Cultural Heritage Network Courses in the Information Environment

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Abstract. With the continuous penetration and integration of the Internet in the field of education, the availability of educational resources has been continuously improved, which has provided strong support for strengthening the construction of educational system resources. In the stage of rapid development of Internet technology, the coverage of wireless networks has continued to increase, and a large number of new Internet products have been born, which has provided a good boost for the networked development of educational products, and thus derived the Internet + education network online learning model. Cultural heritage is an important accumulation and basic source of contemporary cultural development and innovation in our country. In order to inherit cultural heritage and develop cultural undertakings, this paper has launched a cultural heritage online course learning system based on a Web platform. Any group who wants to understand national culture can enter platform for learning. With the support of information technology such as Web server and the Internet, the online courses of cultural heritage are developed, which can track students' learning records, and teachers can send students' learning information through text messages. Through the evaluation of the cultural heritage online curriculum design, some deficiencies in the curriculum design can be improved, and the curriculum design content such as cultural heritage teaching resources and teaching objectives can be more in line with the actual teaching.

Keywords: Information Technology · Cultural Heritage · Online Course Design · Web Platform

1 Introduction

The development of the Internet and information technology has changed the way people learn. The rapid economic development has also accelerated the pace of cultural progress, but due to the increasing abundance of modern culture and the continuous strengthening of its influence, it has caused a huge impact on the spread of national culture. Therefore, it is necessary to use modern technology to build a cultural heritage protection mechanism and scientifically manage national culture, so that cultural heritage can also be effectively guaranteed in the information environment.

So far, many scholars have carried out research on the design and development of online courses for cultural heritage in the information environment, and have achieved

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extraordinary results. For example, Blackboard, WebCT, Moodle and Sky Classroom are the most widely used environments for online teaching. Some scholars use the Moodle platform to develop English online courses, and students can learn interactively through this platform [1]. Taking quasi-physical education in this province as an example, a scholar explores the inheritance status and problems of quasi-sports culture in physical education in primary and secondary schools, and believes that the setting of educational goals, changes in teaching methods, compilation of textbooks, development of school-based courses, and strengthening of cooperation inside and outside the school should be carried out. In order to promote the inheritance effect of sports cultural heritage in school physical education [2]. Some researchers have integrated the costume features and cultural features of ethnic minorities, and digitized them with the help of computer technology, and then promoted the ethnic culture through the platform, popularized the ethnic cultural characteristics to the general public, and made the heritage culture into the field of vision of more people [3]. Some scholars take advantage of UML to design a network platform for the digital inheritance and protection of minority culture through object-oriented design methods in software engineering [4]. Although many scholars have used a lot of modern information technology in the development of cultural heritage online courses, the cultural heritage online courses still need to strengthen the curriculum design form and collect more cultural heritage resources in order to attract students to learn national culture.

This paper first introduces the concept of online courses, and then analyzes the design process of cultural heritage online courses. Then build a cultural heritage network course system based on Web platform, and support students and teachers to learn and teach network courses through Web server. Finally, the online course design of cultural heritage in the platform is evaluated through the evaluation of teachers and students, and the content of course design is optimized.

2 Cultural Heritage Online Course

2.1 Online Courses

Online courses are a new type of courses produced with the development of distance education. The main features are network, interactive, and synchronous learning and asynchronous learning. Therefore, higher requirements are placed on the autonomy of learners. Without the guidance of traditional classroom teachers, learners can set their own learning pace according to their own learning styles, participate in various learning activities according to specific learning goals, and finally complete learning tasks [5, 6].

