Research on Objective-Oriented MOOC Course Design

To cite this article: Yan Sun 2019 J. Phys.: Conf. Ser. 1288 012069

View the article online for updates and enhancements.
Research on Objective-Oriented MOOC Course Design

Yan Sun
Associate Professor, Marxist College, Hubei Institute of Fine Arts, Canglong Island, Jiangxia District, Wuhan, China.
Email: sunyan771225@163.com.

Abstract. In order to realize the effective use of MOOC, we must start from the teaching objectives of MOOC course and study the course design of MOOC, that is, to design MOOC course based on the objectives. This paper puts forward a Objective-oriented MOOC course design framework model, and discusses the principles of MOOC course design, content selection and organization, and design of learning evaluation.

1. Introduction
MOOC (Massive Open Online Courses) is a new type of online course mode which has emerged in recent years. In essence, it provides a complete teaching mode similar to traditional education, which has a pre-designed course schedule. Instead of classroom instruction, it carefully designs and produces micro-videos, equipped with systematic course assessment requirements and provided with performance certificates. As an informational course teaching mode under the background of new technology, MOOC has obvious advantages: easy to use, low cost, the vast majority of free, wide coverage, self-learning and rich learning resources etc.[1] Because of these, MOOCs have attracted unprecedented attention from the educational circles, and even some people have proposed to use MOOCs to subvert traditional education.

Recognizing the powerful influence of MOOCs, we should also be aware of its shortcomings. At present, there are obsolete educational concepts and single teaching mode in MOOCs; although most MOOCs have astonishing registers, the number of people who really finish the course is relatively low. In addition, large-scale also means that a large investment is needed: on the one hand, MOOC platform needs to invest a huge amount of money; on the other hand, MOOC teachers need to spend a lot of time and energy in the production and management of courses. Therefore, how to realize the effective use of MOOC will inevitably become a problem that needs to be seriously studied and solved in the further development of MOOC.

This paper carries out the objective-oriented research on MOOC course design, and provides a scientific MOOC course design model, so that the MOOC developed according to this model can be effectively utilized.

2. Objective-oriented MOOC Course Design Framework Model

2.1. The Meaning of Course Design
Any complex thing needs to be designed before it can be implemented. Course design is a bridge between course theory and course practice. Allan C. Ornstein believes that course design is to arrange the elements of course, including objectives, subject knowledge, learning experience and evaluation, into a practical and operational whole process. Among them, subject knowledge and learning experience are the contents of the course, and the course materials chosen according to the course
objectives, while the objects of evaluation are the course objectives, course contents and the conformity between them.

Course objectives can be divided into two categories: cognitive objectives and expressive objectives. Cognitive objective is related to learning theory of cognitivism, and it is the subject knowledge which needs to be understood and remembered. The advantage of cognitive objective is that it is operable, easy to arrange learning activities and to evaluate learning outcome. However, the disadvantage is also obvious, that it ignores more complex advanced psychological activities, such as problem solving ability, emotional attitude and so on. The expressive objective was first proposed by American course theorist E.W.Eisner, which does not deny the rationality of cognitive objective, but takes expressive objective as a supplement. Expressive objective is related to learning theory of constructivism, which includes not only student's ability to analyse and solve teaching problems, but also student's individualized and original response in the process of learning activities. The expressive objective is to enable students to participate in well-designed situated learning activities (i.e. learning experience), which can be evaluated through lecture, project design, writing report, experimental operation, and exhibition of work.

Course content includes subject knowledge and learning experience. Subject knowledge can usually be divided into different disciplines according to the subject field. For example, China divides subject knowledge into 12 first-level disciplines according to the type, such as concept, law, principle, fact, specification and so on. Course knowledge can belong to a certain subject area or cover many subject areas. In the course design of different types of knowledge, it is usually necessary to select materials and presentation methods suitable for this type of knowledge. Learning experience is different from subject knowledge. It is a process in which learners interact with the external environment and learn new knowledge, master new methods and form new ideas. For learning experience, course design should analyse learners' characteristics and arrange corresponding learning scenarios, so as to stimulate and guide learners to participate in learning activities vigorously. In designing the course content, we should not only determine the subject knowledge and provide appropriate learning materials, but also choose learning experience and provide appropriate learning situated activities.

2.2. Objective-oriented MOOC Course Design Framework Model
The Objective-oriented MOOC course design is to select and organize the course content according to the course objectives, and then carry out corresponding evaluation. The Objective-oriented MOOC course design framework model is shown in Figure 1.

