Research Article

Education Management Method Based on MOOC Analysis Platform [*]

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Abstract

Now education management methods are changing people's perceptions, which have a major impact on the development of education. The traditional education method has the problem of incomprehensive management. To this end, an education management method based on MOOC analysis platform was proposed in this paper. Massive open online course (MOOC) analysis platform was introduced to design education management system, and realize education management. Besides, by relying on education management system, online open classroom was embedded to realize education management. The experimental data shows that the proposed education management method based on MOOC analysis platform is more comprehensive than the traditional education management method. It's suitable for modern education management.

Keywords

Computer Technology • MOOC Analysis Platform • Research on Education Management.

As a new online education method, massive open online course (MOOC) has been entering the current education management. With the help of the Internet and computer industry, it has a very big impact on online learning and higher education methods (Huang, Zhou, & Wang, 2017). MOOC has three characteristics: massive, online and open. The "massive" is mainly reflected in the number of students, which in the traditional course is only a few dozen or a few hundred, but in the MOOC, it will reach hundreds or even tens of thousands. "Online" refers to the completion of learning content online, without being limited by time and space. "Open" refers to the opening of courses to all learners. As long as online conditions are available, learners around the world can choose the courses they want to study.

Education management method based on MOOC analysis platform

Education management methods occupy a very important position in the field of teaching theory and practice. In our current teaching system, the education management methods are understood in a very narrow sense. It can be accurately defined as: certain activities composed of a set of methods to complete the teaching content and achieve the teaching purpose with the interaction between teachers and students by the use of teaching means under the guidance of the teaching principles.

The education management method has certain independence. It plays a very important role in teaching content, teaching tasks and teaching purposes in form. Most people think that using different education management methods will have different impact on teaching effects in the same teaching content and teaching tasks. Because of the independence of education management methods and its own significance, it occupies a key role in teaching activities. Also, due to its independence, the reform in the education management method can be easily made, without changing the curriculum and teaching organization form.

Introduction of MOOC

MOOC is known as Massive Open Online Course. MOOC is defined in Wikipedia as "an online course aimed at unlimited participation and open access via the web".

Table 1
MOOC Education Management Stages

Stage 1	Upload the basic learning materials and learning progress on the webpage so that students can access the information at any time
Stage 2	Use online information for processing and face-to-face construction of knowledge
Stage 3	After the two processes of online learning and face-to-face processing, students and students, students and teachers are interacted to complete some of the learning results, evaluation of the problem and feedback.
Stage 4	A learning group is formed between students and teachers to discuss and share learning experiences. They usually communicate via email and other network ways to form an online learning community.

In MOOC, "massive" means the large-scale characteristics of MOOC. It here refers to both the number of registrar's, and the richness of curriculum resources; the "open" represents its opening characteristics; the students can register for the courses that they are interested in; for the "online" characteristics of MOOC, MOOC learning process is completed via the Internet, including the teacher teaching, student learning, teachers and students/students interacting, homework completing, and the work correction; "course" means the content

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provided by MOOC is a complete course, which is a major advancement of MOOC over open educational resources. The MOOC education management stages are shown in Table 1.

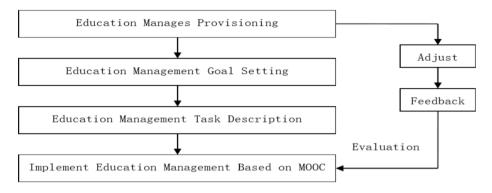The MOOC-based education management flow chart is shown in Figure 1.

