



Design and Development of Auxiliary Teaching System for Preschool Education Major in Colleges and Universities Based on Spoc

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Abstract. Education is the foundation of the country. In order to further improve the quality of citizens and promote economic development, China has put forward more stringent requirements for national basic education. As the beginning of basic education, preschool education should adjust the current teaching mode with the help of the advantages of digital electronic technology. Based on this, this paper constructs an auxiliary teaching system of preschool education major in colleges and universities based on Spoc, and makes corresponding innovations in the teaching mode, teaching content and teaching methods of preschool education major. The overall development of the system is based on Windows10.0 operating system, Java is selected as the basic development environment, and Tomcat 8.0 is used as the Web server, which provides excellent page processing ability for the system. With the layered advantages of MVC, the contents of each part are deployed in layers, and MySQL database is used to store the system information, which not only expands the storage resources, but also increases the security of the system information, thus making the functions of the auxiliary teaching system more perfect.

Keywords: Spoc platform · preschool education · online teaching system · MVC · AHP analytic hierarchy process

1 Introduction

Education is the foundation of the country, and preschool education is particularly important in the whole education process. Children are the flowers of the motherland and the future of the country. Children's minds are not yet mature, and they are at the critical stage of their initial development. Schools should actively play the guiding role of education so that children's body and mind can develop in an all-round way [1]. However, due to the strong interdisciplinary nature of preschool education, the learning content involved is complicated, and a single classroom teaching model can no longer meet the learning needs of students, which leads to problems such as greater learning pressure and weak interest in learning. In view of this, this paper constructs an auxiliary teaching system

for preschool education majors in colleges and universities based on Spoc. Based on the learning content in offline teaching, the system extends the online course of the system, and gradually forms a complete online teaching auxiliary system from course learning to activity teaching to simulation training, which is more suitable for the learning habits of teachers and students. The design of training module also provides a new guarantee for teaching quality [2].

2 Key Technology Introduction

2.1 MVC

MVC is one of the programming modes in ASP.NET, and it is a special mode for creating Web applications. MVC layering helps to manage complicated program applications, and programmers can pay attention to one of them for a long time, and MVC layering can also focus on view design without relying on logical business, making it easier to test program applications. MVC can divide system components into three layers, namely view, model and controller [3].

2.2 Development Environment

According to the requirements of system development and the use of the above-mentioned key technologies, the configuration and deployment of the development environment of preschool education professional auxiliary teaching system in colleges and universities are completed. The overall development of the system is based on Windows10.0 operating system, with Java as the basic development environment, JDK version 1.6 and above, MyEclipse 2014 as the Java development environment, Tomcat 8.0 as the Web server and MySQL 5.5 as the database server. The overall construction steps of the system are as follows: First of all, complete the installation of JDK and the configuration of environment variables, which will be the development basis for the subsequent construction of Java applications. Secondly, MyEclipse and Tomcat are installed step by step, and Tomcat is initially configured in the Preference option in MyEclipse. Then, the Jar package Maven is configured in detail. Because of its special properties, it can be installed only by direct loading during the operation. Finally, the construction environment is tested simply, and after the test is correct, the subsequent operation of the preschool education professional auxiliary teaching system in colleges and universities can be carried out [4].

3 Functional Implementation

3.1 Course Center

In order to achieve the educational goal of “education for young children and excellent education for young children”, the system differentiates various functions in detail. When users use this system for the first time, they need to complete the registration according to the relevant guidance. After the registration, they need to choose a role to log in, and then they can use the corresponding functions of the system [5]. The system login code is shown below. In course center, courses are divided into two categories: professional foundation and activity design, and students can start self-study according to their needs.

```
<!doctype html>
<html lang="en">
  <head>
    <meta charset="UTF-8">
    <title>User Registration Page</title>
  </head>
  <body>
    <form action="signup.php" method="post">
      <p>user name:<input type="text" name="name"></p>
      <p>password:<input type="text" name="password"></p>
      <p><input type="submit" name="submit" value="enroll"></p>
    </form>
  </body>
</html>
```

Users can learn the basic knowledge of children's preschool education by clicking the professional basic module, such as Kindergarten Curriculum and Preschool Education Principles. The learning mode consists of video class, open class and exercise class. When watching the video course, the system strictly stipulates the study duration of students. If there is no operating system for a long time, the system will automatically determine that the user is disconnected and clear the study duration of this lesson [6]. In the open class module, the system has a special reminder function. After student users pay attention to an open class, the system will automatically remind them in the form of short messages when it starts, so as to avoid students missing it. After the open class, the administrator can browse the viewing data and other contents under the data analysis function, as shown in Table 1, which is the statistics table of live course data [7].

In the activity design module, student users can use the search function to check the cases of various teaching activities in kindergartens, such as the design and implementation of music education activities and preschool children's games [8]. Teachers can upload their own teaching cases to this module, and when uploading, they can choose keyword tags according to the teaching content, so that the system can classify and search with other users. The teaching case upload code is shown below.

Table 1. Data statistics table of open class browsing

No.	Opening time	Course theme	Number of viewers	Number of subscribers	Per capita viewing time
1	22.05.11	Preschool teachers' music skills	4437	8463	27.2min
2	22.06.07	Development psychology of preschool children	6745	6693	19.7min
3	22.07.15	Kindergarten class management	8857	10245	32.9min
4	22.07.23	Preschool teachers' oral English	6352	4781	22.31min

```
//Get the original name of the uploaded file
String filename = upload getOriginalFilename();
System. out. println("Upload file name: "+filename);
String suffixName = filename. substring(filename.lastIndexOf("."));
System. out. println("The suffix name of the truncation:" +suffixName);
//Generate the random file names
filename= =UUID. randomUUID0+suffixName;
//Create a file stream
File file=new File(filePath, filename);
try { //Start uploading files
    upload. transferTo(file);
} catch (IOException e) {
    e.printStackTrace();
```

3.2 Training Center

In order to further cultivate students' comprehensive practical ability, the online training system is specially set up as a tool for students' practice. On the home page, click the training system in the function guide bar, and then start the training operation after logging in. The system simulates the whole teaching environment of kindergarten, giving students the most authentic teaching experience. Training is divided into three stages: probation, follow-up internship and replacement-internship. At the beginning and end of the process, students need to report their personal data for later evaluation [9]. In the

Table 2. Evaluation of the overall operation of student users by AHP algorithm model

Target layer	Standard layer	Weighted value	Score	Final score
Training results score	Probation	$q_{11} = 0.036$	0.746	0.854
	Follow-up internship	$q_{21} = 0.031$	0.891	
	Replacement-internship	$q_{31} = 0.064$	1.306	
...

comprehensive evaluation of training, the system uses AHP algorithm model to evaluate the overall operation of student users step by step, as shown in Table 2. The formula for calculating the weight value of the training results is shown in Formula 1, where Q_{max} represents the weight value, O represents the hierarchy, and B sorts the weight vector [10].

$$Q_{max} = \sum_i^n \frac{(O \times B)_r}{n \cdot B_i} (i = 1) \tag{1}$$

4 Conclusion

With the continuous development of Internet technology, a single teaching model can no longer meet the needs of teachers and students. In this paper, the traditional teaching mode is innovated, and the auxiliary teaching system of preschool education major in colleges and universities is constructed with the help of technical advantages. The system makes use of the advantages of technology to incorporate video, audio, courseware and exercises into the teaching system, forming a surrounding integrated teaching, so that students’ comprehensive ability can be further improved.

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