International Journal of Engineering Inventions
e-ISSN: 2278-7461, p-ISSN: 2319-6491
Volume 7, Issue 9 [September 2018] PP: 01-04

Correspondence System of Overseas Chinese Education based on Internet Structure

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ABSTRACT*: We introduce a distant teaching system of overseas Chinese education based on the current Internet structure. This system is designed according to the characteristics of distant overseas Chinese teaching and the fact that teachers can not be always abroad. Under the current Internet environment, we make proper use of the modern multimedia technology and the network method, realizing the rational integration of video, audio and PC images of teachers' teaching. We put forward a shared scheme that recording, editing and broadcasting of courseware. In this way, we have made the share use of the education resource and the overseas Chinese teaching information-based.*

KEYWORDS*: distant overseas Chinese education; stream-media file; multi-stream integration*

Date of Submission: 18-10-2018 Date of acceptance:04-11-2018

I. DISTANT EDUCATION AND DISTANT OVERSEAS CHINESE EDUCATION

In the traditional ordinary classroom, there are totally three elements existing in the same space, which are teachers, students and education content. Distant education is different in the way that the three elements still exist, but are not in the same space or at the same time. In the ordinary education, the media is not particularly important, and teaching can also be carried on without using some relatively advanced educational technology and media means. However, in distant education, in addition to the former three elements, there exists the fourth element, namely, educational media. If there is no educational media, there is no distant education. In the case of relatively isolation of teachers and students, educational media becomes especially important[1].

The general forms of distant education: using various transmission media such as wired or wireless broadcast, TV or satellite TV to transmit education information; using the information-storing media to organize teaching, like printed materials, audio and video materials and cyber-multimedia teaching materials, etc.

Distant overseas Chinese education is a branch of distant teaching, and its teaching place is basically in the overseas with young ethnic Chinese overseas as its teaching object mostly[2]. In addition to the teaching forms of distant education mentioned before, distant overseas Chinese education also includes local real-time recording and broadcasting, then generating multimedia teaching courseware or on-demand standing remote service by making use of multimedia technology such as modern Internet.

The implementation of distant overseas Chinese education is inseparable from the support of multimedia technology. The current higher school in the distant overseas Chinese education introduce teaching methods mostly based on text and graphics. With the increasing demand on distant overseas Chinese education and teaching, and the improvement of function of PC, we now need some courseware such as one which is more objective and realistic and rich in content, and combining videos and audios, in order to meet the requirements of students' learning on demand anywhere, anytime. The distant teaching system of overseas Chinese education based on Internet designed by us has basically met this demand. Not only has this system met the demand of teaching on videos, audios and screen flow, but also it has provided solutions to real-time recording and on-demand media courseware on LAN, WAN and Internet, etc. So students can learn anytime, anywhere.

II. STRUCTURAL DESIGN OF THE RECORDING SYSTEM

With the continuous development of modern educational technology and distant education, many recording and broadcasting terminal equipment have been developed which is suitable for distant education. And some of them are also equipped with course distribution and management system correspondingly. These fruits are general, while distant overseas Chinese education shows great difference and specificity compared with normal distant education. Thus we need to make appropriate selection of products in the market, and then build a more appropriate platform for it[3].

The concept of the system are as follows:

(1) Demo computer of network-connecting

Terminal recording machine is directly connected with the projector. And by logging on terminal recording machine through the network, the demo computer can send the corresponding computerized pictures to the

projector.

(2) Superimposing or switching videos on the computer screen

After the terminal recording machine has received videos, audios and computerized images of presenter, it digitizes them and sent to the projector. The projector can display the computerized images, and on which videos can be superimposed.

(3) Inter cutting the subject, calendar, and speakers' Introduction recorded through online remote entry during the demonstration

During the demonstration, we can inter cut the subtitles telling the purpose and calendars of teaching, the introduction of speakers and notices, etc.

(3) Switching online between several speakers

During the meeting, discussion, or the teacher-student interaction of teaching, we often need to switch between different speakers in order to achieve the purpose of exchanging information. With VGA direct input ports and switchers in the multi-media integrated control room, we can realize the switching between computerized images of different speakers.

(4) The combination of videos, audios and computerized images-webcast

The synchronized videos, audios and computerized images will be processed digitizedly and organized organically by the terminal recording machine, and then be cast online instantly by video streaming extending technology. Its synchronization technology allows images, sound, and computerized images in full synchronism. It can be watched in real time with a browser, and viewers can zoom in and out videos or computerized images. Its images are of high quality but take very little band width, and there is no limitation to the number of points of watching. The media server can be used or not. Without changing the network and its center server settings, it can be broadcasted in the LAN, WAN and WAN million net instantly.

(5) Recording simultaneously

While in the webcast, the terminal recording machine can record its entire contents simultaneously, and turn them into on-demand courseware of web format on IE web browser automatically. The storage location can be specified by the user. Once the live broadcast is over, it is immediately available on demand, which becomes the tool automatically generating web courseware from the daily teaching.

(6) Intelligent combination of multiple videos

Three-way video and audio, one-way computerized images, four-way information reaches simultaneously. Any combination of three terminal recording machine can meet the requirements mentioned before. Among the three terminal recording machine, one is the host machine, the other two are auxiliary. Through the watching terminal, three-way video and audio and one-way computerized images can be seen on the same IE browser simultaneously. Of course, there could be other combinations.

