



Design and Application of Digital Network Education Platform for Economic Management Major in Colleges and Universities Based on PHP Language

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Abstract. First of all, this paper expounds the importance of teaching reform of economic management major in colleges and universities from the perspective of “four new” construction, then analyzes the current teaching situation of economic management major in colleges and universities, and then puts forward corresponding solutions according to the current situation. We developed a digital network education platform for economic major based on B/S architecture and MVC design pattern, and applied PHP language and Laravel framework to build the overall architecture of the system. Combined with the course content and specialty particularity of economic management major, we built specific functional modules, and the functions of storing, adding, deleting and checking system data were handled and operated by MySQL data. By using online teaching system as a supplementary teaching way outside the classroom of economic management major, it can improve the teaching quality of economic management major and students’ mastery of economic management courses, thus achieving the effect of optimizing the teaching mode of economic management major.

Keywords: economic management · Online teaching · PHP language · Laravel framework

1 Introduction

In order to promote the construction of “four innovations” (new engineering, new medical science, new agricultural science and new liberal arts) put forward by the state, it is necessary to push higher education forward to modernization in all aspects and improve the quality of talent cultivation in colleges and universities, so as to achieve the great goal of strengthening the country with higher education [1]. To achieve this goal, China’s higher education has gradually transformed from large-scale and high-speed development to comprehensive construction with high quality, high connotation and high literacy. It is necessary for the existing disciplines in colleges and universities to break through the inherent patterns and try new “contemporary” and “frontier” problems and challenges, so as to make an effective response to the current and future information

society and knowledge ecology. As a comprehensive discipline with the intersection of arts and sciences, the reform of the teaching system of economics majors has a positive impact on optimizing the main structure of education and promoting coordinated development, and plays a vital role in cultivating talents in both economics and management [2]. So, it is of profound research significance to analyze the present situation of economic management education and deeply explore its development trend, which will lay a solid foundation for the future development of economic management education. The teaching reform of economics and management major should adopt a new teaching mode to improve the teaching quality. If the traditional teaching mode is still followed, it is difficult to guarantee that the students of this major can acquire more professional knowledge and skills. When reforming its teaching mode, we should fully combine the characteristics of economics and management major and formulate effective teaching plans so that students can make steady progress and promotion [3].

Based on the research on the teaching work of the major of economic management, this paper finds that the teaching work of this major mainly has the following shortcomings: the students of this major need to learn a lot of theoretical knowledge of economic management, there are few opportunities for interaction between teachers and students after class, and most students are not clear about their learning ideas. In the long run, students' enthusiasm for learning will inevitably decline, thus affecting their learning efficiency. The setting of economic management curriculum model is not reasonable enough. Under the background of constructing "four innovations", students lack practical opportunities relying on the industry. Due to the low level of informatization of teaching in colleges and universities, students can't get the latest industry trends and professional knowledge in time, thus reducing students' interest in course learning. At present, the teaching methods often used in the teaching of economic management majors are outdated. If universities do not innovate and optimize the corresponding courses, it may greatly lead to a serious disconnection between students and the industry. If colleges and universities still arrange teaching tasks according to the traditional teaching mode, but do not innovate and optimize the corresponding courses, it may greatly lead to a serious disconnection between students and the industry. If universities want to change the teaching situation of economic management major, they should first integrate the information-based teaching mode into the teaching reform of economic management major, and increase students' enthusiasm and interest in learning courses. Then, we should create an environment to keep a good communication and interaction between teachers and students, so as to increase the interest of the teaching of economics and management, and thus achieve the purpose of in-depth study [4]. Especially under the background of the times with the Internet as the main information hub, colleges and universities are required to be good at combining teaching with the characteristics of the times, creating a brand-new educational scene for students, so that they can really master the professional skills of economic management while upgrading their academic qualifications, thus cultivating more outstanding talents. I think that online teaching is a mature form, and its application in the innovation of teaching mode of economic management major can play a certain role in promoting it. Therefore, this paper will use web technology to develop the digital network education platform for economic management major, adopt B/S mode and PHP programming technology to build a perfect teaching

system, set up a discussion module to facilitate the interaction between teachers and students, and integrate the idea of school-enterprise cooperation to improve the current teaching defects, so as to seek a new teaching path for economic management major and optimize the current teaching mode.