![Figure 1. Objective-oriented MOOC course design framework model](image)

3. Principles of Objective-oriented MOOC Course Design
As MOOC is faced many user groups, MOOC course design should follow the following principles.
3.1. Define Course Objectives and Time Requirements
Describing course objectives clearly is the first step in course design, as is the case with MOOC, which is helpful for users to decide how to use the course, whether to study the whole course or to choose part of the course content. In addition, it is very important for learners who want to complete the course to make clear the time requirements, which is useful for learners to arrange their own time reasonably, complete various learning tasks in time and ensure learning progress.

3.2. Clear and Complete Course Structure and Learning Paths
One of the shortcomings of the previous online courses is that they lack clear learning paths while providing massive information and complex hyperlinks, which often causes learners to be submerged in various learning resources and the network formed by them, thus resulting in information overload to lead to low completion rate [2]. Therefore, in MOOC course design, it needs to avoid this problem, through providing a clear and complete course structure. It should be flexible and concise in the selection and organization of course content, so as to facilitate users to find the required knowledge or activities they want to participate in, and provide concise and clear advanced learning paths, so that learners can easily and clearly grasp the learning process.

3.3. High-quality Learning Media Resources
One of the reasons why MOOC is popular all over the world is that it provides high-quality learning media resources. High quality is not only reflected in the excellent production of learning videos, the use of high-definition video format, so that learners have a visual enjoyment; but also, more importantly, these resources are carefully designed, taught by high-level teachers, so that learners can enjoy the style of well-known teachers of famous universities. Therefore, MOOC course design should continue to maintain high standards of media resources design and production requirements, to attract the majority of users.

3.4. Humanized Collaborative Communication and Learning Situated Activities
Online learners with the help of the network are strange to each other, and the communication between learners is often spontaneous and depends on learners’ active participation, which lacks certainty and stability. The effective use of MOOC needs to overcome this shortcoming, and it is an effective way to establish a cooperative communication mode similar to traditional class. In MOOC course design, it can be stipulated in accordance with a certain number of student-teacher ratio (such as 50:1), to organize online classes equipped with course tutors, so as to establish a clear online class correspondence between teachers and students. In this way, learners can find a fixed teacher to counsel or some learning partners to communicate when they have doubts, which can enhance the human feelings and sense of belonging of online collaborative communication. In addition, MOOC can also use a variety of social media, such as blog, micro-blog, Wechat and so on, to design a variety of learning situated activities, in which learners can participate and display themselves, exchange and share learning results, encourage each other, and make progress together.

3.5. Timely Learning Evaluation and Feedback
No matter what kind of learning activity, learners need to invest their energy. Timely evaluation helps to bring learners a sense of achievement and make them maintain a strong interest in learning. MOOC is different from the previous Open Courseware (OCW), Open Video Course and Online Course, which provides an interactive micro-video that is in accordance with learners’ cognitive psychology and benefit to learners’ attention. This kind of embedded test, together with regular homework, innovative student mutual evaluation, course examination, Certificate Award and so on, constitute a comprehensive and timely learning evaluation and feedback mechanism, which is the necessary condition for the effective use of MOOC [3].

4. Selection and Organization of MOOC Course Content
The main task of MOOC course design is the selection and organization of course content. Course designer should differentiate cognitive objectives and expressive ones in view of learners and the
orientation of courses, and then choose and organize the corresponding presentation forms of subject knowledge and media resources, or learning experience and situated activities based on different course objectives. A typical selection and organization model of MOOC course content is shown in Figure 2. It is a progressive organization with a certain order, similar to the syllabus in traditional education.

![MOOC Course Content Organization](image)

Figure 2. Selection and organization model of MOOC course content

As shown in Figure 2, MOOC course content includes not only subject knowledge that is subdivided by knowledge units and then knowledge points, but also learning experience that is a situated activity design based on certain learning. This kind of organization is a logical arrangement which combines vertically and horizontally. From vertical dimension, it is arranged logically according to the sequence of subject knowledge units, and from horizontal dimension, it is embodied in the sequence of knowledge points in a knowledge unit. Situated activity unit is inserted in the learning process of knowledge units vertically or horizontally, which reflects that it needs learners to comprehensively use previous knowledge and experience so as to complete learning tasks.