(7) The selection of bandwidth

The selection range of terminal recording machine is very wide in bandwidth. It can be adapted to broadband or narrowband, and LAN or WAN. For example, from 28.8Kbps to2Mbps is optional. Thus, the video in the broadband can achieve the effect of DVD, and video can also be transmitted by using dial-up Internet access.

(8) The strategy of compressing images intelligently

The intelligent variable rate compressing technology is applied to computerized images, reducing transmission quantity and memory capacity to the lowest point. The transmission quantity and memory capacity stay zero when the computerized images don't change. When the images change, the resolution can reach 1:1, which can also be reduced in order to reduce the amount of data to realize the characteristic, high dynamic of transmission on narrow band.

(9) Bandwidth adaptive of watch/on-demand

The record of the terminal recording machine can be achieved on demand through the IE browser. By logging in the web page of the terminal recording machine or related servers, and selecting the relevant records, the playback of record is available.

After on-the-spot investigation, Net@View, the real-time recording and broadcasting machine developed by Beijing Jinkeyu Electronic Technology Ltd. has reached our technical requirements for recording and broadcasting courses. Topology of our system is built on the Net@View[4].

III. DESIGN OF ONLINE LEARNING SYSTEM

Courseware is a kind of important resource to distant overseas Chinese education, which is the electronic teaching materials made by teachers to impart knowledge according to the characteristics of a certain course and their teaching experience. The quality of courseware directly influences the students' interest on learning and their motivation, thus affecting the implementation of the whole distant education. The system we designed combines the video stream, the screen stream and voice stream into one, forming a file. The terminal of recording can not only realize the traditional function of video recording and sound recording, but also easily solve the problem which seems difficult to traditional courseware producing, such as operating or demonstrating

a program online which asks for computer operation and demonstration. Because both the web form and multi-media form will express to the learner clearly.

In order to realize the distant overseas Chinese education better, it's not enough to only have the teaching courseware. Aiming at the specialty of overseas Chinese education, a special website of distant learning need to be built to the learning and exchange of distant learners.

Centring on the courseware generated by the hardware terminals, the structure of online learning system is as follows:

(1) Classify the recorded distant education courses and establish the schedule which allows students to watch online on-demand, and also to download and play on the PC.

(2) It's very popular to communicate online now. So a forum can be built, which is divided into Q & A area for teachers and study & discussion area for students. In the former area, teachers can be arranged to reply on duty, and in the latter area, several topics can be made according to the actual situation.

(3) In order to better serve students of correspondence, aiming at the specialty of overseas Chinese teaching, a special video on-demand column can be opened up to provide on-demand video of Chinese custom and culture to better assist the overseas Chinese education.

(4) In the system, function of registration can also be set up, then manage by dividing authority, and provide students of different levels with different online support.

The system also includes two parts: "catalog search" and "management of network resource".

In the section of "catalog search", students can search what they are to watch in their purview, according to teachers' name, course name, course category and keyword. Thus what they need and prefer can be found conveniently and quickly, and be watched on demand. The System supports real-time and smooth response to fast -forward and fast-rewind. During the viewing, the user can click on chapters, sections and paragraphs which are already set to choose what to watch, and which can also be searched manually according to their actual needs.

The section of "management of network resource" includes modules such as the management of classification of school/ department/ programme, the theme information, keyword, uploading themes in bulk, users and user log, the customization of website and the settings of system. The module of the management of classification of school/ department/ programme can customize different categories, and store the recorded subject according to sorts; the module of management of theme can edit information like the main name, the affiliated department / faculty of main theme, keyword of the theme, brief introduction of the theme, information of teachers, and chapters, sections, segments of the theme; keyword management module can customize certain keywords for concerned personnel to select when they are editing keywords; the module of the management of uploading themes in bulk uploads data in block throuth the way that control the recording terminals of receiving hardware by managers; user management module can add users and set relevant permission to the user; user log management module records users' situation of learning on demand, which makes it convenient to know the user's study; the module of system settings management sets some parameters of the system and has functions[5] like database back-up and recovery, etc.

IV. CONCLUSION

The distant overseas Chinese education system we designed has the following technical characteristics:

(1) With optimized technology of encoding and decoding the video and audio data as kernel of the system, online transmission of relatively good quality with smaller flow can be realized.

(2) The topology combination of the hardware terminals and the hardware environment of multimedia classrooms has been realized, and real-time teaching "studio" has been built.

(3) The unique multi-stream technology has been put to use to record and generate streaming media files such as teachers' teaching video, audio, and PC screen flow for students to learn on demand.

(4) A more comprehensive online learning system has been designed. Put the multimedia courseware generated in the recording and broadcasting into this "container" so that the distant education is no longer boring.

The application of this system will authentically applies the existing campus network to the distant overseas Chinese teaching, striking a new path for the distant overseas Chinese education in the future. We apply this system to distant teaching and distributed teaching, making the distant teaching in school more colorful. Recording system and online learning system are combined to form a fully automated on-demand line platform of online multimedia teaching resources producing, making distant overseas Chinese education no longer boring or isolated, but swim in a more extensive world of network.

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Liang Jie "Correspondence System Of Overseas Chinese Education Based On Internet Structure "International Journal Of Engineering Inventions, Vol. 07, No. 09, 2018, pp. 01-04