“MOOCs” Platform-based Design Patterns and Thoughts in Microlecture of Zoonomy—Taking an Example of “Action Potential of Ventricular Muscle Cells”

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Abstract. MOOCs is a kind of new educational and studying mode emerged in recent years. MOOCs construction needs many links as well as needs to figure out many questions. Among those, the production quality of video class is a key issue of MOOCs construction. Taking “The Most Dedicated Worker-Action Potential of Ventricular Muscle Cells” as an example in the microlecture, this paper has summarized and thought deeply in design mode of microlecture from 6 aspects. In conclusion, an excellent microlecture is not only telling stories but also requiring it to be rich in contents. Meanwhile creative teaching design is the soul of microlecture.

Introduction

MOOCs (Massive Open Online Course) was first proposed by Canadian scholars Dave Cormier and Bryan Alexander in 2008. There were only 2300 registered users at the first class of MOOCs at that year. But there are millions of users registered in top three big MOOCs at present [1]. “China Mid-and-long term Educational Reform and Development Program Planning (2010-2020) ”has clearly pointed out, “information technology has revolutionary impacts on educational development, we must attach great importance to it” [2]. In 2013, over ten first-class colleges and universities including Peking University, Tsinghua University and Fudan University have set up the MOOCs platform. On March 29, 2014, the first world medical MOOCs education alliance-China Medical Education MOOCs Alliance was founded in Beijing. An increasing number of colleges & universities, educational institutions and network technology companies are actively engaged in constructions of MOOCs[3]. In construction of MOOCs, the production quality of microlecture plays an important role while the teaching design of microlecture is a priority among priorities of quality. Taking Taking the Most Dedicated Worker-Action Potential of Ventricular muscle Cells as an example of the microlecture, the writer has summarized and thought deeply in design mode of microlecture.

Concept of Microlecture.

The full name of microlecture is the micro video lesson, based on teaching videos as a major form, organically combined the teaching procedures with related teaching resources around key course points and difficulties [4]. Its core is micro videos, as well as containing teaching video content-related teaching plans, courseware and exercises, etc. The time of microlecture is short and the teaching contents are simple with outstanding theme, interest creations and various communications. Therefore, microlecture is a new teaching method developed on the basis of traditional teaching.
Characteristics of Microlecture

Outstanding Theme and Targeted Teaching
Microlecture carries out teaching mainly embraced with a certain knowledge point (especially important and difficult points) at classroom teaching. The teaching aims of microlecture are relatively simple, so teaching contents are more simplified and condensed. The teaching theme is more extruded and the teaching objective is more clearly. For example, in microlecture of “Action Potential of Ventricular muscle Cells”, the starting points are beginning with students’ questions, on the basis of pictorial multimedia courseware and changing abstraction into specifics in order to help students accurately understand and grasp the knowledge points.

Resource Diversity
Microlecture has built up a closely connected and real scenario-based micro teaching resource environment with the entire teaching activities based on micro-video as a core link and integrated with micro courseware, micro-teaching design, micro-exercises and micro reflection. Resource diversity has come up with higher requirements to teachers’ professional literacy on the one hand, even more concerns students’ personalized learning than traditional teaching on the other hand.

Short, Refine and Convenient to study
The video time of microlecture usually lasts for 6-10 minutes, with the longest less than 15 minutes. It furthermore meets the cognitive characteristics of modern students and the law of visual remaining. The size of microlecture is usually not exceeding 20Mb. Formats generally belong to online playing formats (such as Flv). Teachers and students can be smoothly online watching or downloading and saving in various mobile terminals, such as laptops, cellphones and Pads so as to achieve mobile and individualized studying. Hence, it is a very convenient and extremely fit for efficient living and studying models in the modern society. If microlecture is made having teaching, interesting and practical effects within short time, then the design of microlecture is a soul of the whole microlecture and MOOCs.

Design Patterns of Microlecture
Design patterns of microlecture mainly consist of 6 aspects: selecting theme; clearing teaching objectives; analyzing teaching contents and setting out teaching strategies; designing and writing teaching plans, producing microlecture; microlecture uploading and establishing appraisal system (Fig. 1).

![Figure 1. Design Pattern of Microlecture.](Figure 1. Design Pattern of Microlecture.)
Selecting Theme

What can we do within ten minutes? It could be a knowledge point, a process, a case or an experimental technique. The first step of a good microlecture design is to split the knowledge points and establish the relatively independent knowledge points that can be explained, such as application of glucocorticoid, microorganism digestion of ruminants, regulation of respiratory movements, animal anesthesia technique, etc. This form is more suitable to features of fragmented studies in the digital age and lives up to study habits of modern university students. Therefore, 40 minutes of classroom teaching contents in the past can be divided into several segments of microlecture with 10 minutes when doing teaching design. Each segment of microlecture is centered based on a question. This may require teachers to analyze and organize the teaching materials in the first place and then break up into several parts according to the internal logic and connections of teaching contents. Each part explains one question and every question is a length of micro course. In this way, a question-oriented hook-ups microlecture unit chain is formed then. It shall pay attention to training student’s consciousness of problems during teaching, constantly gather student’s questions and give answers, guide students to treat the learning process as a way of finding problems, analyzing problems and solving problems, thereby motivating student’s learning initiative and motivation.

Clear Teaching Aims

Analyze the job nature of students. Teaching contents shall be confirmed according to job nature. Students with different sexes will be varying in skills of knowledge levels, as well as receptible scopes. Required skills are also different according to different workplaces, so the training contents picked up may be varying to some extent. Students within different age groups will grasp different knowledge and skills, as well as leaning purposes. Definite teaching goals may concern individual differences and meet the personal demands of different learners.

