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Construction and Application of Video Resources in MOOC Era

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Abstract—**With the rise of MOOC, digital video as a new form of media resources, highlighting its value in practical application, is incomparable to any kind of media and means. In this paper, the characteristics, construction methods and application in the classroom and practice of digital video resources are illustrated with the examples of digging pipe trench in gas major and prestressed concrete classification in civil engineering major in our university. 3D video, as a new learning resource, provides a new visual mode for students, especially in the intelligent era. From the perspective of digital video resources in MOOC, the development and application extend to the impact of video resources on corporate culture. Through school-enterprise cooperation, the construction of courses brings us opportunities and challenges for the integration of cultural creativity and the tourism industry.**

Keywords—MOOC; Digital video; Construction and application

I. INTRODUCTION

With the rapid development of China's higher education and international universities, the construction and application of video resources is becoming an important part of promoting the continuous development of MOOC. Under the active promotion of the Ministry of education, China's MOOC has been developed from scratch six years ago. At present, there are 1291 national top-quality MOOC courses, 12500 online MOOC courses, more than 200 million students participated in MOOC learning online, and 65 million students completed MOOC learning tasks[1]. With the development and application of digital video technology and network virtual reality technology, the construction of video resources in colleges and universities has become the top priority of MOOC course construction. At present, about 60% of the content of a course needs to be recorded into video. Among the teaching methods, video teaching can comprehensively display the style of teachers, present the teaching environment, and enhance the interaction between teachers and students. The open resource construction, which is guided by the independent learning of college students and led by the videos, will become an important direction of the construction of digital resources in colleges and universities in the future, and also the key to improve the quality of education and realize the construction and sharing of MOOC in the new era.

II. CHARACTERISTICS OF MOOC AND DIGITAL VIDEO RESOURCES

The MOOC has changed student's previous learning mode, thinking mode and living habits. It has brought convenience and happiness to student's study and work.

A. MOOC (Massive Open Online Course)

MOOC is a large-scale open online course, which is the product of "Internet + education". It breaks the traditional boundaries of knowledge dissemination and diffusion. According to personal interests and hobbies, anyone who wants to learn can study online, regardless of race and nationality. One only needs a mailbox to register and then participate. Teachers and students can exchange and discuss online at any time anywhere, and answer all kinds of questions. A MOOC course can be attended by tens of thousands of students, and the maximum number recorded is 160000 [2].

B. Characteristics of Digital Video Resources

In addition to the basic attributes of information resources, digital video have many unique characteristics that other media cannot match.

1) Full Range Reproduction of Real Scene
Video teaching can comprehensively show the organization of the whole course, the teaching style of teachers, the enthusiasm of students, the speed of content development and the proficiency of teachers in teaching design, teaching concept and media technology, so that teachers and students can experience the fun of learning in a respectful and relaxed environment.

2) Digitalization of Resource Carrier
Digital video education resources are based on modern information technology. By means of hypermedia, pictures and music pieces can be obtained through production. The carrier can be 2D image or 3D image. The storage mode of the carrier can be classified into disc storage DVD, cloud disk storage, hard disk storage HDD, SDD, disk array, tape Storage HDV, DVCPRO, DV and so on[3].

3) Novelty, Timeliness and Interaction
Interaction is one of the main characteristics of the digital campus. It can stimulate enthusiasm and bring popularity and vitality. It changes the way that teachers transfer information to students in one way. Students and teachers can also exchange roles.. Digital video image fully embodies the idea of the one

learning first is the teacher. Teachers and students can conduct timely and effective discussion and interaction on the spot. The communication inside and outside not only spreads information in real time, but also ensures the dynamic development of digital video resource construction.

4) Recreation of Video Resources

Digital video resource has a large audience and a wide range of applications. It can be further processed and recreated to make it practical and suitable for multi-level exploration. The construction of digital video resource can be improved by 3D tools.

5) Keep Pace with the Times

It is the pursuit of most students to keep pace with the times, update their knowledge in real time with the society, so that they will never fall behind. In the pursuit of information, digital video enables them to meet the joy and freshness of obtaining the latest information[4].

C. Classification of Digital Video Resources

The digital videos can be roughly divided into three categories. The first is learning resources in various forms of micro videos, which can help learners and promote harmonious development of students and things. Teachers and students can exchange ideas, answer questions and release information through the Internet online video. The second is living resources played in public places such as school cafeterias. Students can watch News broadcast, international ball games, current affairs news, etc., while eating. It not only provides teachers and students with high-quality, efficient and convenient life style, but also provides opportunities for teachers and students to watch and discuss together. The third is entertainment resources, such as network video, micro film, DV image, etc., which have been recognized and welcomed by students, and they will become indispensable elements for teachers and students to express themselves and realize their dreams.

