService)this.service;
   Student stu =
stuService.findByUsername(model.getUsername());
  if(stu!=null)
ServletActionContext.getContext().getSession().put(Student.USER_KEY,
stu);
   return"userLogin";
   }elseif(userFlag==1){
   Teacher tea =
teaService.findByUsername(model.getUsername());

   if(tea!=null)
ServletActionContext.getContext().getSession().put(Teacher.USER_KEY, tea);
   return"userLogin";
   }elseif(userFlag==2){//admin
   Admin admin =
adminService.findByUsername(model.getUsername());
   if(admin!=null)
ServletActionContext.getContext().getSession().put(Admin.USER_KEY,
admin);
   return"adminLogin";
   }
   returnERROR;
   }
```

Fig. 4. User classification code implementation

supplement module, students can browse the resources of ideological and political education for extra-curricular supplement and expand their extra-curricular ideological and political knowledge. The resources include video and graphic materials. Including a series of content videos with Chinese characteristics in the new era, telling stories of historical figures' virtues, various hot events and major international events and news in combination with history, so as to expand my extracurricular ideological and political knowledge field. In the extra-curricular module, students can feel the charm of ideological and political knowledge from history and modern society, strengthen their patriotism and achieve the purpose of ideological and political education. Students click into the self-test question bank module to test their answers and self-test, so as to consolidate their memories of the theoretical content of online learning at any time, thus achieving the purpose of deepening their ideological and political understanding. Students click to enter the practical activity forum module, which includes the exhibition of activity results and the registration module of practical activities. Practical activities that can be held include caring volunteer assistance activities related to ideological and political education, celebrity theme lectures, theoretical knowledge contests, ideological debate contests, etc. The content of the activity module includes the return pictures of successful practical activities, the experience expressed by participants, and the commendation of outstanding students. Students in the practice registration submodule can see the list of practice activities sorted by the holding time, and click to select their favorite practice activities to jump to the practice activity notification and publicity page. Students can sign up for practical activities at the designated place according to the instructions in the page details. When students have doubts about the knowledge in the process of theoretical study of ideological and political education, they can ask questions in time through the online Q&A module, and solve the problems through online communication with teachers [4].

4.2 Teacher Client

Teachers can screen out the resources and test questions that meet the requirements of ideological and political education according to the students' situation and upload them. For all kinds of learning resources already in the system, teachers can also do maintenance operations such as adding and deleting them. Teachers can also find out the specific situation and progress of students' online ideological and political study by checking the data of the correct rate of students' self-test in the system and the length of online study as feedback. Teachers can learn about students' knowledge according to the information provided by the system. Teachers can distinguish students with different levels of learning ability and absorption according to their learning situation, and then make personalized teaching contents with different difficulties for students at different levels according to their characteristics, so as to improve the effectiveness of teaching contents. Teachers can judge the students' actual learning situation through the questions raised in the online Q&A module after the students' online learning courses, and make appropriate adjustments to the follow-up teaching plans and teaching plans. In the practical activity forum module, teachers can check the students' participation in practical activities and delete the false information published in the forum [8].

5 Conclusions

As the last line of defense for students to enter the society, the university stage is the most important and favorable period for cultivating talents' core values. Therefore, colleges and universities in China must attach importance to ideological and political teaching and practice teaching, actively promote the ideological and political course to the whole course, deepen the reform of ideological and political education, and deeply integrate the fundamental task of moral education into college education. It is necessary to integrate Internet thinking and means into ideological and political education and establish a new teaching mode, which can effectively improve the efficiency of ideological and political education, and then provide the motive force for colleges and universities to cultivate high-quality and high-educated talents.

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