College Sports Innovation MOOC Platform Based on Big Data and Cloud Computing Technology

Chaoqi Fu[(✉)]

Jiangxi Science and Technology Normal University, Nanchang 330038, Jiangxi, China
476645325@qq.com

Abstract. At present, the current situation of our country's common colleges and universities physical education teaching is: students did not pay enough attention to physical education, the content of physical education is also quite monotonous, it is difficult to arouse students' interest in physical education. In order to carry out physical education smoothly and efficiently and enhance students' interest in physical exercise, advanced technologies such as information, computer and network are used to establish a sports MOOC innovation platform, which provides basis and support for solving a series of problems in physical education in the network era. On this basis, this project intends to use big data and cloud computing technologies to build an innovative platform for college sports MOOC, and conduct systematic experimental and theoretical analysis on it [1].

Keyword: MOOC · Big data · Cloud computing

1 Introduce

Moocs, or MoOCs, are short for large-scale, open and online learning in Chinese. MOOC (MOOC) is an Internet-based, open, distributed and widely shared network micro course, which has a broad application prospect. In recent years, with the rapid development of information technology [2], MOOCs have become popular all over the world. Moocs are the products of "Internet + education", which break the restrictions in time, space, resources, language, culture, region and other aspects, create a new type of educational productivity, and cause a great change in the way of education. The establishment and application of "MOOCs" has provided an effective new way for universities to cultivate teaching means, methods and talents, broadened the sharing of high-quality teaching resources, and improved the teaching quality. At present, the main body of MOOCs is institutions of higher learning. Nationwide, there are 1,454 online education institutions with about 950,000 teachers, providing 7.133 million times of online education [3], and 1.18 billion students participating in online education. Fully demonstrates the superiority of "Internet + education, intelligence + education". Before that, MOOCs had been used more often in classes of other subjects, but less often in physical education classes at regular colleges and universities. On the basis of this, combined with the actual conditions

of Chinese colleges and universities, this paper discusses the feasibility and feasibility of the application of the MOOC in ordinary colleges and universities, and combines the actual conditions of Chinese colleges and universities, and gives the corresponding experiment and theoretical analysis [4].

2   Research Methods

2.1   Document Data Method

Through the research on the construction and technology of MOOCs at home and abroad, this paper analyzes how to build the platform of sports Moocs. In 2011, Stanford University pioneered Moocs, or MOocs, when it launched three free online courses that quickly attracted 100,000 online enrolments. With the advocacy and implementation of Stanford, MOOOC has been widely used around the world. Edison, Udacity and Coursera in America and Futuroversity in Britain are among the leaders in Moocs, while Iversity in Germany and Veduca in Brazil are not far behind. As a result, MOOCs have flourished. It is the year of China's "MOOCs era". Tsinghua University and Peking University officially entered "Edx" in 2013, becoming the leading figures in the development of China's "MOOCs". At the same time, a large number of excellent MOOCs service platforms have emerged, such as "Xuetang Online", "China University MoOCs" and so on [5].

2.2   Expert Interview Method

Through interviews and investigations, the author has conducted in-depth research on sports teaching management leaders, front-line teachers and college students in some universities in China, so as to understand the existing problems and areas to be improved in sports MOOC teaching. At present, there are still many problems and shortcomings in Chinese MOOC teaching, such as high degree of curriculum homogeneity, insufficient effectiveness of interaction, rough making of courseware, serious repetition of construction and so on. We should face up to the problems, correct the mistakes, make full use of the advantages of MOOCs and promote the reform of teaching concept, teaching model, teaching method and technology.

2.3   Questionnaire Survey and Mathematical Statistics

The data collected in the process of investigation were used to make questionnaires. A questionnaire survey is carried out on the leadership, teaching and learning level involved in MOOCs teaching, and the results are analyzed and summarized. Thus provides the foundation for the construction of college physical education network platform in our country.