III. OPENING STATUS OF DIGITAL VIDEO RESOURCES AT HOME AND ABROAD

With the emergence and rapid development of MOOC, high-quality education resources are highly shared, and the construction of digital video resources is in a rapid development period. It has opened a two-way channel for students to spread knowledge [5]. Since the launch of the "excellent course construction project" in 2003, China's higher education sector has been focusing on the construction of digital video resources, building high-quality open video courses in Chinese universities, in order to further make high-quality video resources that can be accessed and shared by others. At present, many foreign countries open video resources to the public, such as: Khan College of the United States offering 3800 micro-videos for independent learning, covering mathematics, physics, chemistry, astronomy, finance, law and other disciplines. On the one hand, these videos can integrate openness, sharing, and internationalization, promote the construction of high-quality video resources, and improve the society overall participation. On the other hand, due to the popularity and application of digital video technology, and the

"Internet + education", the scale construction of digital video resources at home and abroad has been promoted, and the construction of video resources has gradually stepped onto the track of video and audio[6].

IV. CONSTRUCTION AND PRODUCTION TECHNOLOGY OF DIGITAL VIDEO RESOURCES

From the text to the multimedia courseware demonstration, and then to the video recording, the resource construction is now developed into the live video broadcast. The specific construction is as follows:

A. Focus on the Content Construction of Video Resources

1) The Actual Scene Enters the Classroom

In the university, many courses contain the content that needs to be shown in actual operation so that students can truly understand. However, it is impossible to lead students to visit the scene in every link. Solving this problem through video and image can achieve twice the result with half the effort. For example, before excavating the pipe trench in the course of gas specialty, it is necessary to know the location of other buried pipelines in the area, and it is not allowed to excavate blindly. In the process of excavation, there are professional and practical issues, such as how to make judgment and treatment for unidentified structures, how to determine the cross-section form of the trench according to the situation of groundwater, the nature of soil and the size of pipe diameter, etc. Relying on classroom teaching, it is difficult to enable students to get a comprehensive understanding. With the image of the actual environment on site and the detailed and vivid explanation of the teacher, the students can clearly understand the operation content, operation process, precautions and standards. What's more, for the classification of prestressed concrete in civil engineering major, the predesting method is to tension the prestressed reinforcement before pouring concrete and temporarily fix the prestressed reinforcement on the pedestal or steel formwork, then pour the concrete, loosen the prestressed reinforcement after the concrete reaches a certain strength, and make the concrete produce the preloading stress with the help of the bond between the concrete and the prestressed reinforcement. It is difficult to understand how to fix the prestressed reinforcement on the pedestal and how to achieve the strength to relax the prestressed reinforcement. However, with the video, the process and method of fixing on the pedestal can be clearly seen with digital image, and the change of concrete strength can be observed[7].

2) Making famous teachers everywhere

For most students, the famous "Ivy League university" such as Harvard and Stanford is unreachable. It's a dream to study with the students of the world famous universities. With the development of the internet, dreams come true. Listening to famous teachers' lectures can make you feel their profound knowledge and profound theoretical foundation. The lecture style and morality of famous teachers are unforgettable. Launch a video recording project for some key and excellent courses lectured by famous teachers with great influence, profound connotation and charm personality in the school. The means to record videos of characteristic subjects or forward-looking courses will enable more students have the opportunity to listen to the famous teachers, and encourage a

large number of peer teachers to constantly improve their education and teaching level[8].

3) New Ways to Expand Quality Education

The education in university is people-oriented education and moral education comes first. Compared with intellectual education, moral education in schools is not so desirable in contents, methods and effects. Digital video is a lively, natural media means that is close to life. By shooting DV (such as saving resources, starting from me), microfilm to tell touching events around, students can stimulate their innovative thinking and enthusiasm, and team spirit, improving comprehensive quality level[9].

B. Production Technology of Video Resources

1) Video Studio Shooting

The recording and broadcasting system is widely used in the development of teaching video resources. In the recording and broadcasting room, the recording and broadcasting system can be used to record automatically. It also has the functions of synchronous recording, real-time live broadcast, automatic tracking, etc. It can record the whole process of teachers' teaching situation, students' listening state, teaching PPT, teacher-student interaction, electronic whiteboard content, etc. However, due to the fixed camera and single view angle in the studio, it is difficult to display the teaching scene in an all-round way.

2) Smart Classroom Shooting

Most of the smart classrooms are equipped with camera tracking system, and another camera is fixed on a tripod to assist camera tracking and shooting, so the shooting content can be complete without any defects.

