



Function Design of Music Online Education Network Virtual Classroom Platform

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Abstract. Music online education network virtual classroom platform has diversified theoretical basis, emphasizing open development and interaction between teachers and students. The music teaching videos spread on the Internet spread the music teaching resources to the outside, which has the characteristics of open, extensible, flexible and quasi permanent separation of distance teaching. According to the theories of education system cybernetics and constructivism, this paper puts forward the function of music online education network virtual classroom platform by using the methods of literature analysis and case study. This paper answers how to build a music micro class distance education platform, expounds the conditions to realize the music education platform, and analyzes the obstacles and Countermeasures to realize the music education platform.

Keywords: Music education · Online education · Virtual classroom · Platform function

1 Introduction

As an important aspect of quality education in higher education, music appreciation has also been included in the curriculum of humanistic quality education in many colleges and universities. As a kind of culture, music has a long history and a vast horizon [1]. It has an extremely important effect on the quality of talents. Through the process of music appreciation, we can improve the ability of image thinking and abstract thinking, promote the balanced development of the brain, improve the ability of memory and coordination, and stimulate creative emotions. However, how to make students grasp the profound connotation of music and improve their appreciation of music art in a short time has always been a problem that the music education circles strive to solve, and the key to solve the problem is targeted education for students [2]. Among them, the collection and collation of music appreciation materials has become particularly important. Therefore, the design and development of an online music education platform to meet the needs of art college is an effective way to promote students' music education [3].

With the rapid development of network education in China, distance education based on network, as a new form of education, has become one of the hot issues in distance education. Literature [4] uses the theory of collaborative work (CSCW) to virtual the

teaching function of traditional classroom and provide a sharing and cooperative classroom learning environment for online teachers and students who are geographically dispersed. Literature [5] proposed a functional design method of network virtual classroom platform. Using the remote virtual classroom system which combines physical classroom and virtual classroom, this paper analyzes and studies the system from the aspects of technicality and practicability, and discusses how to improve the interaction and effectiveness of distance education under the system environment.

Although network education has made a lot of achievements and experience, there are also many unsatisfactory aspects, mainly reflected in the following two aspects: First, the importance of distance learning platform is not fully understood. The traditional concept often only attaches importance to the development of a single network course or network courseware, and ignores the role of information-based teaching platform. As a mature network teaching platform, it should have the important functions of network course development, teaching implementation, network teaching management and student learning support services. Second, the teaching mode is single and lacks support for teaching activities. At present, the common problem of network teaching is that it pays more attention to the presentation and explanation of teaching content than the design of teaching environment and teaching activities, especially the lack of efficient design of teaching interactive activities and single form of teaching content. One of the most prominent contradictions is that the network teaching using new teaching technology still uses the old teaching ideas and teaching methods, leading to the network teaching does not play its due efficiency and potential.

2 Summary

According to the current situation of network teaching, this paper designs and develops a multi-functional network teaching platform based on three modes, specifically from the following aspects. First of all, this paper analyzes the current common network teaching mode from the theoretical point of view, synthesizes its advantages, disadvantages and scope of application, and puts forward the design idea of combining the teacher led teaching mode, autonomous learning mode and problem-based inquiry mode, and applying them together on the network teaching platform, so as to make it the guiding theory of the teaching platform; Secondly, design and construct a network teaching platform based on the above three teaching modes. The platform has three user roles, three teaching modes, six functional modules and several sub functions of corresponding roles. The framework involves curriculum development, teaching implementation and teaching management; Finally, using ASP + SQL Server, a specific network teaching platform is developed, and its teaching effect is verified.

3 Integration of Teaching Mode

At present, there are many commonly used teaching modes in the network environment, including teaching mode, individual counseling mode, exploratory learning mode, collaborative learning mode, discussion network teaching mode, etc. Most of them come from the traditional teaching mode and combine with the modern network technology.

