Exploration on MOOC Teaching Pilot College Construction Planning

Ce Zhang*, Dianhui Chu, Zhenzhou Ji, Songlin Gu

Abstract: The spread and innovative application of MOOC in China has rapidly triggered a profound revolution in the curriculum construction and teaching reform of universities, promoting significant results in teaching and talent cultivation. Based on the practice of "MOOC teaching pilot colleges" carried out by the China University Computer Education MOOC Consortium in some universities in China, this paper proposes the overall plan of MOOC teaching pilot colleges construction through the analysis of typical cases, pointing out the purpose and significance of the reform of the pilot college and giving the relevant concepts and requirements. This thesis focuses on the reform of teaching methods, assessment methods, grade calculation and credit recognition, and stress assessment, emphasizing the need for a three-dimensional process management of teachers, students, and college teaching administrators, and the need to focus on institutional development to provide protection. MOOC teaching pilot colleges should reform and innovate in practice, and they should keep solving the problems they encounter and deepen the reform, so as to provide useful experiences and reference practices for the landing and high-quality development of MOOC teaching in more universities.

Key words: MOOC; pilot college; construction planning; teaching reform; institutional protection

1 Introduction

Massive online open courses represented by MOOC have rapidly emerged worldwide[1-2], promoting the deep integration of information technology and education teaching[3] and bringing significant opportunities for the transformation of higher education teaching and learning in China. After years of development, MOOC with distinctive Chinese characteristics has promoted the changes of teaching philosophy, teaching methods, teaching technologies, teaching approaches and teaching modes, and provided a solid impetus for the reform of teaching and talent cultivation in Chinese universities.

Driven by the construction upsurge of "twenty thousand Plan"[4] and "Golden Course"[5] in the first-class curriculum construction of the Ministry of Education, the MOOC resources are being used to carry out teaching reforms including online and offline hybrid teaching, to create MOOC teaching suitable for their own reality, and to effectively improve students' learning performance and innovation ability through the dual improvement of teachers' teaching quality and

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students' learning effectiveness, which is triggering universities to carry out more in-depth reforms.

The School of Computer Science and Technology of Harbin Institute of Technology (Weihai) became the first batch of MOOC teaching reform pilot colleges of the China University Computer Education MOOC Consortium (CMOOC Consortium) in 2016, and has carried out MOOC-based hybrid teaching reform for several teaching cycles for many years and achieved positive results. Based on this, this paper summarizes and condenses its reform process, typical practices, and successful experiences, and combines the accumulation of previous research work[6-8] to form a preliminary overall plan for the unified MOOC-based teaching reform at the college level, which will bring reference for more colleges to carry out hybrid teaching reform.

2   Purpose and Meaning

The purpose of building MOOC teaching pilot colleges is to make full use of MOOC high-quality teaching resources, update teaching contents, optimize teaching design, innovate teaching methods, bring into play the integration effect of "student-centered" online teaching and offline teaching, promote teaching and learning revolution, promote the development of intelligent teaching, actively explore new channels for MOOC to land in universities and directly serve teachers' curriculum teaching and talent training reform, form a number of typical teaching cases and matching policies for teaching management reform, and promote the role of information-based teaching in teaching reform and teaching quality improvement.

Carrying out the construction of MOOC teaching pilot colleges and focusing on exploring the teaching reform with online and offline hybrid teaching as the core is an important attempt to systematically promote MOOC teaching, which will play an important role in effectively and practically promoting the application of quality online open course resources represented by MOOC in the teaching of more colleges and universities.

With the pilot college as a strong grip, it is of great significance for the time to continuously enrich high-quality teaching resources, reshape the teaching process, reform the teaching mode, innovate the education form and deepen the reform of the teaching system and mechanism, and will play a vital role as a model for early and pilot implementation.

3   Basic Concepts and Basic Requirements

3.1   Basic concepts

(1) MOOC Teaching Pilot College. Teaching units (faculties and departments) within universities carry out MOOC-based teaching under the constraints of meeting certain basic requirements.