3 Results and Analysis

3.1 Constructing Sports MOOC Teaching

At a video conference on course construction of "International Platform for Online Education in Chinese Universities" hosted by the Department of Higher Education of the Ministry of Education, the department said that the implementation of online education in universities has made obvious progress, and the online opening has been basically completed. Modern information technology in teaching and learning completely permeate, so that teachers "teaching", students "learning", school "management" three organic combination, so that the teaching "form" changes. In the Opinions on Deepening the Reform of Education and Teaching and Comprehensively Improving the Quality of Compulsory Education, the strengthening of physical quality is regarded as one of the contents of the "Five Education", and the requirements of "five education simultaneously" are put forward. The Outline emphasizes that creativity and creative education should be strengthened so that students can learn how to learn. On the issue of innovation and creation education, it is emphatically pointed out that the research and practice of subject, curriculum and classroom with innovation and creation education as the core should be carried out. In the process of optimizing students' learning mode, the in-depth combination of information technology and education and teaching should be promoted to build future learning scenarios based on the Internet of Things, big data, virtual reality and artificial intelligence, so as to promote students' individualized learning. Physical education is a very important public basic course in colleges and universities. The course enhances the possibility of continuous expansion of physical education teaching content. The open feature of MOOCs enables students to learn more sports knowledge and skills while learning the physical education courses of our school, and to have access to more extensive and high-quality physical education courses of other schools, so as to continuously improve their physical quality.

3.2 Technical Support for Building an Innovative Platform for Sports MOOC Teaching

1. **The development framework of sports MOOC platform.**

On this basis, to .NET core as the core, combined with Microsoft Corporation's latest research and development of a set of Internet, cloud computing for the new network application software as the basis, the realization of the Internet, cloud computing, cloud computing for the new network application software modular design. Compared with other network architectures, .NET core has the following advantages: it can be developed and operated on Windows, MacOS, Linux and other operating systems; Integrating new client architectures and development processes with built-in dependency injection; "Ready" and "context-based" in cloud computing. Based on the .NET core architecture, intended to .NET core architecture as the core, using ASP.NET core MVC architecture, to achieve efficient, easy to expand, separation of concerns and other advanced computing technology. NETCoreMVC divides the application into three parts: Model: The Model is used to wrap the software and all the data that makes the business logic or action. A

view is a tool for presenting information on a user interface. The software utilizes the RazorView engine to .NET code is embedded in HTML tags. The Controller is a bridge between the model and the view, and its job is to handle user interaction, use the model, and finally decide which view to display. In this architecture, the user requirements are passed to the control program, and then the corresponding module is called through the control program to complete the processing of the user requirements or obtain the query results. Once the data is modeled, it is transferred to the control program, which decides which view will be presented to the user. This allocation of responsibilities helps you tailor your application to complexity because it makes it easier to code, debug, and test components that include individual tasks.

2. **Systematic advantages of sports MOOC platform.**

As an open, open source teaching platform, compared with other teaching platforms, it should have a unique way of development. Only in this case, their personality charm can be fully reflected. Data design method: Using the principle of dependency inversion. The principle of correlation inversion is that a program relies on an abstract interface rather than a concrete implementation. The principle is that you only need to write an abstraction, not a concrete implementation, thus reducing the coupling between the user and the concrete implementation. Data programming techniques: Interface - based programming methods. An interface is a collection of software rules that specify the classes that can implement the interface. For example, in this study, the course-icourse interface defines rules for adding, modifying, deleting, and acquiring courses, which solves the problem of single inheritance of classes in the form of an interface. During the construction and analysis of system architecture, the interface can be distinguished into two types, one type of interface can be distinguished into two types, one type of interface can be directly given to its above the other type of interface, it can be defined by a set of interfaces. EF core can be used as an Object Relationmapper (O/RM), enabling .NET developers can take advantage of .NET target to process the database. Instead of selecting, inserting, updating, and deleting these languages, let developers do this easily through Lambda expressions.

3. **The key network technology of sports MOOC platform.**

In college physical education, registration, certification and authorization are required before teaching activities can be carried out. At the same time of learning, the system can also learn time, content and other information input into the system. To track student learning. Collecting and analyzing students' academic status is the basis of building big data. In order to achieve this, we use Microsoft's certification system — ASP.NET certification system to achieve this, we can be very convenient to set up and maintain this certification system. Its main functions are: manage authentication, authorization,