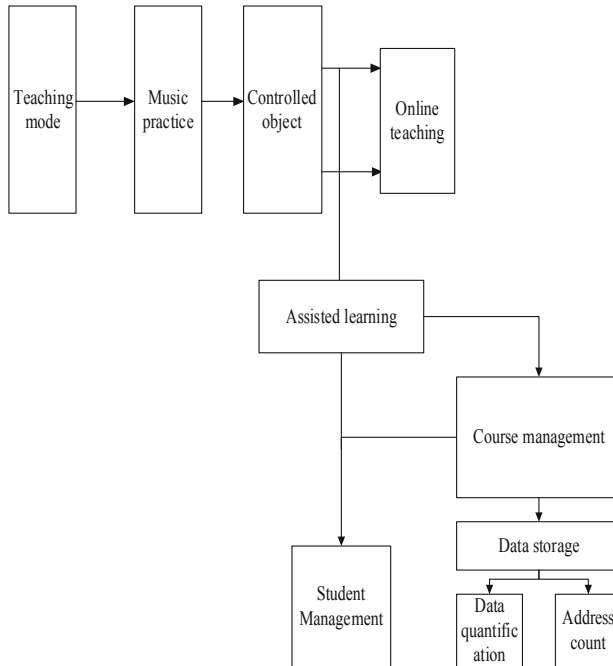


Fig. 1. Framework of music online education network virtual classroom platform

They not only have the advantages of the traditional mode, but also have the characteristics of information teaching to a certain extent. With the intervention of network multimedia technology, it provides us with more personalized choices and richer teaching methods. Although there are many kinds of network teaching modes in common use at present, according to the different dominant position and emphasis of teachers and students in the teaching process, the network teaching modes are divided into three categories: There are three teaching modes: teacher led mode, students' autonomous learning mode and inquiry teaching mode. These three models comprehensively summarize most of the characteristics and advantages of common models, and integrate them to meet the needs of learners with different levels and backgrounds. The teacher led mode is a teaching mode based on teacher's lecture, which is the transformation of the traditional transmission acceptance mode (Fig. 1).

This mode emphasizes the leading role of teachers. It mainly stores the prepared teaching materials on the server on the platform, and presents the teaching content in a certain order according to the organization form of online courses. It has the advantages of carrying large amount of information and relatively flexible learning time; its disadvantages are poor interaction and lack of personality guidance [6].

Resource based autonomous learning mode refers to the learning support service system provided by students in the network environment, which can learn actively, independently and exploratively. This model reflects the cognitive and emotional characteristics of students' learning, such as subjectivity, initiative, support and strategy. In the whole cognitive process, the teacher's main role is to effectively organize and guide students' autonomous learning, and timely evaluate whether students complete the learning

task. So as to promote students to acquire new knowledge through their own learning, and in the process of learning new knowledge timely “internalize” knowledge, form and develop learning ability, and finally achieve the coordinated development of knowledge and ability [7, 8].

The integrated teaching mode is shown in Fig. 2.

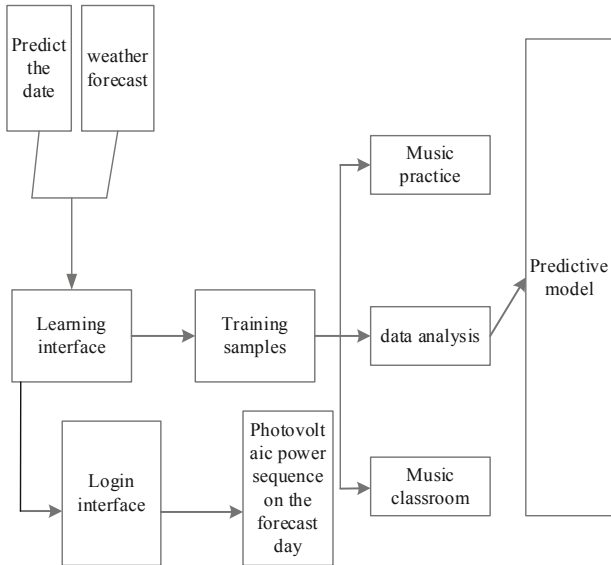


Fig. 2. Integrated teaching mode

The problem-based inquiry mode is a learning mode that learners solve the problems through mutual cooperation, learn the scientific knowledge hidden behind the problems, promote learners to form critical thinking, acquire the skills of autonomous learning and collaborative learning, and effectively solve problems. Its main characteristics are problem-based, learner centered, group based and teacher-oriented. Its purpose is to cultivate learners’ ability to solve problems, master knowledge flexibly, develop self-study ability and lifelong learning ability.