Figure 1. MOOC-based education management flow chart

Open education resources can provide many excellent resources, but, due to the lack of teachers' guidance and peers' mutual help, many people's learning process is incomplete, and excellent educational resources are not fully utilized. MOOCs arise in the form of courses, with specific opening and closing time, which can greatly improve the completion rate and the use value of excellent educational resources (Xu & Wei, 2017).
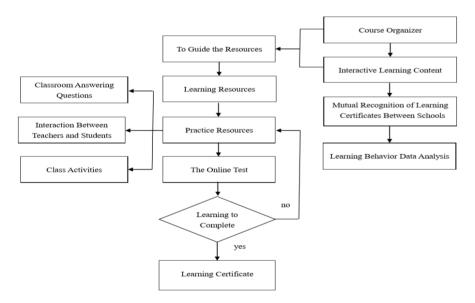
Education management system design

Figure 2. Education Management System

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The education management system provides related guidance resources, learning resources and practice resources for student learning. Through the education management system, students are required to watch the course videos independently, complete the embedded test and after-school test questions in the course video, and participate in the online discussion in the course discussion area until they fully grasp the basic knowledge and basic principles of the course, as well as complete the study of the theoretical knowledge. As an important supplement to the education management system, the offline classroom teaching platform bears the important task of strengthening, systematically sorting out, deepening, and exploratively innovating the content of education management (Wang, 2017). In the classroom teaching activities, the teacher no longer serves as the knowledge transmitter, but goes into the students to answer questions and solve problems, and carry out various activities such as keynote speech, independent discussion, group debate, scenario simulation, etc., so as to provide help for the completion of students' theoretical knowledge and the improvement of their comprehensive quality. Fig.2 shows the education management system.

The education management system provides relevant information resources and information services for teaching, including a comprehensive online learning support service system, a library innovation service system and a learning analysis support system based on big data, which not only provides students with personalized learning support, enhance their curriculum learning experience, but also the teachers with a wealth of teaching resources. It also provides the education managers with a summary of student learning data to develop a more scientific and rational education management plan.

Diversification of education management

In the traditional education management, the teacher is a single subject, and the teacher/student has the relationship between evaluator and evaluate, so that the teacher is the embodiment of authority, and the students passively accept the evaluation. The evaluation of the teacher as a single subject can easily obliterate the students' enthusiasm for learning, and even cause their reverse psychology, while the teachers will inevitably be one-sided and subjective in the evaluation process, which shall make the evaluation worthless (Zhang, & Wang, 2017). However, in the education management based on MOOC analysis platform, the teacher's main evaluation, student's self-evaluation, peer evaluation and machine automatic evaluation technology are combined together to achieve diversification of evaluation subjects, which can not only ensure the objective and fair evaluation of courses, improve the effectiveness of evaluation, but can also enable students to actively participate in the classroom evaluation through student self-evaluation and peer review, so that students can confirm their own subject status while learning. The student's self-evaluation process is not only that of students' active participation, but also of self-reflection, self-education and self-improvement. Students can fully understand themselves in self-evaluation, improve their self-consciousness, develop self-reflective habits and improve their ability to learn independently.

On the MOOC online analysis platform, teachers can also provide accurate answers and detailed explanations when preparing test questions by using the machine automatic review technology, and then students can get feedback automatically given by the computer after completing the test questions. But in the traditional classroom, students often have to wait a day or two, even a week to see the right or wrong feedback

of their own questions. The efficient and timely feedback from the automatic machine review technology allows students to know where they are wrong and immediately correct them, greatly enhancing the learning effect.

Comprehensiveness of education management

Education management is divided into the following three stages: imparting knowledge, guiding students to turn knowledge into ideal beliefs, and encouraging students to turn theoretical knowledge and ideals into practical actions. Therefore, the assessment of the course should include: the degree of students' knowledge acquisition, the degree of students' ability to enhance, the degree of student identification value, and the degree of student practice theory. In the previous curriculum assessment, it focused on the basic knowledge and basic theory, which was limited to the cognitive field of students. Now for the education management based on the MOOC (Yuan, & Liu, 2017) analysis platform, the assessment content of the course is more comprehensive. In addition to examining the theoretical knowledge acquired by the students, it also needs to assess the students' emotions and attitudes through the students' classroom performance, such as attendance, participation and enthusiasm in class discussion etc., examine the students' comprehensive ability by analysing the cases, papers, reports, etc., and assess the students' ideological ethics and theoretical practice according to the students' usual behaviours. Thus, it can achieve the transformation of the evaluation content from "cognitive", "test-oriented" to "capable" and "quality" education finally (Chen, 2017).

