*Research Article*

# Analysis of the Development Status and Impact of MOOCs in American Higher Education[*]

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## Abstract

The concept of MOOCs was born in Canada but has been developed and widely used in the United States. This paper analyzes the development status and impact of MOOCs in American higher education in order to guide the development of MOOCs in China's higher education. Based on literature review, case study and comparative study, this paper summarizes and analyzes the development status and problems of MOOCs in the United States. Taking the Pattern-Oriented Software Architectures (POSA) of Vanderbilt University as a practical application case, this paper summarizes the experience in the design, management and evaluation of MOOCs. The results show that MOOCs play an important role in promoting the development of American higher education. The analysis of the application of MOOCs in American higher education has enlightening significance to the development of MOOCs in China.

## Keywords

MOOCs • American Higher Education • Development Status • Case Analysis

Massive Open Online Courses (MOOCs) was proposed by Canadian scholars in 2008, and presents a blowout trend after 2012. MOOCs integrate the idea of open education and combine the advantages of online education to create the wave of open learning across the world, in which the United States enjoys the widest range of applications and the largest number of lecturers because of its advanced and open higher education, and the application of MOOCs in American higher education provides a positive case for the global promotion and research of MOOCs (Hansen & Reich, 2015).

The rapid development of Internet technology provides a convenient way for the dissemination of MOOCs, the international demand of first-class universities provides opportunities for the development of MOOCs, and the substantial increase in investment costs of higher education lays the economic foundation for MOOCs (Martin, & Fred, G., 2012). Some achievements have been made in the development of MOOCs in the world, the application of MOOCs in famous universities has reached a certain degree, and scholars all over the world have conducted extensive research on MOOCs in colleges and universities. However, the research on the development of MOOCs in the United States where MOOCs have been most successfully and widely applied is still blank (Subhi *et al*., 2014).

This paper analyzes the development status and impact of MOOCs in American higher education in order to guide the development of MOOCs in China's higher education. Firstly, it analyzes the development status of higher education, and then analyzes the impact of MOOCs on higher education in theory and practice.

## Overview of MOOCs and Its Development in the United States

**MOOCs**

Massive Open Online Courses (MOOCs) are characterized by the fact that anyone can participate in the courses free of charge, and it also supports an infinite number of learners to participate in the learning process, with massive learning scale.

**Difference between MOOCs and online network courses** Online network courses display the teaching content with texts and multimedia forms such as images and animation and carries out the teaching activities with teachers as guide and students with major body based on the principles of cooperation, openness, interaction and sharing. Online network courses are products of the popularity of computer network. The basic composition of traditional classroom is still reflected in online network courses, and limits the application of online network courses to some extent (Seaton, Bergner, Chuang, Mitros & Pritchard, 2014).

MOOCs can provide learning services for a large number of learners around the world, and provide opportunities for learners without limitations of time, place, economy, academic degree and other aspects. MOOCs get rid of the limitation of the basic composition of the traditional classroom, and can provide learning anytime and anywhere as long as the learners participate in the learning process, realizing the open communication, interaction, cooperation and shared learning environment (Savi, van der Maas& Maris, 2015).

**Research on MOOCs** Figure 1 shows the number of MOOC-based documents retrieved worldwide since the birth of MOOCs in 2008.

From the figure, we can see that the global literature quantity of MOOCs is increasing year by year, and the research on MOOCs has been a hot issue in the industry.