4 The Framework of Multifunctional Teaching Platform

Based on three main teaching modes, a comprehensive teaching platform with multiple user roles, multiple teaching modes, and multiple functions is designed and constructed, which integrates the functions of curriculum development, teaching implementation and teaching management. The role of the platform includes administrator, teacher and student. Administrators have the authority to manage courses and users, teachers have the authority to manage teaching content, students can use a variety of learning modes to learn. In general, according to different types of functions, the platform is divided into six modules, which are user management module, course teaching management and

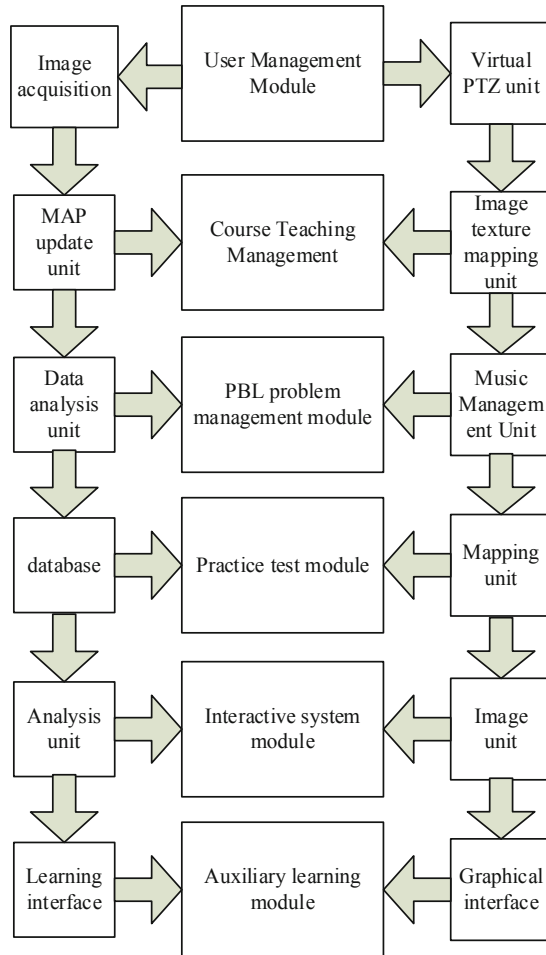


Fig. 3. Multi function teaching platform module

PBL problem management module, practice test module, interactive system module, auxiliary learning module and monitoring and evaluation module.

According to Fig. 3, each module is divided into two parts foreground and background. The background is mainly designed for administrators and teachers, providing functions including curriculum management and curriculum development. The front desk serves students and provides various learning mode interfaces. Two problems can be illustrated in the figure. One is that the online course is a modular organizational structure, each module has functions designed for each different role, and the module has permission control inside; Second, the network course is organized in the form of modules, which is extensible. If you want to add other functions, you don't need to change other modules, just need to replace or modify, and don't affect the functions of other modules [9].

In the structure of the network teaching platform, the course teaching management and PBL discussion module are the core contents of the whole platform, which realizes the three teaching modes mentioned above. In the design of this module, for different teaching modes, teachers or administrators can make and manage various types of teaching content in the background, and students can choose any learning method according to their needs. The construction of this platform greatly facilitates the network teaching of students and teachers [10].

When teachers enter the management system, they should first choose a course as the object of management. In the autonomous learning mode, teachers can create courses and add, modify and delete chapters, sections and knowledge points. In the presentation mode, according to the organization form of network courses (courseware), teachers store the multimedia lectures prepared in advance on the web server in a certain order [11, 12]. For PBL discussion mode, teachers can add, delete and modify all the problems that need to be discussed, and associate the knowledge points related to the problem in the process of adding PBL problems. In this way, students can also refer to relevant knowledge points when they discuss. When students enter the front desk learning system, they first choose the course to be learned, and then choose the corresponding learning mode according to the different teaching contents and their own preferences. The process is shown in Fig. 4.