(2) MOOC-based teaching and learning. It refers to the application of MOOC to the teaching of courses for school students, and students will receive course credits after passing the course and being assessed. It includes pure online MOOC teaching, a variety of hybrid teaching based on MOOC, and other methods, etc.

(3) Credit course. It refers to the MOOC used to serve the teaching of the campus courses on the MOOC platform identified by the MOOC teaching pilot college, and students get the corresponding course credits after learning online and passing the MOOC assessment or offline assessment.

3.2   Basic requirements

(1) Course type and number. For computer science majors, MOOC-based teaching should be carried out for at least four courses, including no less than two professional core courses, and the number of learners in each course is usually not less than 30.

(2) Pilot cycle requirements. Take the academic year semester as the unit, at least three rounds and above continuously to form a stable teaching model.

(3) Faculty participation requirements. Establish a stable teaching team for each course, with a ratio of no less than 1:2:1 of responsible teachers, lead teachers and teaching assistants (non-teaching assistants), and a clear division of tasks; in particular, there should be a special teacher to organize and carry out online MOOC

teaching, and be responsible for the management of course announcements, content release, interaction and Q&A, tests, assignments and examinations, ensuring the normal and orderly operation of online teaching order.

(4) Student participation requirements. Current students should all take the course and participate in online independent and collaborative learning, complete the learning tasks of each part of MOOC/SPOC according to the requirements of the instructor, and spend no less than 120% of the total video time of the course studying on average online (including video learning, discussion, quizzes, assignments, exams, etc.).

4 Teaching Reform

4.1 Teaching method reform

The curriculum teaching team should re-design the curriculum, give full play to the epochal role of the curriculum ideology cultivating people and souls, pay attention to the establishment of a new student-centered relationship between teaching and learning, carry out multiple rounds of mixed teaching practice, and organize data and summarize experience regularly, and finally complete the exploration of new teaching models.

The curriculum teaching team should carry out MOOC-based mixed teaching practice based on reconstructed teaching design, focusing on exploring the organic combination of online and offline teaching and effectively promoting the reform of teaching methods, especially the bold attempt to carry out flipping in physical classroom teaching, innovating and enriching the forms and essentials of the classroom teaching method, and effectively integrating heuristic, seminar, inquiry, participatory, case-based and other teaching methods, summing up experience in time, analyzing results regularly, and continuously forming unique Cases of mixed teaching reform.

4.2 Reform of assessment methods

In terms of course performance management, we explored standardized online and offline mixed

teaching and examination reforms. The proportion of online grades adopts a multi-segment accumulation method. Students are reminded to take tests, assignments, discussions, examinations and other links on time. Flipped classroom results are highlighted in offline grades. This online and offline evaluation method ensures that a higher percentage of students receive course credits, and promotes active learners who are willing to learn and explore learning spirit to obtain better grades. Fig.1 shows the composition of this multi-process phased accumulative assessment.
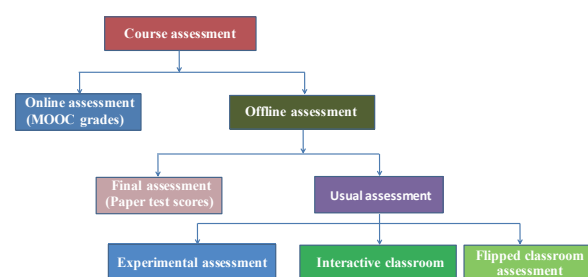

Fig.1 Multi-process phased accumulative assessment.

(1) Online assessment and results: Relying on the MOOC platform, students are reminded to watch videos, take tests, homework, discussions, examinations and other links on time, and the MOOC platform automatically calculates their scores.

(2) Offline assessment includes usual assessment and final written examination assessment: The usual assessment includes three sub-processes, namely, the interactive link in offline classroom teaching and the two sub-processes of flipped classroom, and the experiment and final written examination are conducted in the traditional way of answering papers.

Each sub-process assessment must pay more attention to the assessment of students' learning level, ability, and innovation, and put emphasis on the implementation of quality education in the first place.