data protection, HTTPS execution, application security, request anti-counterfeiting protection, and management of CORS. Third party identification services (such as wechat, Weibo, Facebook, Twitter or linkedin) can also be embedded in the identification system .NET core program has good security and reliability. The certification process: The student submits the certification and compares it with the certification stored in the operating system, database, application or resource. For example, after students enter their student number, name and school, they can log on to the MOOC platform to find out which course they want to take. During authentication, when the authentication is met and the authentication is passed, the behavior that is granted permission can be performed. If you pass the trainee status, you can follow the suggestions on the platform to train. In ASP.NET core identity, authentication is achieved through IAuthenticationService. The authentication mode is specified by registering the authentication service in the startup configuration service. Responsible for the certification and authorization of students. Cloud computing refers to computing services for servers, storage, databases, networks, software, analytics and intelligence, using Internet networks to provide rapid innovation, resilient resources and economies of scale. In general, we simply pay as needed, which helps reduce operational costs, make the infrastructure more efficient, and adapt to changing business needs. This protects data, applications, and infrastructure from being compromised. Based on the powerful capabilities of cloud computing, Microsoft Azure and other cloud platforms can ensure the safe and efficient operation of platforms (Fig. 1). Among them, uploading and storing the content of MOOCs is an important step. Streaming of audio and video is the guarantee of this platform (Figs. 2, and 3).
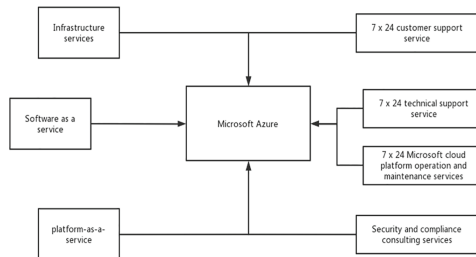
Fig. 1. Cloud computing

```
private string ProcessUploadedFile(CourseCreateViewModel model)
{
    string uniqueFileName = null;
    if (model.Video != null)
    {
        string uploadsFolder = Path.Combine(_webHostEnvironment.WebRootPath, "images");
        uniqueFileName = Guid.NewGuid().ToString() + "_" + model.Video.FileName;
        string filePath = Path.Combine(uploadsFolder, uniqueFileName);
        using (var fileStream = new FileStream(filePath, FileMode.Create))
        {
            model.Video.CopyTo(fileStream);
        }
    }
    return uniqueFileName;
}
```

Fig. 2. Course upload

```
[HttpPost]
public IActionResult Edit(CourseEditViewModel model)
{
    if(ModelState.IsValid)
    {
        var course = _courseService.GetById(model.Id);
        course.Title = model.Title;
        course.Description = model.Description;
        course.Category = model.Category;
        if(model.Video != null)
        {
            if(model.ExistingVideoUrl != null)
            {
                string filePath = Path.Combine(_webHostEnvironment.WebRootPath,
                    "images", model.ExistingVideoUrl);
                System.IO.File.Delete(filePath);
            }
            course.VideoUrl = ProcessUploadedFile(model);
        }
        _courseService.Update(course);
        return RedirectToAction(nameof(Index));
    }
    return View(model);
}
```

Fig. 3. Course storage

4　Conclusion

With the rise of sports MOOCs, the content of traditional physical education courses has been enriched. In traditional physical education courses, the relatively monotonous explanation of theoretical knowledge and action essentials has become a kind of behavior that students are willing to learn, study and practice. Moocs are an effective supplement to college physical education, which can improve students' understanding of sports, achieve the purpose of strengthening the body and cultivating the sentiment, and firmly establish the idea of lifelong sports in people's concept. In order to achieve "happy, enhance physical fitness, exercise will, perfect personality" for the purpose of school physical education in the new period. With high-definition video and audio available worldwide, sports MoOCs can be used from any device (PC, tablet, mobile, etc.), anytime, anywhere, to learn, exercise, and connect and interact with other students. In cloud computing, analytics can be performed across all teams, departments, and locations to achieve data consistency. Using cloud computing technologies (such as machine learning, AI, etc.) to mine information to help enterprises make better decisions. However, continuous improvement is still needed in the planning of sports MOOC platform construction and operation, platform construction work, course standard approval and technical specifications, learning feedback service and other aspects. In college physical education, MOOCs are an effective supplement and supplementary means. To make it play a better role, it needs the participation of teachers and students.

References

1. Sun Kuai Hua, Liu Fengxiang, Chen Jiaqi, Chen Peiyou. Research on the Development Trend and Countermeasures of Chinese Sports Informatization [J]. Journal of Xi'an Physical Education University, 2007(1):7–12.
2. Sun Yusheng, Cheng Yanan, Zhu Lijun. Research on the Construction of University Teaching Model Based on MOOC [J]. Journal of Distance Education, 2015, 33 (3):65–71.
3. Zhang Yibin, Zhu Xijun, Liu Chuanshen, Song Jinhong. Research and implementation of Mine Geological Environment Information System Based on Asp.Net MVC Framework [J]. Urban Geology, 20, 15(1):97–102.

4. Chen Guoxing. Research on Storage System Application Based on Microsoft Cloud Platform Microsoft Zure [D]. Nanning: Guangxi University, 2017. (in Chinese)
5. Xu Lei. Design and implementation of Civil servant Selection Evaluation System [D]. Chengdu: University of Electronic Science and Technology of China, 2010.