2 Technical Overview

2.1 PHP Language

PHP is the abbreviation of Hypertext Preprocessor. As a scripting language, it has high versatility and open source. The grammar of PHP is designed and developed based on scripting languages such as C language, java and Perl, absorbing its high-quality features and injecting new content. The language of PHP is relatively easy, and it is similar to C language in terms of programming standards and syntax. The code is very operable and easy to understand, so it is widely used by programmers in the development field of web site server. As compared with other scripting languages, the dynamic page made by PHP embeds the written application into HTML hypertext markup language documents, which is much faster than CGI. The compile code can also be executed in PHP, and that compile code is safer and faster. The PHP language is one of the mainstream scripting languages for web application development. It has the advantages of low development cost, fast running speed, high portability and rich function libraries, so it is favored by the majority of web developers.

As a language for developing dynamic website programs, PHP's specificity needs to be reflected in the application process, and the quality of PHP program design will have a direct impact on the running efficiency of the website. Because PHP has great advantages in data transmission and processing ability and input and output level, it is widely used in Windows operating system and various Web servers. While PHP is connected with the database with a large amount of stored data, it can broaden the link surface and reduce the pressure of data storage, data retrieval and maintenance. Following the update and iteration of technology, PHP's own search engine can implement personalized service classified collection and storage according to users' differentiated preferences, and the data execution efficiency has been greatly improved [6].

Compared with PHP5, PHP7 adds many new functions. Next, briefly describe the most important functions: PHP7 incorporates PHPNG code, which is twice as fast as PHP5 and improves the running performance of PHP; PHP 7 reasonably optimizes the utilization of resources and effectively reduces the memory consumption; The updated scalar type declaration can enforce parameters and return types; The PHP7 consistently supports the computer operating system of 64-bit architecture; Improve the abnormal level; The interface of secure random number generator and empty merge operator are newly added, as shown in Fig. 1, namely the sample code of empty merge operator, which is a complete substitute for using boolean-exp in combination with isset () function; By supporting the added return types and parameter types and anonymous addition mechanism, anonymous classes can be used as a substitute for complete class definitions [7].

```

<?php
    interface Logger {
        public function log(string $msg);
    }
    class Application {
        private $logger;
        public function getLogger(): Logger {
            return $this->logger;
        }
        public function setLogger(Logger $logger) {
            $this->logger = $logger;
        }
    }
    $app = new Application;
    $app->setLogger(new class implements Logger {
        public function log(string $msg) {
            print($msg);
        }
    });
    $app->getLogger()->log("My first Log Message");
?>

```

Fig. 1. Sample code of null operator

2.2 Laravel Framework

The Laravel is an open source and free framework of PHP, which is powerful and easy to understand. Its development follows the MVC design pattern, as shown in Fig. 2, which is the directory structure of Laravel. The app folder is used to store the core code files of applications, and most of the written codes are stored in this directory. The Controller folder in the app is used to write and store the controller files of applications. Routes.php is the routing file that the framework holds for route assignment and mapping; The public directory is where the framework's entry file and static resource files are stored. Http class files, such as user.php and menu.php files in the directory above, are the application model files. The config directory is the configuration file for all programs. Resources/Views is the application's view directory [8].

Laravel reused the existing components and functions of other php frameworks such as CodeIgniter, Yii and Ruby on Rails, which enriched Laravel's functions, greatly helped to create Web applications, and greatly improved the development speed of web applications. It contains namespaces and interfaces, which can help to organize and manage resources. Using Laravel framework to design web applications is more structured and practical. On the premise of being familiar with Core PHP and Advanced PHP, it is easier for program developers to use Laravel for development. The website based on Laravel framework is extremely secure and can prevent multiple network attacks. Using Laravel framework to develop Web applications is more scalable.