2.2 Cultural Heritage Online Course Design Process

2.2.1 Identify Teaching Objects and Goals

In the process of designing the teaching process of online courses, it is necessary to first determine the teaching objects and teaching objectives, formulate a cultural communication plan according to the characteristics of the national culture, and use a variety

of communication methods to convey cultural ideas to users. Teaching can also gradually arouse users' interest in national culture, so as to obtain better teaching effect [7]. The cultural heritage curriculum platform based on the network information environment should carry forward, inherit and develop national culture. Therefore, most of the courses are designed to attract users' attention through ethnic cultural pictures, videos, etc., and interactive programs are set up for flexible teaching. The development of this cultural heritage course has a wide range of users, so the course arrangement of the entire cultural resources online learning will not be too difficult and complicated. The goal of this course is to display cultural heritage information, so that ethnic culture lovers can learn Heritage culture so as to increase the spread and inheritance of the entire heritage culture [8, 9].

2.2.2 Clarify the Teaching Mode and Highlight the Teaching Characteristics

In the process of online course teaching, it is necessary to establish a unique teaching style such as cultural learning methods, provide personalized courses according to the needs of different users, and understand a variety of ethnic cultures, so that users can learn in a relaxed environment and achieve teaching purposes. Online course teaching must have multiple functions. In addition to basic text display, it is best to set some animation, sound effects, small video and other functions through information technology [10].

2.2.3 Teaching System Structure and Module Design

In the process of carrying out online course teaching, special teaching modules should be established according to the learning styles of different students. The contents of the modules are inherited and echo each other. In this way, a learning system is created, which provides students with a variety of learning experiences and improves their comprehensive learning ability [11]. Therefore, the design of the cultural heritage online course can determine multiple teaching modules, and the modules are related to each other, so as to master and learn the teaching content of the online course one by one.

2.2.4 Integrate Material Information

Create a material web page, on which students can search for the course resources they need to find based on keywords. For example, according to the unique characteristics of a certain ethnic group's cultural costumes, they can search for the text introduction, picture display, and historical sources of this type of costume. Wait. A jump function can also be set on the webpage, that is, students can jump to the corresponding material by clicking on the relevant picture or video, which is convenient for students to find relevant cultural heritage information and knowledge, realizes the effective integration of teaching resources, and effectively solves the problem of collecting materials. In the process of data, due to no purpose and no strategy, the quality of the material is affected [12].

2.3 Scoring Feature Extraction

This article evaluates the design of the cultural heritage online course and adopts a scoring system. The scoring method is that each user performs scoring feature extraction on the satisfaction of the online course design according to their own scoring standards.

$$M = \frac{\sum_{k=1}^{n} ru(k)}{n} \tag{1}$$

$$P = \{p_1, p_2, ..., p_n\} \tag{2}$$

Among them, M is a new feature, P represents the set of items evaluated by user u, n is the total number of items evaluated by the user, ru(k) represents the user's rating on item k, and $k \in P$.

3 Design of Cultural Heritage Online Course System Based on Web Platform

3.1 Online Course Development Platform - Web Platform

The Web server includes various components, and its main task is to create a friendly human-machine interface, so that users can enter the platform and form a good interactive mode with the platform. Web server plays a very important role in system design, and its popularity is gradually expanding. It is an important consideration in application design. Web frameworks have their own particularities, so this is a quick and easy framework to use when designing web courses.

3.2 Design of Cultural Heritage Resource Library

In order to better digitally protect and disseminate national cultural heritage in the information age, this paper establishes a cultural heritage resource database. The cultural resources included in the database mainly include national costumes, customs, songs and dances, transportation, food, housing and other cultures and resources. The presentation forms include pictures, text, video, and audio.

3.3 Support Services Architecture

3.3.1 Student Support Services Module

Due to the rich resources of this online course, in addition to the text chapters, there are many extracurricular tutoring resources. In order to enable students to enter the learning state after logging in to the online course, and not spend time on aimless web browsing because they can't find the learning focus, the course learning guidance is provided to the students. The prompt of the course guide is "according to the system setting time, the current learning scope is: which chapters, specific chapter titles, please pay attention to arrange your learning progress reasonably", which appears on the homepage of the course. Part of the content of the guidance prompt, "which chapters, the specific chapter titles" changes automatically with time, and the change is based on the course schedule, which is arranged by the teacher at the beginning of each semester. The specific initialization is done by the system administrator.