4.3 Academic performance evaluation and credit recognition

In terms of course performance management, we explored a standardized online and offline hybrid teaching multi-source performance structure mechanism. The online performance adopts a multi-

segment accumulation method to highlight tests, assignments, discussions, examinations and other links, and the offline grades highlight the flipped classroom results.

Typically, driven by the "MOOC + SPOC + flipped classroom" teaching model, the total course scores more naturally tend to be obtained in multiple stages and accumulatively. Table 1 gives an evaluation method for the grades of a course with multiple links online, offline and experimental.

Table 1　Course Score Calculation Method

Grade composition	Subitems included	Percentage / %	Key points
Final written exam	Final written exam 60%	60	Try to avoid duplication with MOOC online exam content
Usual homework	Homework 5% Flipped classroom 10%	15	Try to consider the relevance to class discussions and quizzes Preparation, display, and interaction
MOOC/SPOC	① Watch videos, assignments, tests, interactive discussions, etc. ② Online exams, etc.	15	MOOC platform automatically obtains results
Curriculum Practice	Computer room experiment	10	Experimental score + report score

4.4　Stress assessment

Carrying out MOOC-based teaching is in line with the contemporary nature of students acquiring knowledge, improving the learning environment and learning experience, shaping a new relationship between teaching and learning, enhancing the interaction of students participating in classroom teaching, and improving independent learning ability, innovation ability, research and inquiry ability. However, compared with traditional teaching, it brings increased time and energy for both teachers and students.

(1) Teacher teaching pressure——As a teacher who develops MOOC/SPOC/flipped classroom teaching, he needs to organize and provide services for online teaching, complete the teaching design that is compatible with online teaching, and organize classroom teaching, especially flipped classroom teaching.

Teachers' online and offline hybrid teaching is not only an excessive physical effort, but also a lot of effort in redesigning the teaching content. This kind of effort must be pressure assessed to ensure continuous progress.

(2) Student learning pressure——as a student who accepts and participates in the above process, compared with the previous single classroom learning, it has added tasks such as online learning links, preparation for flipped classrooms after class, presentation and explanation in class, and participation in discussions.

Students are exposed to high-quality curriculum resources through online learning, which improves the quality of curriculum content learning. After class, flipped classrooms improve the ability and effectiveness of innovative learning. However, students in the new era are faced with a large number of tasks in other courses, experiments, curriculum design, student clubs, science and technology competition, innovation and entrepreneurship and so on. This kind of effort must be pressure assessed to ensure that it continues. It is recommended that colleges and universities with conditions can explore the education of people through the academy system.

To carry out this new teaching model on a large scale, it is necessary to conduct in-depth research and consideration in the distribution of class hours, teacher workload calculation, student learning efforts (including online and offline parts), test design and score calculation and other aspects, and establish a guarantee mechanism for long-term MOOC-based teaching in both teaching and learning, and gradually develop

effective strategies to implement it.

5 Process Management

5.1 Teacher-side process management

The era of network changing teaching has come, and teaching based on MOOC/SPOC/flipped classroom is an inevitable requirement for colleges and universities in the "Internet +" era.

(1) Teachers should actively adapt and take the initiative, introduce high-quality online teaching resources into their own teaching, innovate implementation forms, and improve teaching effects.

(2) Teachers should guide students to gradually adapt to the online learning environment, organize online teaching, help students master online learning technology, and promote the deep integration of online teaching and physical classroom teaching.

(3) Teachers should carry out mixed teaching design, use MOOC resources to carry out online teaching, and implement characteristic teaching in offline physical classrooms based on reconstructed content.

(4) Teachers should make full use of online teaching environment and resources, open up online classroom teaching, make full use of offline teaching environment and resources including smart classrooms, and develop participatory and interactive physical classroom teaching with flipped classrooms as innovations reform.

(5) Teachers should establish effective communication channels with teachers in charge of MOOC, and conduct timely exchanges on course content and services.