Analyzing Teaching Contents and Setting out Teaching Strategies

The contents of microlecture shall be refining, compacting, logic and clear and should avoid irrelevant contents and able to catch the learner’s attention. The contents of microlecture can be connected with living examples of daily life and production practice. This will be better to promote achieving teaching objectives. The bioelectricity of cardiomyocytes is one of important and difficult points. It is a primary target for how to lecture it in a simple and easy way. Microlecture takes a management system of football team that people are familiar with as an example to analyze the connections in action potential conduction among sinoatrial node, atrioventricular node and ventricular muscle cells. Those ventricular muscle cells are described by the most dedicated workers, which will make students more easily understand the importance of ventricular muscle cells in cardiac muscle stimulation. The scenario-based teaching strategies, namely explanation of knowledge points running through in scene will promote the attraction of courseware and make the microlecture not only easily learned but also nice looking.

Designing and Writing Teaching Plans

The microlecture has the relatively short teaching time, simple contents and centralized explaining a question, so it puts forward a higher requirement to quality of teachers. On the one hand, teachers shall spend more time and energy producing videos of microlecture and make the curriculum, linguistic expression, board writing and courseware production better than common lessons; on the other hand, under the circumstances of studied related knowledge and looked up relevant articles, students may propose more profound and extent questions. Those are challenges to teachers’ professionalism and strain capacity. To sum up, the writer believes that we should use the excellent teaching ideas and methods of MOOCs for references under its background and take full advantage of its platform and resource. Meanwhile, according to characteristics of zoonomy, we shall constantly seek out student-centered teaching plans that can practically enhance students’ ability of thinking, practical levels and learning effects. Moreover, these designed teaching plans may allow courses with
problematization, real-situation cases, diversity and simplicity. The problematization is to produce motivation and desire to learn in the process of raising questions and releasing questions thereby constantly bringing in questions from practical problems that students are interested in, going forward one by one. This will make the theoretical studying no longer bald and motivate the initiative and enthusiasm of students’ autonomous learning. The real-situation cases are running the knowledge points through the case stories according to real cases. This will make the curriculum lecturing more visualized. The diversity is to organically mix the animation and videos and so on multimedia materials. This will make the lecturing be full of variety; the boring learning contents move; and more easily catch learners’ “attention”. The simplicity is to present the complicated theoretic procedure by simple stories, which will make the contents systematize and be good for memory and understanding.

**Producing Microlecture**

After analyzing teaching contents and writing teaching plans, knowledge framework needs to be connected by various kinds of processing software, mainly including collection and organization of materials, courseware production, video recording and post-processing, etc. This will require teachers understanding applications of various kinds of software, such as video production software, voice generative software, capture software and virtual studio, etc. It will strive for improvement of production quality of microlecture in the visual effects in order to achieve online teaching effects.

**Microlecture Uploading and Appraisal System**

Microlecture has a full set of teaching models and curriculum standards (including teaching, participation, discussion, homework, feedback, appraisal, assessment and certificate granting), with great scale, high degree of opening, transparency, easily acquired and repeatable characters, stressing on learning experience and interactive features, thereby achieving resource sharing; making the public obtain higher educational resources free of charge; and promoting the higher education in massification and popularization. Besides, it can be used as teaching resources. For example, teachers can release microlecture videos before and after class in order to supply students studying in advance and review after class. Teachers will remind the key points and difficult points therein as well as arrange questions and reference materials to guide students to deeply understand the course contents. In this way, students will “attend a lecture” ahead of class time and find questions during studying; put particular emphasis on in-depth exploration and problem solving in the classroom; thereby realizing a “flipped class”; allowing teachers becoming a motivator and inspirator from a lecturer or an explainer; making students become a real studying subject indeed.

**Prospection and Outlook**

Construction of MOOCs is a development trend of modern higher education. Guarantee of microlecture quality is an important link in the process of construction [6]. Writer believes that a good microlecture must have good teaching design. This is soul of microlecture, plus elaborate video producing effects in the late stage, all of which may need teachers to have a higher professionalism and teaching experience, as well as be familiar with software of courseware and video processing with an opening mind. An excellent microlecture is not only telling stories but also requiring be rich in contents, proper presentation, simple and easy, attracting students, meeting needs of personalized learning, and lifting up learning efficiency of students. A mixed flipped class can be carried out on the basis of micro-video. This will give full play to unique advantages of modern information technology. Therefore, students independent study ability will be significantly improved under an informational environment and the scope of their knowledge popularization will increased.

In the meantime of seeing those advantages, without doubt we shall realize that students will fully feel the campus life, campus culture and teacher-student relationships in traditional education. This kind of immersive experience and unconsciously impacts are essential in student learning knowledge, forming a right value and shaping perfect personality. Via teacher’s face to face lecturing and
communication may find out problems in time. This is difficult to realized by human-computer interaction. Secondly, fragmented and non-systematic microlecture may go against students to form systematic logical framework and influence the development of their cognitive structure. Thirdly, zoonomy is an experimental subject that involves in practice teaching. Students site view and hand-on experience have a world of difference to watch videos by sitting in front of computer. Therefore, MOOCs can be existed in teaching resources. It is a supplement of traditional teaching rather than a substitute. Its profound significance is the impacts of teaching reform directions and challenges to teacher’s ability.

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Reference