The Laravel framework has the following characteristics: 20 libraries and modules are built in the Laravel framework, and the modular design is beneficial to the enhancement of application programs. The dependency manager integrates Composer with each module to achieve the effect of simplifying and updating; Laravel has high testability, which contains test functions and help programs available for various test cases. The test functions can maintain the code according to the requirements; Laravel provides routing service, which is a method that allows users to flexibly define routes in Web applications. Routing can provide a better way to expand applications and improve the performance

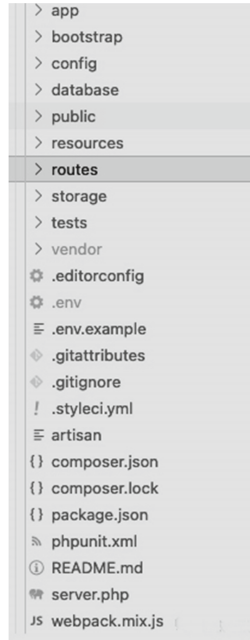


Fig. 2. Directory structure of Laravel

of applications; The Web application designed by Laravel will run in different system environments, and its configuration will change with the change of environment. Laravel provides an effective way to deal with configuration-configuration management; The query generator and ORM are integrated in Laravel. The query generator is helpful to query the database by various simple chain methods, and the object-relational mapper is used to realize Eloquent's ActiveRecord [9].

2.3 Development Environment

Homestead is a set of Laravel development tools published on Laravel's official website. Homestead is an integrated development kit, which includes Nginx Web server, PHP 7.3, PHP 7.2, PHP 7.1, MySQL, PostgreSQL, Redis, Memcached, Node and the necessary contents for developing Laravel. The computer does not need to install PHP, Web server and other server software, which avoids the disorder of the operating system in the installation process. It can run on any Windows, Mac and Linux system. The virtual system consists of virtual machine box and Vagrant control script. Usually, we call the virtual system built by Homestead Homestead. Homestead is an Ubuntu Server virtual machine built on a computer host and managed by Vagrant. The next step is to build the development environment of Homestead, install VirtualBox, Vagrant, git client and Homestead, and create the Homestead.yaml configuration file, which will be placed in your Homestead directory. As shown in the Fig. 3, it is the configuration command in Homestead.yaml. We can use the following command at the terminal to

```

folders:
  - map: D:\wnmp\www\project1
    to: /home/vagrant/project1
sites:
  - map: homestead.test
    to: /home/vagrant/project1

```

Fig. 3. Configuration commands in Homesstead.yaml

add laravel/homestead box to Vagrant. Configure shared folders and Nginx sites. Modification of mysql configuration, ssh into the virtual machine, and adding “sql_mode = “ ”command in [mysqld]”, and finally restarting the MySQL server. In order to support real-time message notification, you need to configure the installation method of laravel-echo-server: NPM Install-G Laravel-Echo-Server. The establishment of Homestead integrated environment ensures the feasibility of the development of digital online education platform for economic management majors in this paper.

3 The Needs Analysis

3.1 System Requirements

Taking the “four new” construction as the background, colleges and universities need to provide professional teaching guidance for students in the process of teaching economic management majors in combination with the actual situation of economic management courses. During practical application, first, we should set a clear goal of talent training; Second, it is necessary to have clear teaching objectives, so that students can make progress through the study of economic management courses. Due to its particularity, the major of economics has higher learning requirements for students. The basic theoretical knowledge and relevant laws and regulations that students need to master are very complicated and seriously out of touch with practice [10]. Therefore, it is necessary to integrate the idea of school-enterprise cooperation into the teaching of economic management, which can well realize the combination of theory and practice, understand the latest situation of the industry in the process of study and practice, and master the real skills required by the industry. The digital online education platform for economic management majors in this paper divides users into teachers and students according to their needs. The specific functions of the student end include learning basic knowledge, professional practice, live courses and online discussion, which can not only solve the problem that theory and practice are not closely combined, but also enhance the interaction with teachers. Teacher’s main job is to guide and supervise students’ learning and answer questions online and in real time.