3.3.2 Teacher Support Module

Due to the different time and asynchronous characteristics of online teaching, it is impossible to meet the needs of students by displaying important notices or teaching guidance only through web pages. Mobile learning just provides us with a new way of thinking. Timely and effective push to students, in order to provide good support for students' online learning. Considering the large number of students, it is impossible for teachers to send text messages through mobile phones one by one. In order to solve this kind of problem, this support service has designed a mode of sending text messages through the course platform, that is, in the online course, use the computer keyboard to input the content of notifications or teaching guidance, and use the Select the object to receive the message with the mouse, and click the Send button to complete the message sending.

4 Learning Research and Experimentation

4.1 Cultural Heritage Online Course Resources

Data mining has always been a research hotspot of scholars. Data mining technology is to mine hidden information from massive information. Data mining can be applied to decision support systems to provide support for user decision-making. In this paper, data mining technology is used for cultural heritage resource mining. Fuzzy theory is a common form of data mining. The Gaussian triangular membership function in the membership function of fuzzy theory is as follows:

$$u(x)\begin{cases} 1-\frac{|x-w|}{\varepsilon}, |x-w| \le \varepsilon \\ 0, |x-w| > \varepsilon \end{cases} \tag{3}$$

Among them, w and ε are the center and width of the fuzzy set, respectively, and u(x) represents the membership function.

$$v(x) = \exp\left(-\frac{(x-y)^2}{l^2}\right) \tag{4}$$

where y and l represent the center and width of the fuzzy set, and v(x) represents the Gaussian triangular membership function.

The cultural heritage resource library plays a central role in resource sharing, providing users with various ethnic cultural resources for users to use and learn. The cultural heritage resource library includes three contents, as shown in Fig. 1.

Cultural Browsing and Keyword Retrieval: As a portal website, the main function of Cultural Resource Bank is to provide search and retrieval pages. Users can find a lot of cultural heritage resource information by entering cultural heritage keywords on the course platform. This operation is also very simple. It is affected by the situation that we usually use the search bar. There is no technical level, and it is supported by information technology and network. The search efficiency is very high.

Thematic display: Different cultural learning topics can be made for very special cultural elements, cultural origins or story backgrounds in national culture to guide

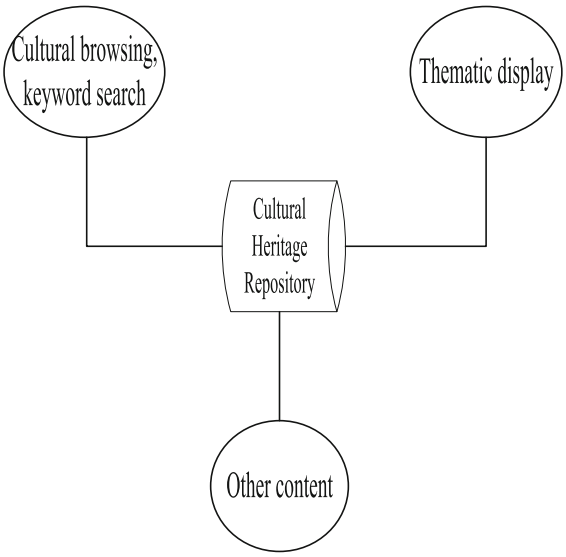

Fig. 1. The use of information technology for teachers

learners to learn better. For example, as the most characteristic symbol of each ethnic group, clothing is displayed on the portal website in the form of clothing culture topics.

Other content: Considering the validity and sufficiency of the data in the repository, in addition to providing portal services, it is also necessary to provide system introduction, system dynamics and other related systems.

4.2 Cultural Heritage Online Course Assessment

The last link in the design of the teaching mode of the online course of cultural heritage based on the Web platform is evaluation. Through assessment, feedback can be used to modify specific teaching links.