**Development of MOOCs in the United States**

**Motivation for the development of MOOCs:** The rapid development of MOOCs benefits from the following three aspects: 1. With the rapid development of Internet technology, the popularity rate of computers in the global range of households reaches more than 70%. The popularity of the Internet and the development of social platform provide a suitable environment for the development of MOOCs. 2. The internationalization demand of the first-class universities makes MOOCs become a carrier. The first-class universities in the world can show their curriculum to the full-time learners, promote their internationalization level, realize their global expansion, and enhance their reputation with MOOCs (Möller *et al.*, 2017). 3. The rising cost of higher education has made it impossible for many families to pay high tuition fees, and as a platform linking up with the university classroom, MOOCs provide more families with learning opportunities in terms of educational cost (Baran, Baraniuk, Oppenheim, Prandoni & Vetterli, 2016).
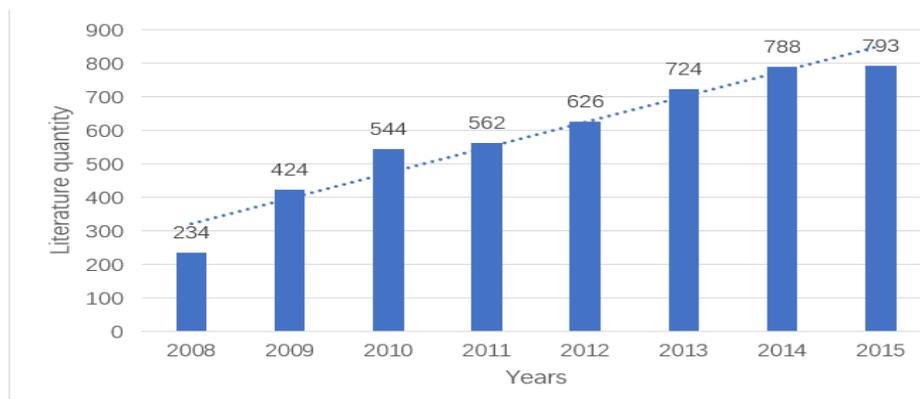


*Figure 1.* Number of published literatures.

**Development Situation of American MOOCs:** The development of MOOCs in the United States: 1. The scales of students, colleges and universities and courses are increasing year by year; 2. The number of participants is increasing, and the number of elite colleges and universities is increasing. Learning platforms are developing from autonomous platforms to off-campus platforms (Paterson *et al.*, 2017). 3. The establishment and mature development of Udacity, Coursera and Edx have laid the foundation for American MOOC education. 4. The social recognition of MOOCs in the United States is increasing, and both the government level and the general public have a higher evaluation of MOOCs.

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## Case Study on the Application of MOOCs in the United States

The case study is based on Vanderbilt University in the United States. Vanderbilt University is one of the few top universities in the South of the United States with excellent teaching quality and scientific research strength. The concurrent network software (POSA) in the university is analyzed for the application of MOOCs.

**Case study of MOOCs**

Since the launch of the POSA program on Coursera, more than 60,000 learners have registered worldwide, varying greatly in age, background, level, etc. The youngest is under 16 years old and the oldest is over 65 years old. Figure 2 shows the distribution of students enrolled in the program.

The figure shows that 46% of the students in the United States are enrolled in this course, followed by 21% in the United Kingdom and 7% in China.

**Introduction to Vanderbilt University's MOOCs**

**Development of MOOCs** First, make a short and concise video to make up the POSA video course. The course is divided into several chapters and each chapter consists of several modules, each of which may take 15-20 minutes, and there will be a small test every five minutes or so in order to improve students' attention. After watching the MOOC video, students may have the dialogue and communication with teachers, which is the best way to deepen their learning. The platform uses discussion boards and webcasts to promote the interactive communication between students and teachers, and the virtual office links such as youtube and Google, which give emphases on the design of interactive links, so that students can get a better learning experience (Sneddon *et al*., 2018).
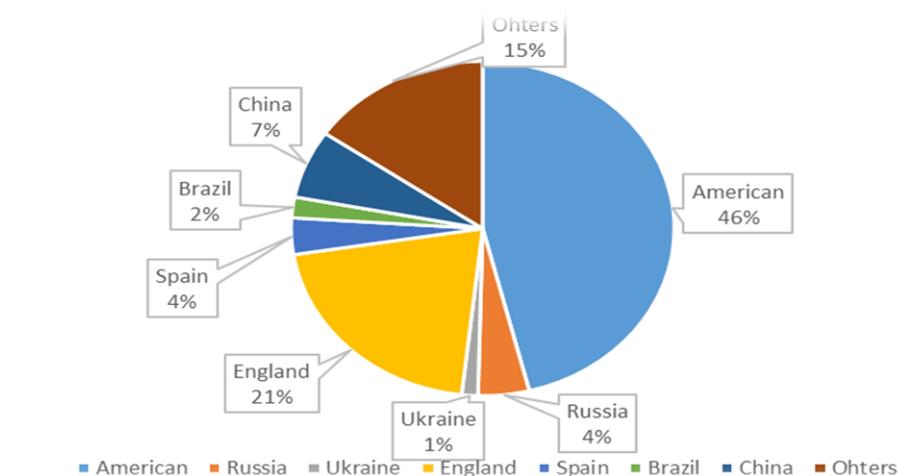