3.2 Overall Design

The design of the digital network education platform for economic major in this paper is based on B/S architecture, with PHP as script development language and MySQL

```

<?php
namespace App;
use Illuminate\Database\Eloquent\Model;
class Student extends Model{
protected $table= 'STUinfo';
protected $primaryKey= 'STU_ID';
}

```

Fig. 4. Code example of Laravel's data model

database for data interaction. Laravel framework and MVC design pattern are adopted as the design framework of the system. As the user wants to access laravel application through the browser, the browser first sends a request to the Web server, which responds to the request and forwards it to laravel's routing engine. After receiving the request from the server, the corresponding routing engine locks the redirection component to the corresponding controller class method based on the configuration. And then call the controller class to take over. The control class in the web can be regarded as the transfer station of the program. Under specific requirements, the controller will immediately call the view template to render a view, and convert the view into HTML format and return it to the browser. Laravel advocates MVC mode, that is, model-view-controller. Therefore, programs written in Laravel should store different types of files in different directories according to its set directory structure. Every application is based on building a data model, which is based on the business logic of the application. As shown in Fig. 4, laravel uses the built-in Eloquent ORM component to build the data model code, and uses a database table to represent a piece of data. Laravel provides related technologies to simplify database access. Laravel connects the application data model and database tables by converting the table rows in the database into a way that allows operations to control PHP objects. This system can also execute business rules and describe the relationship between different data models in the application.

4 Function Realization

4.1 Student End

4.1.1 Learning Module

The students log into the learning module of the system, and the teaching of economic management can be divided into several sub-modules, namely, the public basic learning sub-module, the professional basic learning sub-module and the live video sub-module. The public learning sub-module is a theoretical course based on the basic courses of economic management majors, such as management, economics, basic accounting, macroeconomics, microeconomics, with the aim of enabling students to master the necessary basic theoretical knowledge. The curriculum schedule s realized by writing corresponding codes through Laravel framework, and the key code for designing the curriculum

```

public function store(Request $request){
    $exist = Schedule::where("class_id",Input::get('class_id'))->first();
    if($exist){ return Redirect::back()->withInput()->withErrors(ClassToGrade(Input::get(
(class_id))).' There is an existing curriculum schedule, which can only be modified, but cannot be
repeatedly created ');
        return false;}
    else{ for($i = 1;$i<=79;$i++){ $sd = 'd'.$i;
        if(!Input::get(sd) || Input::get($sd)==0 || Input::get(sd)=="") { }
        else{ $schedule = new Schedule;
            if($i>= 11 && $i<=15){ $schedule->section =1;
                $schedule->teacher_id = Input::get($sd);
            }else{ }
            $schedule->class_id = Input::get('class_id');
            $schedule->save(); } }return Redirect::back()->withInput()->withErrors(ClassToGrade(Input:
get('class_id').' Curriculum schedule created successfully '); } }

```

Fig. 5. Key code for creating curriculum schedule

is shown in the Fig. 5. The sub-module of basic practice focuses on strengthening students' professional skills and improving students' professional knowledge. The course is mainly aimed at various professional courses of economics and management major. For example, marketing can offer management practice, business negotiation practice, advertising planning practice and so on. The video sub-module invites the on-the-job employees of related enterprises to explain the current situation of the industry and the requirements for entry. Students can chat and interact with them online, ask about the skills and learning practice methods required by the industry, help students clarify their learning direction and establish a preliminary career plan.

