Design of Computer-based Music Distance Education Learning System

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Abstract: With the rapid development of Internet technology, colleges and universities have designed a music distance teaching system with the help of computer. It is not only convenient for students to study actively, but also uses modern information technology and Internet technology to carry out teaching activities. Moreover, the network-based autonomous learning can provide more free space for students. Therefore, the design of music distance teaching system has very important practical significance. In this paper, the principle of system design and the structure and function of the system are analyzed comprehensively, and the practicability and feasibility of the system are proved by the practice of the system, so it is worth popularizing and applying.

1. Introduction
In modern society, computers have spread to various fields, and have shown great advantages in various aspects such as information storage, presentation, and computing. In order to further conform to the education reform and quality education concepts, we must break through the traditional teaching model, give full play to the role of teachers and students as the main body, build a new teaching model, and realize a huge change in education concepts and models. Influenced by the rapid development of computer networks, distance network education and learning has attracted much attention in the education field due to its rich teaching resources and diverse and flexible teaching methods. As a further expansion of the traditional teaching model, distance network teaching is bound to gradually developed into the main trend of future education.

2. Design guidelines for computer-based music distance education learning systems
2.1. scalability
The key to the design of computer-based distance education learning system lies in achieving the goal of music teaching in colleges and universities and laying a solid foundation for the subsequent expansion of the system. As for the continuity of the software and hardware of the system, the system should meet the relevant requirements of scalability and easy improvement and optimization to the greatest extent. Therefore, a sound and feasible system design is crucial to the development of the teaching system structure. In addition, the optimizable module and the stable module in the teaching system are separated, and the optimizable mode can be used for the later maintenance of the system, and the stable module is sealed.[1]
2.2. Practicality
The so-called practicability mainly includes the comprehensiveness of system functions and the practicability of the system itself. The ultimate purpose of the design of computer-based music distance education learning system is to promote the innovation and reform of music education in colleges and universities, but we cannot blindly pursue innovation and ignore the practicability and integrity of the system. And in order to ensure that the teaching system is fully functioning, it must be ensured that the system has characteristics such as easy control and application.

2.3. Security and stability
The design of computer-based music distance education learning system should also follow the principles of safety and stability. Only by ensuring that the system is sufficiently secure and reliable, can it be prevented from being attacked, thereby enabling the orderly and stable operation of the entire functional area, which is also an important prerequisite for the system to fully function. Therefore, in the design of the system, various adverse conditions should be fully considered to ensure the maximum flexibility and stability of the system.

3. Department of Computer-based Music Distance Education and Learning System design

3.1. Functional Model Design
The functional model is mainly designed based on the actual needs of teachers and students and can effectively reflect the system model. Use diversified forms to transform teacher and student needs into formal documentation.[2]

State diagram operations are the behaviors of teachers and students after they log in. They are a summary of all the system's behaviors. If they are divided in detail, they can be divided into multiple levels of operations.

4. Framework Design of Computer-based Music Distance Education Learning System

4.1. Framework Design
The computer-based music distance education learning system belongs to the B / S framework, which is different from the traditional model. It implements a comprehensive and simplified system development, maintenance, and use. You only need to install a browser on the client and enter the system URL in the address bar. You can use the system.
In the framework design, in order to meet the system scalability, to ensure that multiple users do not cause huge pressure on the server when accessing the system, a WEB server and a database server are used to undertake the corresponding work. First of all, the WEB server is the core server of the distance learning system.[3] Its task is to process user requests and access the DB server accordingly to exchange data with the database. It needs to complete all the business of the teaching system, which can prompt students to get a quick response and put the database Operation tasks are assigned to the DB server. Secondly, the role of the database server is to separate the data management and processing work from the core server, so as to improve the overall performance of the teaching system and facilitate the further expansion of the system.[4]

4.2. Framework analysis
The computer-based music distance education learning system is mainly designed based on the MVC model, including three layers: the presentation layer, the business layer, and the DAO layer. Among them, Struts is applied to the presentation layer. The task is to collect teacher and student requests, and process and interact with them accordingly. Based on the configuration, the business is redirected, and then the page is updated according to the file (Struts.XML) configuration. Spring is applied to the business layer, and its role is to generate management classes. When classes are needed, it only needs to be reasonably configured in applicationcontext.XML, so that the functional code coupling between programs is reduced, and it is easy to debug and maintain. Hi-bernate database is applied to the processing layer. All its tables need to be associated with JavaBeans based on the corresponding files, and then the data table operations are implemented through its operations.

4.3. Framework execution
Based on the system frame, according to the actual situation, the system frame processing flow is obtained.

In the system processing framework flow, the presentation layer uses JSP to compile and display the page to the user to achieve interaction. When the user makes a request, based on the JSP display, Struts performs class processing on the request according to the file configuration. In the business layer, Spring's task is to provide business model components for Actions to perform unified processing of things. [5]

Based on the hbm.XML file to realize the automatic mapping of the database and JavaBeans, prompt users to use JavaBeans to operate the database, and feed back the results to the business layer, and then process back to the control layer, and finally receive the response through the JSP page.

5. System implementation
The computer-based music distance education and learning system is an application program based on the Internet. The B / S mode is selected. The application server is set to provide users with high-quality services. The browser can be accessed by installing a browser on the client. The implementation of the system uses the layered concept of the J2EE project to divide the system into a database persistence layer, a service layer, and an interface layer. According to this function, different modules are divided. All module implementations are implemented using interface-oriented programming. The three-layer framework separated by the MVC code. After the introduction of the SHH framework, the two are divided in contrast. Hibernate is the model layer. Its task is to generate data table objects and realize their association with the tables. The data tables are operated by manipulating JavaBeans. Struts is the control layer, and the task is based on the JSP organically linked data layer and view layer, receiving requests, and processing, sending, and controlling the specific trend of the system's operating process. Spring's task is to manage Hibernate and Struts, generate the required classes for both, and reduce code coupling.
6. Conclusion
In a word, the design of computer-based music distance education learning system directly breaks the traditional single teaching mode of music courses, provides students with rich images and interactive learning interfaces, and fully motivates students' learning. Students can not only listen to the teacher's explanation of music based on this system, but also actively seek and listen to music through various sensory stimuli to acquire music knowledge, stimulate students' thirst for music knowledge, and promote students to experience, appreciate and create music independently, lay a solid foundation for diversified ways of music learning. This system has proved the practicability and feasibility of this system through system design and practice, so it is worth promoting vigorously.

References
[1] Liu Qingtang, Ao Huanhuan, Li Hao. (2014) Design and Implementation of Music Singing System Based on Feature Comparison [J]. Computer Engineering and Design, (7): 2592-2597.
[2] Jin Xiaoran. (2016) Design and implementation of mobile terminal learning system for distance education based on Android [D]. Shanghai: East China University of Science and Technology.
[3] Ye Qing.(2018) Design and Implementation of Web-based Distance Teaching System [J]. Automation and Instrumentation, (10): 228-230.
[4] Jiang Jiang. (2016) Design and implementation of real-time interactive distance education system based on android platform [J]. Information Communication, (4): 121-122.
[5] Tan Haihong, He Fang. (2015) Design and implementation of Android-based remote monitoring system [J]. Modular Machine Tool and Automatic Manufacturing Technology, (7): 61-63.