Research on the Construction of Digital Online Education Video Open Course

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Abstract. As an important part of digital online education, video open class has attracted wide attention from all walks of life since their implementation. It will have more far-reaching significance and development prospects to use the MOOC platform to carry out excellent video open classes with characteristics of various universities. This paper puts forward concrete construction methods and countermeasures from three aspects of learners, educators, and quality systems, which is of great significance to promoting the construction and development of open video courses in Colleges and universities.

Keywords: Digital online education · MOOC platform · Quality system · Video open class

1 Introduction

Today, with the diversification of social and educational resources, the Internet has carried out new learning and education reforms, and higher education has become more and more internationalized. The problem of competition for high-quality students at home and abroad [1]. Taking the United Kingdom as an example, to promote the market competition of private and public institutions of higher learning more quickly, the government has reformed the previous mode of financial appropriation for colleges and universities and has been promoting new forms of public and private universities since 2010 [2]. Therefore, colleges and universities have to combine the latest development in Internet technology to explore new education, teaching, and business models. MOOC, (Massive Open Online Course) as a new online teaching model, came into being in this context.MOOCs are mainly based on two models: one is the cMOOC model based on the relational learning theory, and the other is the xMOOC model based on the behaviorist learning theory [3]. cMOOC is a model in which learners can share creative knowledge through independent learning and mutual assistance, and use a variety of platforms and services to learn in community networks. Its curriculum model is more inclined to construct and create knowledge. Focus on social network learning, xMOOC is an online teaching model similar to traditional teacher teaching. It learns independently on a centralized platform. The course model is in line with the traditional teaching process and concept. It tends to spread and copy knowledge, pay attention to videos, assign homework and conduct tests, etc. learning method [4]. From the surface meaning of MOOC,
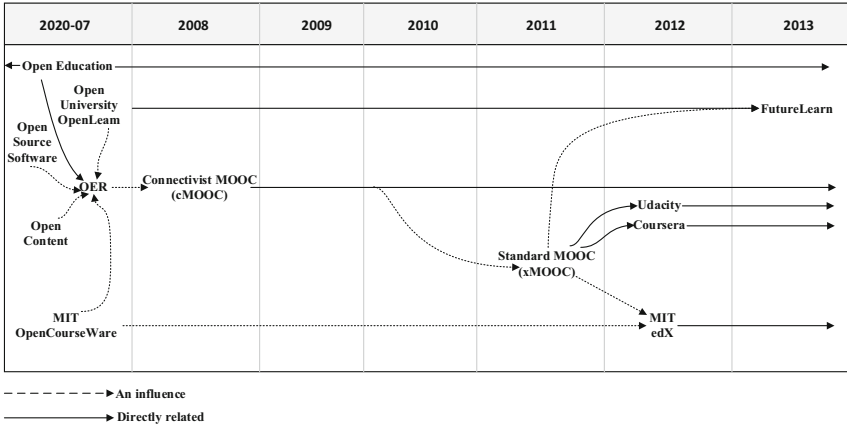
Fig. 1. The development process of MOOC [Owner-draw]

MOOC simply means "massively open online courses". With the emergence of the world's first MOOC "Connectionism and Connection Knowledge" in September 2008, many famous universities in the world are developing towards "Global Universities", and top universities continue to promote mutual education with their educational level. A suitable MOOC course [5]. At the same time, a series of MOOC platforms that are free from registration, learning, and materials, without any hidden expenses, and accessible through mobile phones, tablets, and computers, are also rapidly emerging [6]. Such as three famous platforms: Udacity, an online cutting-edge technology education platform founded by Sebastian Thrun in 2011, Coursera platform established by Stanford University in 2012, and a massive open online classroom platform jointly created by MIT and Harvard University in April 2012 edX Platform. The new teaching concept of MOOCs can not only meet the global demand for higher education but also bring a new teaching model to colleges and universities around the world. As a revolutionary new education method, its influence on China is also far-reaching. China first ushered in the MOOC wave in 2013. In October of the same year, Tsinghua University launched the online education platform "Xuetangxing" on edX, while Peking University chose to sign a cooperation agreement with edX and Coursera [7]. At the same time, many universities such as Fudan University and Shanghai Jiaotong University have joined the Coursera platform, and many famous schools have participated, which has accelerated the rapid development of MOOC in China [8]. Therefore, 2013 is also known as the first year of MOOC in China. The development process of MOOC is shown in Fig. 1.