4.1.2 Discussion Module

The original intention of this module design is to allow students to participate in the course discussion during the learning process of the teaching system, and to ask questions to teachers and share their learning experience. There are “Discovery”, “Topic” and “Help Center” in the homepage navigation of the discussion module. Students can choose to display the posts in chronological order, popular order, recommended order and order to be answered. You can choose to display all the posts or only the posts in a topic area. The topic area includes information section and professional communication section, in which the professional communication section is classified according to disciplines, and many sub-sections are refined. The students can exchange, learn and discuss in the corresponding posts.

4.2 Teacher End

The teacher's duty is to edit and upload the video courses and electronic courseware of the major of economic management. When editing the courses, we should pay attention to combining the course content with the practice of the actual industry, enrich the courseware content, and stimulate students' learning enthusiasm. It is also responsible


```
{
  "authHost": "http://xxx.xxx.cn",
  "authEndpoint": "/api/broadcasting/auth",
  "clients": [],
  "database": "redis",
  "databaseConfig": {
    "redis": {
      "port": "port",
      "host": "host",
      "db": "db",
      "password": "password"
    },
    "sqlite": {
      "databasePath": "/database/laravel-echo-server.sqlite"
    },
    "devMode": true,
    "host": null,
    "port": "6002",
    "protocol": "http",
    "socketio": {},
    "secureOptions": 67108864,
    "sslCertPath": "",
    "sslKeyPath": "",
    "sslCertChainPath": "",
    "sslPassphrase": "",
    "subscribers": {
      "http": true,
      "redis": true
    },
    "apiOriginAllow": {
      "allowCors": false,
      "allowOrigin": "",
      "allowMethods": "",
      "allowHeaders": ""
    }
  }
}
```

Fig. 6. Key code for realizing real-time message notification

for arranging on-the-job personnel engaged in related industries in enterprises to give live explanations to students, for example, inviting the department manager of a financial company to explain the development status and changing trend of the financial industry in recent years, and providing online career answers for students. Teachers also set up a discussion module for teachers, which provides convenience for increasing the distance between teachers and students. The system has a real-time message reminding function in order for teachers to receive students' messages in real time. As shown in Fig. 6 laravel-echo-server is the key code to realize real-time message notification.

5 Conclusions

From the perspective of “four new”, the design of digital network education platform for economic major based on web is to improve and optimize the teaching management mode and teaching methods of economic management major in colleges and universities, providing a good platform for teachers and students to interact with each other, and at the same time providing a practical guarantee for teaching quality. The Internet platform also provides a region for students to give full play to their own advantages, and enhances the ability of economic and management students in autonomous learning. The personalized design of teaching system from the perspective of Internet has advantages in improving teachers' teaching efficiency and perfection of teaching system. Teachers can better urge students to learn, and students can communicate with teachers in the system.

References

1. Zhou Haitao, Zheng Shuchao. The Optimization Path of “Four New” Discipline Construction [J]. E-education Research. 2022. 04
2. Guo Yuting. On The Reform of Teaching System of Economic Management Specialty under The New Situation [J]. Market Forum. 2020. 08
3. Yang Rixin. The Teaching Mode and Reform of Economic Management Specialty in the New Era [J]. China Management Informationization. 2021. 08
4. Zhu Qiang. Research on the Innovation of Teaching Management System and Teaching Mode of Economics Major [J]. Knowledge Economy. 2020. 03
5. Wang Chunteng, Xing Jieqing. Design and Implementation of Student Homework Peer Evaluation System Based on PHP [J]. Changjiang Information Communication. 2021. 11

6. Liu Lulu. Website Design and Implementation Based on PHP and MySQL [J]. Management & Technolosy of Sme. 2009. 10
7. Zhang Bo. The Design of Practical Teaching Management System in Higher Vocational Colleges Based on PHP+MySQL [J]. China Management Informationization. 2017. 08
8. Xu Weihong, Tu Wei. The Research of College Students' "Refined" Management Mechanism Based on Laravel Framework and the Practice of Platform Construction [J]. Science and Technology and Innovation. 2017. 08

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