Take teacher self-assessment as an example. Teachers' self-evaluation method evaluates the "excellent" standard content in five aspects: curriculum design, curriculum resources, curriculum interaction, curriculum interface and curriculum evaluation. Teachers will judge and score according to the content of their own curriculum design. Excellent is 5 points, good is 3–4 points, and medium is 1–2 points. In the process of self-assessment, teachers can discover the areas that need improvement in the above five areas, so as to revise and improve the curriculum as soon as possible. A questionnaire was given to 30 teachers who participated in the design of the cultural heritage online course for course self-evaluation. The evaluation results are shown in Table 1. From the results in the figure, it is not difficult to see that the design of course interaction and course interface needs to be strengthened.

Take student evaluations as an example. A questionnaire was sent to 30 online learners who participated in cultural heritage learning, and they gave feedback on the course design stage, course development stage and course implementation stage respectively.

Table 1. Teacher self-assessment results

	5	3–4	1–2
Course Design	12	14	4
Course Resources	24	3	3
Course interaction	6	19	5
Course interface	5	21	4
Course evaluation	10	17	3

If the proportion of excellent is more than 70%, it can be defaulted as no modification, otherwise, the modification of this part needs to be considered. The evaluation results of the course design stage are shown in Fig. 2.

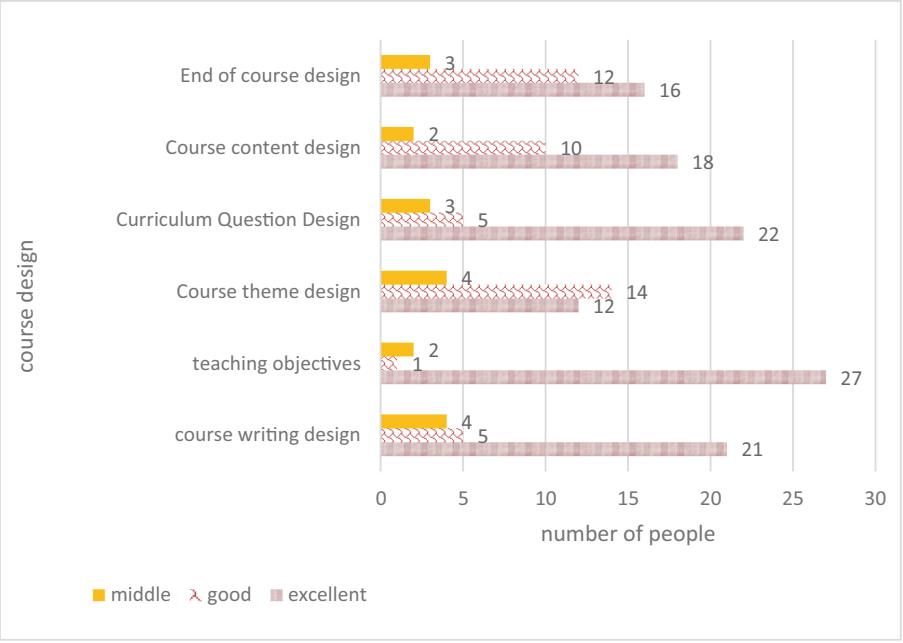

Fig. 2. Student evaluation results

Analyzing the results in Fig. 2, it is not difficult to find that the student users are not satisfied with the theme design of the cultural heritage course, but other aspects are acceptable evaluations. Therefore, according to the feedback information, the designer needs to revise the cultural heritage theme design part.

5 Conclusion

This paper uses the Web development platform to design the cultural heritage online course, and hopes to contribute to the modern inheritance, protection and innovative development of cultural heritage by promoting the cultural heritage online course to the majority of users. In the process of designing cultural heritage online courses, we investigated the evaluation results of students and teachers on curriculum design, and found that when designing cultural heritage online courses, the design of course interaction, course interface and course theme still needs to be optimized.

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