2   Take Learners as the Center, Build Talent Training Ideas, and Build a Unified Resource-Sharing Platform

The education system of MOOCs is people-centered. Whether it is the construction of teaching ideas, the selection of teaching resources, or the formation of educational concepts, they are all based on meeting the learning needs of learners. Generally speaking, people-oriented. Therefore, before designing a curriculum system for high-quality video

courses, the first thing to do is to determine what kind of skills and literacy learners are to be cultivated, and what methods to use to cultivate learners. We must know that the reform and construction of the talent training model must conform to the laws of education and teaching. Therefore, while using the MOOC platform to set up high-quality video courses, we need to set up a talent training plan for learners, and the plan must reflect a specific training model, set training goals that can provide support, and build a teaching-centered, teaching-centered, Learning-centered talent training ideas. Colleges and universities should take the initiative to connect with the national development strategy, actively integrate into local economic and social development, actively meet the needs of local industrial development, and take "production, learning, and research" as a breakthrough point to cultivate talents with distinctive characteristics and remarkable results in education. The way of cultivation. In the process of choosing educational resources, learners will pay special attention to the convenience of obtaining digital online educational resources. Therefore, colleges and universities should innovatively design the learning terminal interface of video open courses, and choose a better MOOC course platform for cooperation, so that learners can add an emotional experience to their learning and build a friendly "human-machine" relationship [9]. To facilitate data exchange and information resource sharing among various sharing platforms, colleges and universities should build a unified standardized digital resource-sharing platform, and set up complete functions such as user management and resource management, so that users can quickly select and use online video courses.

3   Optimize the Quality Assurance System and Establish a Guarantee Mechanism for Sharing Educational Resources

The construction of high-quality video courses needs to achieve three degrees of conformity: the degree to which the actual working state conforms to the training objectives determined by the university; The training goal is the degree to which the quality standard needs to meet the needs of the society, learners, and state regulations; The training result is the degree to which the learners who learn through the course need to meet the training objectives [10]. When building high-quality video open courses, colleges and universities must establish quality standards by the training objectives determined by the school itself, and provide personnel and financial conditions in combination with multiple departments. The Office of Academic Affairs should also strengthen the supervision of the teaching process, conduct self-evaluation of courses and teachers' teaching, continuously collect information, accept social evaluation, and improve quality monitoring and feedback. High-quality video courses require colleges and universities to build a complete quality assurance system, overall control of quality regulation and control, continuous improvement and improvement, and the formation of closed-loop management. The complete quality assurance system is shown in Fig. 2. To optimize the quality assurance system, it is necessary to have quality supervision agencies and personnel, quality objectives and standards, human and material resources, management systems and implementation, quality monitoring and evaluation, and information feedback and improvement. To accomplish all of the above, colleges and universities are required to continuously improve in the entire process of building high-quality video open courses, and none of them are indispensable.
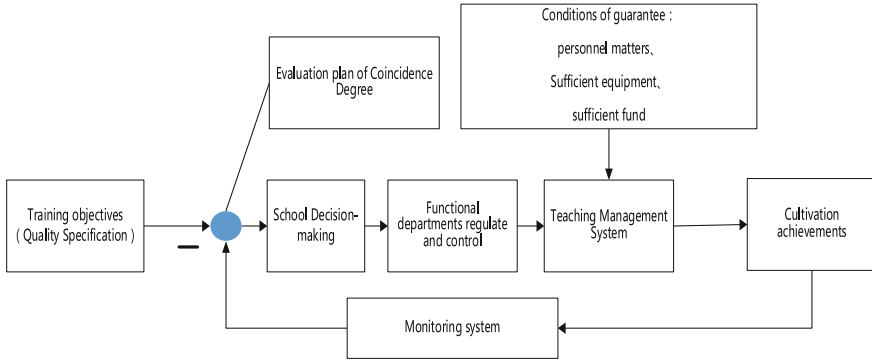
Fig. 2. Frame diagram of the quality assurance system [Owner-draw]