*Figure 2*. The POSA registered student area distribution.

**Management of MOOCs** MOOCs provide students with the learning process, including academic performance, course completion tracking and demonstration opportunities. Supported by platform compatibility and highly adaptable hardware and software, POSA courses are available to learners worldwide through different browsers and on different clients (Abramson, 2013).

**Evaluation of MOOCs** However, it is not feasible to provide individual feedback to thousands of students in MOOCs. Therefore, teachers need more time and energy to design examination questions and establish peer evaluation criteria to make this mechanism clearer and more effective. POSA provides peer review on Coursera platform. Each student is assigned a corrective task, which is correlated with their own score. The score of the assignment is the average of the four learners' scores. In addition, the enthusiasm of learners is enhanced by means of an electronic certificate for course qualification, and more than 4,000 of the 60,000 POSA course enrollees have obtained assessment certificates.

Generally speaking, although Vanderbilt University's MOOCs have difficulty in teaching and need more teachers, the preparation of POSA course provides more detailed learning content and better interactive opportunities for learners.

## Analysis on the Problems of American MOOCs and the Impact of MOOCs

### Problems of American MOOCs at present

Through ten years of development, the American MOOCs face three major problems at present as shown in Table 1.

Table 1
*The Problems Facing by American MOOCs at this Stage*

| Problem | Description |
| --- | --- |
| Low completion rate | Although the number of registered students in the MOOCs is large, the number of students actually learning through the course is small, and the low completion rate has raised doubts about the success of the MOOC platform. |
| Attendance and credits | The credits passed by the MOOC students are not recognized in most universities. |
| Cost and profit | The involvement of enterprises is a hot topic in the development of MOOCs in recent years. The company has a keen sense of the commercial possibilities of MOOCs, provides a technical platform for MOOCs, and promotes the exploration of the profit model of MOOCs. |

### Impact of MOOCs on American Higher Education

**Actual impact:** The development of American MOOCs has a revolutionary impact on American higher education. With the large-scale, openness, low-cost and easy-to-obtain way, it has changed people's cognition and learning of high-quality courses in institutions of higher learning, and provides more learning opportunities for ordinary learners. The development of MOOCs in the United States and its global spread also lay the leading

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foundation of American higher education in the world and play a positive role in promoting the development of American higher education.

**Theoretical impact:** MOOCs not only bring challenges to higher education, but also provide guidance for the theoretical reform of traditional education in higher education, and promote the exploration of new teaching mode in colleges and universities.

## Conclusion

MOOCs have attracted widespread attention and research on a global scale. This paper summarizes the development status of MOOCs in the United States, introduces the application of MOOCs in American colleges and universities with practical cases, and summarizes the problems in the development of MOOCs and its impact on American higher education. The main conclusions are as follows:

MOOCs have been widely used in American colleges and universities, and also have a large number of learners in the global scope, with a considerable development prospect.

MOOCs have a revolutionary impact on American higher education, two of which promote each other and promote the mutual development.

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