3) Multi Cameras Shooting

Multi cameras shooting usually refer to the recording method of more than two cameras in the whole process of teaching. Multi-camera shooting can not only comprehensively display the teaching art and teaching style of teachers, but also record the teaching situation and the relationship between the teaching elements in the teaching process. It is the main method of shooting excellent video courses and excellent demonstration video courses at present. In the shooting process, the zoom lens, angle, scene and other factors of the camera are generally used to track the picture clearly and accurately. Through continuous switching between the placements, teachers' teaching and students' listening scenes are organically combined in the field of vision. At the same time, standardized composition, stable shooting and rapid captures of the wonderful scene of communication and interaction between teachers and students are used, showing the real classroom atmosphere.

4) 3D Viewing Angle

In the era of intelligence, intelligent learning resources need to be improved. 3D video, as a new learning resource, will become a new form of digital education resources. 3D video can provide realistic three-dimensional images for knowledge seekers, so that they can gain a lot in learning experience. 3D video can promote students' memory and understanding of knowledge, create the most natural and intuitive learning situation, and strength students' studying interest. The application of 3D video resources in education and teaching is pioneering and prospective.

V. EXTENSION APPLICATION OF DIGITAL VIDEO RESOURCES CONSTRUCTION

With the advent of the "Internet plus" era, the integration of culture and enterprise has become a prominent feature of the transformation of undergraduate colleges. In order to realize the great development and prosperity of China's cultural and creative industries, enterprises must rely on the school-enterprise alliance to carry out organizational innovation cooperation, integrate resources, and build a win-win situation. Under the background of promoting the transformation of industry and city and enhancing the soft power of culture in the 21st century, cultural creativity and tourism integration can not only develop rich human value and economic resources for tourism, but also provide a broad road for cultural creativity to be transformed into social wealth[10].

With the development of society and students' higher and higher demand for spiritual and cultural living standards, the demand for cultural tourism grade is also increasing. Many students like ice and snow sports and ice and snow tourism, making "cold resources" into "hot economy". Take the annual ice and snow festival in Harbin, Heilongjiang Province as an example - the ice and snow turns into a source of money for locals. Since December 31, 1999, CCTV has demonstrated the ice and snow culture and ice and snow tourism of Harbin, a famous city in the north, to the whole world through satellite video; the ice and snow image of Harbin has penetrated into thousands of households. The video details that Harbin Songhua River Ice and Snow World is located in the sand beach in the middle of Songhua River section, with a total length of 1030 meters and a maximum width of 25 meters, covering an area of nearly 200000 m^2, with a total ice consumption of 60000 m^3 and a total snow consumption of 130000 m^3. In the face of the once-in-a-lifetime historical opportunity, how to give full play to Harbin's advantages in time and space, structure pattern, and deepen the idea of "ice and snow + sports"? That will be the theme of Harbin Ice and snow world joining hands with sun island snow Expo. Ice and snow integration will lead to the new direction of winter ice and snow tourism. Digital micro-video will be used to show the world the perfect combination of ice and snow sports and ice and snow stage, highlighting Harbin's uniqueness. The most effective marketing means is to create an international brand through film and television, promote the upgrading of tourism consumption, and realize film and television + tourism.

VI. THE VALUE OF RESOURCES CAN BE REALIZED ONLY THROUGH COMMUNICATION AND SHARING

The most significant advantage of digital education resources is sharing. Colleges and universities can make wide applications with their rich resources. Only through communication and sharing, can they play the maximum effect of resources and realize their real value.

The sharing of resources not only concerns the mutual application between colleges and universities but also reflects the overall level of harmonious construction of the whole society. In the new era, the new teaching mode, open video course, will make the education open wider, pay more attention to the construction of digital video resources. Through sharing, the needs of all levels of students for knowledge and skills can be met.   In this way, it is possible to achieve "equal emphasis on teaching and learning", "mutual improvement of teaching and learning", and to achieve the construction and sharing of high-quality resources for all[11].

VII. SUMMARY

Due to the limited conditions, it is impossible for students to visit the site in person in every link. However, it can achieve twice the result with half the effort to solve this problem through video. For example, the classes of gas major are digging pipe trench, and the classes of civil engineering major are prestressed concrete classification in our university. At present, in response to the call of the Ministry of Education of the People's Republic of China to "build quality courses and eliminate defective courses" and to build China's quality courses, we advocate the construction of online and offline hybrid quality courses, virtual simulation quality courses and social practice quality courses. In the construction of quality courses, the most important part is the construction of digital video resources, especially 3D video as a new learning resource which will become a new form of digital resources, and a new visual model.

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