5.2 Student-side process management

Students should actively adapt to the development needs of the times, learn to use the MOOC platform for autonomous and collaborative online learning, expand the learning space, and achieve personalized learning with a custom rhythm.

Students must earnestly complete the online learning requirements of the teacher and the MOOC platform, and complete the online learning tasks.

(1) Students should make full use of the online learning environment and resources, offline teaching environment and resources including smart classrooms, to improve self-learning ability, problem solving ability and innovation ability.

(2) Students should actively cooperate with the teacher's teaching reform, and make preparations, interactive participation, and improvement in all aspects of pre-class preview, in-class learning, and after-class summary.

5.3 College teaching management staff-side management

(1) The college must have specialized educational management personnel (Teaching secretary and other personnel) responsible for the process management based on MOOC teaching.

(2) Cooperate with teachers to do a good job in the organization and docking with the school's teaching department (the Academic Affairs Office), and do the docking work with the MOOC platform from course selection to course completion.

(3) Do a good job in teaching organization and management, and gradually form a standardized and orderly MOOC teaching-based whole-process organization, including the management of personnel (teachers, students, etc.), processes, and mechanisms.

(4) To do a good job of coordinating work among teachers, colleges, school teaching management departments, MOOC platforms, and students.

6 System Guarantee

In order to ensure the healthy, orderly and standardized development of MOOC teaching, it is necessary to do a good job of adaptation and guarantee support at the institutional level, including necessary conditions in policy, mechanism, organization, funding, evaluation and other aspects, and promote innovation in university teaching management mechanism and policy of MOOC teaching.

The Ministry of Education's Opinions on Strengthening the Construction, Application and Management of Online Open Courses in Colleges and

Universities (Jiaogao [2015] No.3) clearly requires that "the management, incentive and evaluation mechanism of teaching and learning of online open courses should be established according to the actual situation of our school".

6.1 Policy guarantee

The college should issue policy documents of MOOC teaching pilot colleges based on its own realities, solidify them in the form of college documents, directly guide and effectively manage MOOC-based teaching, and ensure that "there are laws to follow".

In particular, it is necessary to formulate documents on incentive policies. In the existing policy documents, such as the Implementation Measures of College Teachers' Position Classification Setting, the Measures of College Performance Assessment and Post Allowance Payment, and the College Post Appoint, etc. The provisions related to MOOC construction and application should be added to stimulate teachers to change their teaching concepts and adopt MOOC/SPOC teaching methods.

6.2 Mechanism guarantee

(1) Innovate mechanism according to local conditions: Restructuring course teaching design should be carried out in combination with the reality of the major, and gradually exploring the reform of blended teaching mode and physical classroom teaching method suitable for oneself.

(2) Continuous improvement and innovation mechanism: adopt the strategy of "progressive advancement and repeated iteration" to implement the teaching mode including "MOOC+SPOC+ Flipped Classroom", gradually increase reform efforts in flipped classroom teaching, accumulate experience, and steadily carry out a higher degree of flipped teaching.

(3) Problem analysis and innovation mechanism: for the courses and teachers with low teaching evaluation for several consecutive times, we should find out the reasons, make accurate mistakes, and effectively help and improve them.

At the end of the pilot cycle, problems should be sorted out, data statistics should be made, and results should be analyzed. At least one pilot summary report should be submitted.

6.3 Organizational guarantee

In order to meet the needs of MOOC teaching, the school should establish an effective organizational guarantee, establish an organizational system to promote the construction and application of MOOC, and establish a three-level management structure: MOOC teaching leading group, MOOC teaching guidance working group and course group, to promote, guide and implement the teaching and reform of MOOC-based courses.

The leading group will identify and guide the MOOC teaching teachers, and focus on the implementation and evaluation of the teaching quality of MOOC.

The college should establish a corresponding guiding body (working group or committee) to check the course teaching plan of mixed teaching and carry out teaching guidance and supervision on a regular basis.