Diversification of education management

The traditional evaluation method of curriculum is a kind of resultant evaluation. The resultant evaluation refers to the comprehensive evaluation for the final effect of the course teaching and the achievement of the course objectives at the end of one teaching period, such as one semester and one academic year. This "final" method does not meet the requirements for students' all-round development, easily resulting in test-oriented learning purpose of students.

Table 2 shows the comparison between the MOOC-based education management methods and traditional education management methods.

Table 2
Comparison between MOOC-based and traditional Education Management Methods

	MOOC	Traditional education management
Teaching concept	Learner-centred	Teacher-dominated
Curriculum organization	Learners can participate in the course teaching only if they register and sign up in advance	The uploaded teaching resources can be accessed at any time
Curriculum resource	A variety of resources	Less resources
Teaching evaluation	Systematic evaluation, peer review, teacher review, learner self-assessment	Only self-assessment

The MOOC-based education management makes observation and evaluation of the students' whole learning process, which is the process evaluation urgently needed for the course. The process evaluation means for the teachers to evaluate all kinds of information in the whole learning process of the learners. It indicates that the teacher can immediately understand the dynamics of the students throughout the learning process, master all kinds of information, and give timely evaluation and feedback, so that the teacher can improve the teaching method, adjust the teaching methods and thus add values to teaching. According to the process evaluation, the

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whole process of students' online and offline learning should be evaluated. Taking online learning as an example, teachers use technical means to understand the progress of students' learning, promptly supervise the substandard progress of learning, and timely examine the students' learning outcomes by the chapter test and homework (Li, 2017). The purpose of process evaluation is to continuously focus on the students' learning progress, keep abreast of their learning status, evaluate their learning level in time, and solve their learning doubts in a timely manner. Only by combining the process evaluation with the resultant evaluation can it adapt to the "value orientation" of the curriculum and overcome the shortcomings of valuing final-exam over daily learning behaviour in the traditional evaluation method.

Education management model design

In this paper, an education management model was designed to constrain the investment in the early stage of education decision-making management. The educational decisions were set to be neutral risks, with the goal of maximizing education management capabilities. Therefore, at the set management probability (P), the conditions for education management to promote investment in education are given as:

$$-C + \left(1 - P\right)\omega \text{h} + P\omega^{*}\text{h} > \omega \tag{1}$$

where: C is the input options in the education process; ω is the generalization ability of education; h is the optimal capital input. The existing research proves that the education control rate is low in places with low capital investment, and also there are certain management problems brought about by educational migration. The education management ability (higher education cost) is higher in areas with higher capital investment. In this paper, the relationship between the capital investment area and the education management ability was be obtained according to the formula. The rising probability of education management can increase the return brought by investment and change the education level and economic structure of the area; as the probability of education management increases, the level of education will also increase. It's expressed as:

$$\frac{\partial^2 H}{\partial \text{p}} = \text{hg}\left(C_{\text{p}}\right)\left(\omega^{*} - \omega\right) > 0 \tag{2}$$

where: H is the probability of an increase; C_{p} is an inevitable event for an increase in the level of education; ω^{*} is the generalized area already covered. Similarly, the factors affecting the educational level can also be sorted as $H_{\text{p}} = (1-p)H_{\text{a}}/(1-pH_{\text{a}})$. Bringing into the above formula, it's calculated as:

$$\frac{\partial^2 H_{\text{p}}}{\partial \text{p}} = \frac{(1\text{-p})\partial H_{\text{a}} / \partial \text{p} - H_{\text{a}}\left(1\text{-}H_{\text{a}}\right)}{\left(1\text{-p}H_{\text{a}}\right)^2} \tag{3}$$

In general, it is difficult to judge whether the level of education management has a migration impact on education through the calculation. In order to solve the constraint problem of education management, each stage of education management was sub-divided into two phases in this study: in phase 1, setting the corresponding education level to the minimum educational management efficiency, it's judged whether comprehensive education can be realized; if comprehensive education is realized, the cost of payment is calibrated as the best

cost, and the efficiency of education management is the best. In phase 2, the reverse setting is made; the education management probability of comprehensive education is set to P, and the educational management probability won't change in the control range under the influence of capital investment; thus, the educational management probability P is the best education management probability.