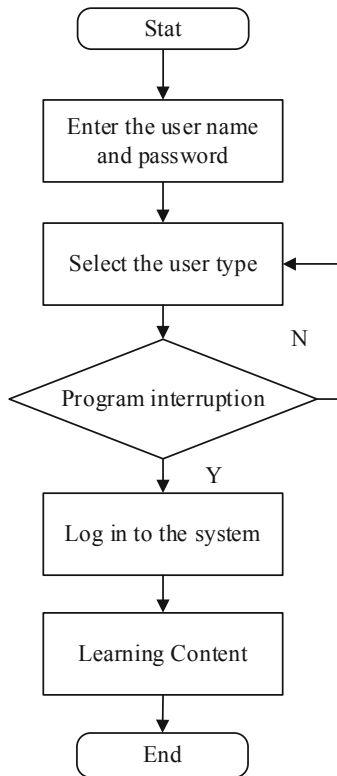


Fig. 4. Management process

5 Implementation Technology of Network Teaching Platform

The platform uses ASP + SQL Serve: as the implementation tool and windows IIS as the server environment. The platform has the following characteristics in technical implementation: using MDS encryption technology, the user password is stored in the database by fixed length encryption to ensure the security of the system; Through the relationship between SQL Server tables, entity integrity is automatically maintained to ensure that there is no redundant data in the database; The stored procedure and trigger function of SQL SERVE are widely used to improve the system performance; Modularize the functions of paging and database connection to maximize the reusability of the program [13, 14].

This paper summarizes and extracts three representative teaching modes from the common network teaching modes, optimizes and combines them, designs a network teaching platform with multiple functions, and develops a set of practical and effective network teaching platform under the guidance of the design idea.

In order to design and develop an online music education platform to meet the needs of music teachers and students in art college, we must first study the basic principles of music on demand system. At present, general music-on-demand systems adopt a system three-tier structure model, that is, a three-tier structure model of Browser, Application Server, and Database Server. In the music on demand system, the client can use the ordinary PC to operate, as long as the installation of IE browser, the client video player can install related plug-ins for online music appreciation. At present, the traditional Client/Server two-tier application development mode has been gradually replaced by the three-tier application development mode. The three-tier development mode is the most popular development mode at present, which has superior manageability and maintainability. This development method minimizes the application of the client to only need a web browser, so as to reduce the amount of maintenance, reduce the difficulty of program modification and upgrade, and reduce the hardware and software requirements of the client. In the development of Web application system based on Internet, the three-tier architecture mode has been very common at home and abroad, and the development technology and design ideas used in the implementation of VOD system are becoming more and more mature and advanced. In the current web application, this three-tier architecture mode is still the main mode of computer application information system based on network [15].

The basic framework of the education platform is shown in Fig. 5:

Among them, on the server side, there is a large capacity storage device used to store audio and video resources or compressed audio and video resources. In addition, there are some audio and video coding equipment, publishing and management unit and other related streaming media control unit. The compression and format conversion of original audio and video resources or other multimedia resources or animations are mainly completed by encoding devices. The publishing unit is mainly to provide a list or list of programs to the user terminal, mainly in the form of a web interface, and the user performs on-demand operations by clicking the program name. The user management, program management, user authentication, timing and billing are handled by the program management unit. The on-demand control of streaming media is mainly realized by the

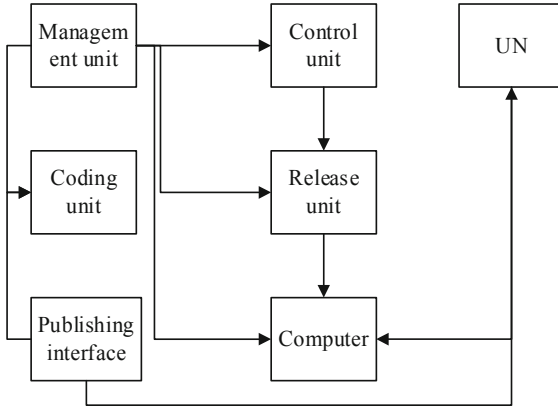


Fig. 5. Basic framework of education platform

streaming media control unit, which also includes the core work of system concurrency control.