6.4 Reward and incentive guarantee

We will create favorable investment conditions, provide incentives and incentives to motivate teachers to explore the multi-mode application of MOOC in course teaching, encourage teachers to carry out MOOC teaching and practice, promote curriculum reform and upgrading of teaching reform, and improve teaching quality and learning effectiveness.

Establish supportive incentive mechanisms and policies for teachers' efforts, formulate MOOC/SPOC teaching incentive mechanisms and policies, and give preferential treatment to MOOC/SPOC teachers in terms of total work accounting, teaching excellence awards, special subsidies, project approval support, teaching post appointment, professional title promotion and other aspects.

The following are a number of incentives to reward.

(1) In terms of teaching workload accounting, a work payment method for compensating teachers for MOOC teaching is established, as shown in Table 2.

The above accounting process will be determined by the MOOC teaching leadership group or the school's

Table 2　The weights of MOOC teaching workload

Class types	Weight coefficient
Self–built MOOCs (open)	3* corresponding course coefficient (1st year) 2.0* corresponding course coefficient (2nd year) 1.5* corresponding course coefficient (3rd year and beyond)
Standalone (asynchronous) SPOC (not open)	2* corresponding course coefficient (1st year) 1.5* corresponding course coefficient (2nd year) 1.3* corresponding course coefficient (3rd year and beyond)
Synchronous SPOC	1.5* corresponding course coefficient (1st year) 1.3* corresponding course coefficient (2nd year) 1.2* corresponding course coefficient (3rd year and beyond)

teaching steering committee and will be made public to the whole school.

(2) Commend MOOC-based teaching, set up teaching excellence awards, and commend teachers who carry out MOOC-based teaching and get B or above in the comprehensive evaluation.

(3) Establish special allowance and reward for excellent teaching of MOOC teachers, which will be distributed to teachers who carry out MOOC teaching and are welcomed by students and meet the requirements of teaching quality evaluation.

(4) In the "College Performance Assessment and Post Allowance Payment Method", establish an excellent/ high-quality MOOC recognition mechanism: For MOOC/SPOC constructed by teachers of the school, if it is identified as national excellent course (open video course, resource-sharing course, online open course), provincial excellent course/excellent course, and university-level excellent course, the corresponding teaching performance score will be given (as teaching achievement).

(5) In the "Implementation Measures for College Teachers' Position Classification", establish the identification mechanism of job responsibilities and conditions: For the persons in charge of the above three courses (including important participants) and the outstanding persons in charge of MOOC (including important participants) recognized by major MOOC alliances in China, corresponding levels of recognition shall be given in the job responsibilities and conditions.

(6) Actively strive for project support in teaching reform, teaching research, curriculum construction and other aspects at the school level, and give priority to projects closely related to MOOC teaching in the school's teaching reform project.

(7) Actively strive for special funds from schools for MOOC teaching guarantee.

6.5　Evaluation guarantee

To carry out directional and quantitative evaluation, establish scientific, reasonable, objective and effective evaluation standards, implement new measures that are different from the traditional classroom teaching evaluation, and carry out accurate evaluation at observation points and evaluation points.

It is necessary to make regular evaluation, form historical evaluation data, carry out necessary statistical analysis, accumulate experience, find out the shortcomings, and gradually establish the closed-loop quality assurance system of "teaching evaluation feedback improvement".

7　Conclusion

MOOC based teaching in college is a new thing, needs problem oriented, focusing on the teaching mode and teaching method reform and innovation, to the quality of teaching and learning effect to improve as the goal, through the construction of system security, adhere to the principle of continuous improvement and improve, continue to deepen reform of the informationization teaching process. Pilot colleges and curriculum teaching teams need the courage to reform the teaching idea, teaching mode, teaching method, teaching techniques, teaching means, teaching methods and bold exploration, take an active part in pilot CMOOC union related training and exchange activities, constantly enhance the level of teaching reform based on the MOOC, ability and quality.

Acknowledgement

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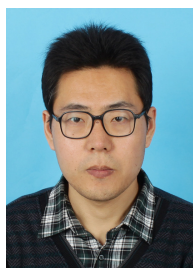
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