4.1. Design and Organization of Knowledge-Media Resources

Knowledge content analysis is the premise of teaching media selection. Knowledge content oriented by cognitive objective is generally a well-structured knowledge system, and hierarchical analysis can be used. Hierarchical analysis is a reverse analysis process, which starts from a certain course objective, then analyses the knowledge that learners need to learn first until the initial knowledge of the assumed learner. Using the method of hierarchical analysis, the starting point, sequence and capacity of knowledge content can be determined step by step, so that the serialization of knowledge content is realized. After decomposition of knowledge content, the next step is to select the appropriate media representation of each knowledge point. In MOOC, micro-video is the most important form of media. A micro-video usually lasts for 8-10 minutes, not more than 14 minutes, focusing on a knowledge point.

The key to the design of knowledge-media resources is the segmentation of knowledge point. Reasonable segmentation of knowledge point not only helps to distribute the course information load equally, but also benefits to maintain learners’ interest in learning. It also contributes to improve the reusability of course resources, thus to expand the audience and decrease the cost of producing media resources.
4.2. Design and Organization of Experience-Situated Activities

Situated Cognition Theory believes that learning takes place in a certain situation, and that learning should be carried out in situations similar to the real world, aiming at solving the actual problems in real life. The authenticity of the problem is conducive to arousing learners’ interest in learning, while the situationalization of the problem is conducive to the transfer and maintenance of knowledge and skills. The design mode of situated activities mainly includes problem solving mode and project design one. Problem solving model implies the problem in the situation, in which learners use the clues and learning tools to model and solve the problem. Project design mode is to design the schemes around the scheduled research projects, so that the learners can master the process and methods of the research in the design process.

Scenario creation is presented by means of multimedia network technology, which can be a simple problem or project background description, or a complex virtual experiment environment. In the created scenarios, learners need to complete certain tasks or operations, such as completing a research report, a project design or a set of experimental operations. In these tasks or operations, learners get construction of knowledge, mastery of skills and improvement of ability. As above, in creating scenarios, learners can promote collaborative communication activities through the establishment of online classes. However, in the mixed teaching mode, face-to-face teaching in classroom can be used as a scenario for full and all-round information exchange to achieve high-quality learning in the form of students’ speech, role-playing and work exhibition.

5. Design of MOOC Learning Evaluation

A good course design should be integrate, that is, considering the relevance of course objectives, course content and learning evaluation. After determining course objectives, we should adopt the principle of "reverse design", which doesn’t consider course content temporarily, but think about learning evaluation first. This method of "reverse design" gives priority to learning evaluation, so that when we choose and organize the course content, our work will become easier and more effective [4]. In the course design of MOOC, we should use the idea of integrated course design, and fully consider the problem of learning evaluation from the beginning.

Design of MOOC learning evaluation should be a comprehensive and timely evaluation and feedback system. In the process of MOOC learning, we should give students timely feedback as far as possible to improve the lonely learning experience in the online environment through frequent feedback, and strengthen the learning effect. For example, timely evaluation and feedback are embedded in micro-videos to promote students' active thinking and meaningful learning. Learning evaluation should be based on the needs of course objectives.

For the cognitive objective-oriented course content, we can take the way of knowledge testing in the learning process or examination after course. For the expressive objective-oriented course content, we should adopt self-evaluation, learner-to-learner evaluation, teacher evaluation or face-to-face classroom evaluation, in the form of special report, role-playing, project design, exhibition of work, keynote speech, e-portfolio, etc. Expressive evaluation is accomplished in the actual learning situated activities. Unlike knowledge testing, expressive evaluation is not definite, which is more about grading students' attitudes and abilities in the process of situated activities. In the implementation of evaluation, we can adopt the method of combining self-evaluation, learner-to-learner evaluation and teacher evaluation. The results of evaluation are mainly based on the statistics of the total scores with certain weights for learners, and also include learners' self-evaluation, mutual evaluation and teacher evaluation in the process of situated activities.

6. References

[1] Wang Wenli. The Development of MOOC and Its Impact on Higher Education[J], Journal of Jiangsu Higher Education, 2013(2):53-57.

[2] Fan Wenqiang, Connectionism-based MOOC and Its Learning Support[J], Journal of Distance Education, 2012(3):31-36.
[3] Zhang Zhenhong, Liu Wen, Han Zhi. From OCW Classroom to MOOC School: The Return to the Origin of Learning [J], Journal of Modern Distance Education Research, 2013(3):20-27.

[4] L. Dee Fink, LI Kang. A Self-Directed Guide to Designing College Courses: Designing Courses That Promote Significant Learning (continue) [J], Journal of Fudan Education Forum, 2008,6(2):85-88.