6 Test the Effect of Platform Function Realization

The application performance and ability of virtual classroom functional platforms of different platforms were tested through information recall rate, and the results were shown in Fig. 6.

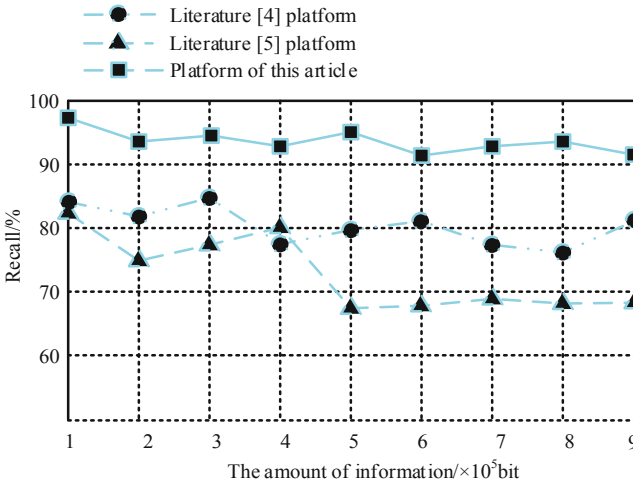


Fig. 6. Comparison of virtual classroom information recall rates on different platforms

As can be seen from Fig. 6, with the increase of information in virtual classroom, information recall rates of different platforms are also changing constantly. Only when

the amount of information is 4×10^5 , the information recall rate of the literature platform [4] is higher than that of the literature platform [5], and the lowest information recall rate of the literature platform [5] is below 70%. However, the information recall rate of the platform in this paper is always higher than 92%, indicating that the recall effect of the platform in this paper is obvious because of the two comparison platforms.

7 Function of Music Online Education Network Virtual Classroom Platform

In the functional design of this platform, there is a user registration module. Only registered and audited users or students imported by the college management can log in to this system. Legitimate users who log in to the system can use all the resources on the system to search for music, listen online and download songs. The basic function modules of the system include: music online browsing and appreciation module, music search module, music recommendation and collection module, music review module, user information management module, music masters, album management module, information release module, music download management module, etc. The overall functional structure is shown in Fig. 7.

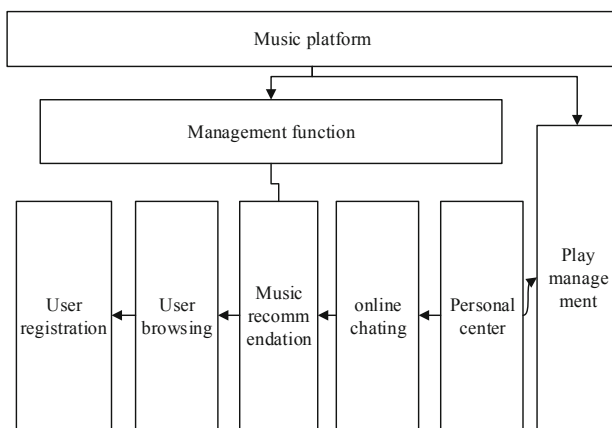


Fig. 7. General function structure diagram

7.1 Main Functions of Front Desk

The main function modules and basic function flow of the front desk are shown in Fig. 8. After students register and become legal users, they can enjoy music online, download songs, search songs, collect songs, recommend, share and exchange music appreciation experience with other users or teachers.