Before building an education-sharing platform, colleges and universities must first establish a sound educational resource management system, a reasonable management system, and an incentive mechanism, which can promote the development of high-quality video open courses and encourage more teachers to invest in the construction of open courses. In addition, colleges and universities should set up professional resource management institutions to strengthen the awareness of intellectual property protection. The high-quality video open class is an educational resource open to the whole network. Before recording, teachers and students have the right to know, and colleges and universities can also adopt digital property protection technology to protect the copyright of the video. Such as adding watermarks, encryption, CA certification, and other technical means to restrict users from copying and disseminating network resources, etc. These can achieve the purpose of protecting the copyright of high-quality video open courses.

4   Build a Knowledge Graph of Online Education and Strengthen the Systematic Construction of Online Courses

Google put forward the concept of knowledge graph technology in 2012 based on semantic web technology. Knowledge graph technology intends to describe all the things in the world by building a large-scale triplet knowledge base. At present, knowledge graph technology has been applied in many fields, and there are many large-scale knowledge maps, such as DBpedia, OpenID, and Wikidata.

This paper researches how to build an online education knowledge graph, and The proposed construction process is shown in Fig. 3.

There is a large amount of unstructured data in the field of online education courses. Using the existing data of online education courses to extract the relationship, entity recognition, and attribute of data through machine learning, neural network, and other technologies [11], among them, the BiLSTM (Bidirectional Long Short-Term Memory) model and Bert model on the deep learning machine have a good effect at present. As shown in Fig. 4, the network structure of the BiLSTM model mainly includes update gates and forgetting gates.
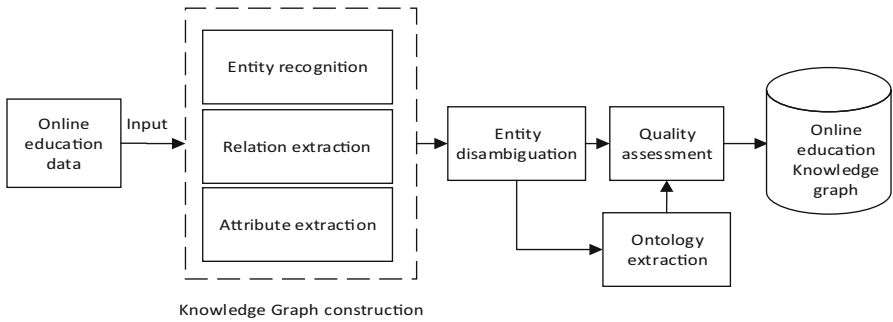
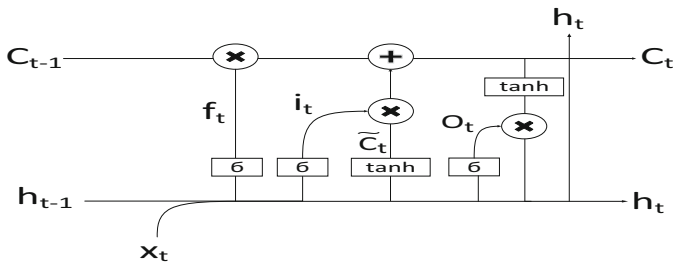Fig. 3. Construction of an online education data knowledge graph [Owner-draw]

Fig. 4. Construction of BiLSTM model [Owner-draw]