In order to prevent the education management being constrained excessively, it's assumed that the minimum level of the educational process is basic education in this educational management model. The management of this investment must be set by the best value of the first phase. Therefore, if the education level in a region is already known, the education management process must meet the following two conditions:

$$c < c_p \equiv \omega_1(h-1) + ph(\omega^* - \omega) \tag{4}$$

$$c < c_f \equiv \omega - \mu \tag{5}$$

Thus, at $\omega - \mu < \omega_1(h-1) + ph(\omega^* - \omega)$, the constraints on education management are binding on the level of education. In steady state conditions, the constraints of education management are equivalent to:

$$\mu > \omega(2-h) + ph(\omega^* - \omega) \tag{6}$$

Increasing the education level will have an impact on the probability of local education management. Excessive education level will greatly limit the ability of education management. Regardless of the constraints of education level, the first influencing factor is mainly the investment of funds, but with the investment of funds increasing to utmost level, its ability to influence education management will decline. So far, the education management model design is completed.

Model setting and test analysis

The multivariate logit model was applied to estimate the impact of the education management comprehensiveness on the MOOC-based education management method. Based on the experience of previous research and the purpose of this study, the following explanatory variables were used, namely, dummy variables for whether they have received school education, in which "1" indicates that they have received school education, and "0" indicates not receiving school education; variables of management method and the dummy variables for the degree of adaptation T, including T1 (the students' adaptedness to the education management method based on the MOOC analysis platform), and T2 (the adaptedness to the traditional education management method). In the analysis process, the two different education management methods were used to analyse the comprehensiveness of education management and the adaptedness of the two methods. In order to ensure the accuracy of data processing, only the learning state of different students, as well as their respective adaptability, were tested after learning, to obtain the test results. The students' adaptedness to the two methods were divided into three levels: more adaptive, general, and less adaptive. The adaptedness is shown in Table 3.

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Table 3
Students' Adaptedness to Two Methods

Adaptedness	MOOC-based method	Traditional method
More	89.7%	68.5%
General	7.2%	22.3%
Less	3.1%	9.2%

According to the results of multivariate logit model, 89.7% of the students were more adaptive to the education management method based on MOOC analysis platform, 3.1% students were not; 68.5% were more adaptive to the traditional methods, and 9.2% of the students were not suitable adaptive.

In order to ensure the effectiveness of the education management method based on MOOC analysis platform proposed in this paper, experimental analysis was carried out. Students were used as test subjects in both the adaptiveness test and comprehensive tests on education management. In view of the test validity, we randomly selected 50 students from different classes to conduct tests. From the aspect of teaching methods, several experiments were conducted to study the comprehensiveness of the two methods in education management. The results are shown in Fig.3.
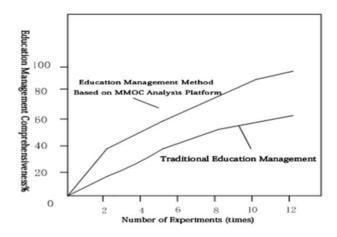

Figure 3. Comprehensiveness of teaching management

It can be seen from the figure that the MOOC-based education management method is more comprehensive in teaching methods than the traditional education management method.

Conclusion

Compared with the traditional education management method, in the MOOC-based education management method, students are more active and active in learning, and classroom teaching is more targeted, enhancing the

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students/students, and students/teacher interaction and communication, and resulting in easier and more enjoyable teaching atmosphere in the classroom. However, there have also exist many problems in this education management method, e.g., how to ensure the students' self-learning effect, how to ensure the students' online test results are true and effective, etc., which requires further research in future.

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