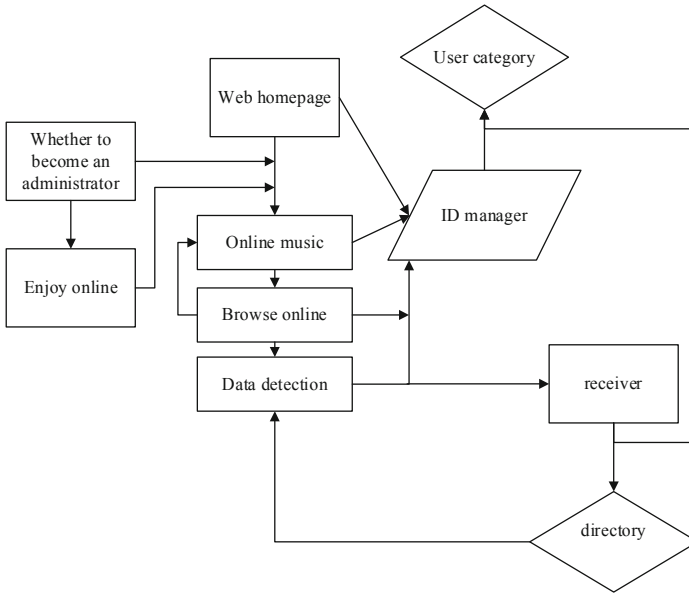


Fig. 8. Main function modules of front desk

7.2 User Login Module

The design of user login function is similar to that of other web systems. Registered and approved users or students can log in to the system through the existing user name and password. Users need to choose the user identity when they log in, such as teachers, students or administrators. The system will check the background database. If the user is a legal user, it will be guided to jump to the operation page of relevant authority. For example, after a student enters the correct user name and password, the system will assign a successful login information to the user, and the user page will jump to the “online audition” main interface.

7.3 Website Search Module

Search is designed for users to quickly find or locate music resources. With the search function, users can find the music resources they need in the massive music library. The search function is generally designed in the appropriate position of the system home page. After students or teachers log in, they can not only browse music resources by category, but also use the search function to search music. There are many kinds of search criteria for the search function, including search by song name, search by famous musician name, search by album name, etc. In the actual operation, users only need to choose a suitable search method, they can quickly query, and the query results will be displayed on the corresponding page.

7.4 Online Appreciation Module

After users log in to the system, they can choose the right songs to enjoy, and at the same time, they can evaluate, share and recommend the songs.

7.5 Main Functions of Background

In addition to the rights of ordinary members, administrators can also manage songs, albums and users. When adding new music, they can upload files, modify login accounts and passwords, and log off.

The main functions of the module include: music information management, celebrity management, music classification management, song management (including music upload, delete, update, etc.), user management, comment management, etc. After the administrator logs in as an administrator and passes the verification, the system will enter the interface of relevant operation authority and enter the management home page. The basic function flow is shown in Fig. 9.

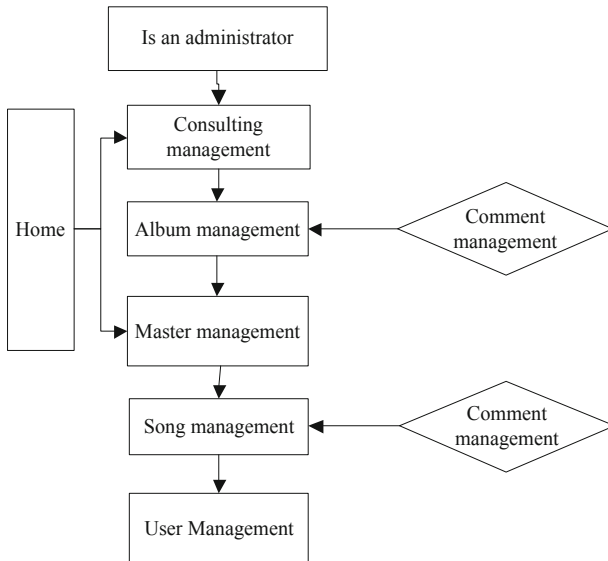


Fig. 9. Main function flow chart of background

8 Conclusion

According to the rapid development of domestic music and the lack of education platform, this paper takes the music virtual classroom as an example to put forward the design scheme of virtual education platform, and discusses in detail the production and collection of music micro class, the classification, arrangement and release of music

education, and the remote management of music education platform. The hardware and software, team cooperation and other conditions needed to realize the design scheme are demonstrated, especially how to solve the problems of shortage of funds, technical difficulties, waste of teaching resources and so on. Music platform can be used as an integral part of the National University micro course platform to provide a method and a way of thinking for building a comprehensive education platform. When looking forward to the future development trend of music education and even the whole education, we need to consider it in a distance education environment. The integrable ware combination platform based on Web browser may become the mainstream direction of the development of educational software platform. Integrable ware has an important impact on the development of education, and education can be regarded as an integral part of integrable ware.

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