The update gate is calculated by the following formula:

$$i_t = \sigma(W_i \cdot [h_{t-1}, x_t] + b_i) \tag{1}$$

$$\tilde{C}_t = \tan h(W_c \cdot [h_{t-1}, x_t] + b_C) \tag{2}$$

The forgetting rate is calculated by the following formula:

$$f_t = \sigma(W_f \cdot [h_{t-1}, x_t] + b_f) \tag{3}$$

The output state is calculated by the following formula:

$$O_t = \sigma(W_O[h_{t-1}, x_t] + b_o) \tag{4}$$

$$C_t = f_t * C_{t-1} + i_t * \tilde{C}_t \tag{5}$$

$$h_t = O_t * \tan h(C_t) \tag{6}$$

It represents the current input data, ht-1 represents the input at the previous time, ht represents the current input, σ Is the sigmoid function with a value range of 0 to 1, Wf, Wi, Wc, Wo, bf, bi, bc are the weight matrix, and tanh is the activation function.

For the extracted knowledge triples, entity disambiguation, as well as overall quality assessment and feedback are required. Finally, circular processing is required to form an online education knowledge graph with good quality. The online education knowledge graph can clearly show the online curriculum knowledge and their connections, providing knowledge support for the quality improvement of the online curriculum system.

5   Conclusion

The most prominent feature of high-quality video open courses is that these courses are open to the outside world. With the help of the MOOC platform for public broadcast, teachers' teaching content, teaching quality, and level will be more widely evaluated and supervised by students, peers, and the public. It is a new challenge, and at the same time, it can also expand the scope of knowledge dissemination. The Video-open classes are of positive significance to the improvement of students' and teachers' self-learning abilities. Building an online education knowledge graph is conducive to analyzing and improving the quality of the online education curriculum system. Therefore, the open video course must be a high-quality course that has been tested by teaching practice. Specifically, each school must be based on "famous teachers and famous courses", combined with the school's school-running characteristics and subject advantages, to fully demonstrate advanced teaching concepts and first-class teaching.

References

1. Huang Ronghuai, Yang Junfeng, etc. From digital learning environment to smart learning environment - learning environment Changes and Trends of the Environment [J]. Open Education Research, 2012, 18(1): 75–84.
2. Qian Ling, Xu Huifu. Development Trends and Trends of Online Education in the United States--Key Points and Reflections on CHLOE 4 [J]. Open Education Research, 2020, 26(4):13.
3. Gong Hui. Opening the 2.0 Era of Online Education Technology [J]. Modern Educational Equipment in China, 2019(21):22.
4. Yuan Li, Stephen Powell, Bill Oliver, et al. Post-MOOC Era: Sustainable Development of Online Education in Colleges and Universities [J]. Open Education Research, 2014, 20(3):9.
5. Han Xibin, Zhai Wenfeng, Cheng Jiangang. The dialectical analysis of cMOOC and xMOOC and the integration of higher education ecological chain[J]. Modern Distance Education Research, 2013(6):8.
6. Chen Zhengfeng, Zheng Pei, Liu Nan. Research on O2O College English Teaching Model in the Post-MOOC Era [J]. Educational Academic Monthly, 2020(5):5.
7. Wang Dianxia, Chen Yanping. Research on the innovation of MOOC teaching mode in colleges and universities under the background of big data [J]. Information Science, 2019, 37(11):6.
8. Hanafin, Joan. Multiple intelligences' theory, action research, and teacher professional development: The Irish MI project [J]. Australian Journal of Teacher Education,2014, (4): 17–23.
9. Jonson H. Using flipped classroom, peer discussion, and just-in-time teaching to increase learning in a programming course [J]. Proc. of the FIE,2015,(5):11–17.

10. Tian Shenghu, Zhao Xuemin. The impact of online education on college teaching and its teachers and students: Taking SPOC as an example [J]. Educational Informatization in China, 2016(6): 1–4.
11. Gutierrez C, Sequeda J F. Knowledge graphs[J]. Communications of the ACM, 2021, 64(3): 96–104.