Teaching Design Factors for Micro-Courses of Specialized Courses in University

Hong-yan SHEN

School of Environmental Science and Engineering, Hebei University of Science and Technology, Shijiazhuang, Hebei Province, Shijiazhuang City, China

*Corresponding author

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Abstract. With the development of information technology, the micro-course around a certain knowledge point or teaching link comes into being, and develops very quickly in China in recent years. It is received high focus and attention from the education department in China. This paper offers the concept of micro-course raised by the Ministry of Education's National College Teacher Network Training Center in November 2012. Then, micro-course and traditional teaching method were compared in this paper, the advantages and disadvantages of micro-course, the relationship between micro-course and traditional teaching method were obtained. Teaching design factor for micro-course were clearly put forward, in this part six aspects consist of design elements for micro-course, such as teaching time, teaching objective, teaching content, teaching method and micro-course technology. As a new educational idea and educational resource, the colorful micro-course not only provides an opportunity for the traditional teaching model to carrying on structural reform, but also injects vitality for the traditional teaching. The teachers in colleges and universities should develop micro-course actively, and effectively combine micro-course with traditional teaching, improve the teaching effect and level.

Introduction

The traditional teaching method used by most of the teachers is classroom teaching and students learning way is to listen in the classroom and to accept passively. This ancient and traditional teaching way has continued from ancient times to now in China. The teaching mode adhering to "evangelism-teaching-unquestioning" has a history for thousands of years. With the development of information technology in recent years, the micro-course around a certain knowledge point or teaching link comes into being with video as the carrier. Owing to the micro-course having the advantages of short time, fine content, vivid and adaptive to time fragmentation of modern people, which just make up for the insufficient of traditional teaching simple oral transmission, the student passively acceptance, so the micro-course develops very quickly. According to the survey, 54% of micro-classes have been applied to higher education. At the same time, the micro-course also makes the teaching organization structure and learning style of specialized courses in higher education change [1].

The concept of micro-course was first proposed by David Penrose in 2008 who is a senior teaching designer and an online service manager at college of the San Juan in New Mexico. The micro-course includes course content or online short video, as well as tasks and teaching activities (such as assignments and topic discussions). The micro-course is widely used for independent learning, online teaching, mixed teaching, distance learning in foreign countries, and has got some achievements, since David Penrose introduced the concept of micro-class and applied it to online courses. There are more and more articles and practices on the construction and evaluation of micro-course from 2011 to now in China. There are 3114 articles related to micro-course in CNKI in 2016 in China, and there are 1087 articles in the first half of 2017. Although the micro-course appears late in China, within a few
years, it has been a huge influence in China [2], so it has a great impact on the traditional teaching method in higher education.

Just as pointing out in the report of micro-course in university in China, the micro-course may be another card and even to win better students and social evaluations for university in the future, and the micro-courses had great influence on more extensive and profound communication and influence. In 2012, the Ministry of Education formulated the plan for the development of education information technology (2011-2020) and clearly states, "strengthening the training of education informationization level of teachers in colleges and universities, promoting the improvement of teachers' education information skills, and improving the teaching quality of education". Thus, the emergence of micro-course is a new form of education in the era of high informatization, therefore, it is received high focus and attention from the education department in China.

In this paper, based on the undergraduate teaching needs of education, micro-course is introduced into professional courses, taking into account the content and method of micro-course for environmental specialty courses, combining micro-course with traditional teaching mode, and serviced for environmental specialty teaching.

Concept of Micro-course

Micro-course is also called micro-lecture. Many experts in academia give different definitions about micro-courses. In November 2012, the Ministry of Education's National College Teacher Network Training Center offered a micro-course definition that micro-course refers to taking videos as the main carrier, records the teacher's complete teaching activities around a knowledge point or teaching links [3]. At present, this definition has been widely accepted and recognized by domestic scholars.

Comparison between Micro-course and Traditional Teaching Method

Micro-course is a deep fusion of classroom teaching and "Internet plus". Micro-course can be downloaded from computers, mobile phones and other terminals. Learners can independently control and adjust the learning environment, make the learning process relatively easy. The traditional teaching is that the learner must go to the specified location to study the specified content at the prescribed time, and in class, students may lose key points of knowledge if they are distracted. The micro-course usually takes 10-15 minutes. This is consistent with cognitive theory which suggests people can only focus on the energy for 10 minutes. And the micro-course mostly focuses on the teaching difficulties and key points, it is the concentrated essence of traditional teaching time and content [4]. So micro-course enriches the connotation of the traditional teaching method. However, as a kind of preset solid learning resources, lack of interaction is its biggest drawback. Therefore, micro-course cannot replace classroom teaching, it can only serve as a good complement to traditional classroom teaching.

Teaching Design for Micro-course

Present Status of Micro-course Design

The results from the online questionnaire survey of the first university micro-course teaching contest in 2014 show that 84.6% of teachers consider that the teaching design is the most important part of micro-course making process, while 28.3% of teachers think that the current micro-class teaching design creativity is not enough [1]. Thus it can be seen that the teaching design of micro-course is an important and difficult task. The traditional teaching method based on teaching unit or class is not suitable for micro-class.
Design Elements for Micro-course

Under the guidance of teaching theory, based on the characteristics of teaching objects, teaching design means system activity that teachers organize teaching contents and resources, design teaching activities and learning environment, and finally support the learners to effectively achieve the learning goals [5]. Teachers should consider the following five aspects in the design of micro-course.

The first element is the teaching time. The research of brain science has proven that human only can maintain a very dedicated mental state for 10 minutes, that is to say, the 10-minute rule of attention, therefore, the teaching time of micro-course should follow the 10-minute rule.

The second element is the teaching objective. At first teaching objective should be set according to the syllabus; secondly, the teaching goal of micro-course should consider the teaching time of micro-course, that's the 10 minute rule. However, the performance of micro-class teaching objectives can be varied, for example, you may use the screen tell learners learning objectives directly, you can also tell learners learning objectives in oral language.

The third element is the teaching content. The basic principle for selection of teaching content of micro-course is not only determined according to the characteristics of the course, class assignments, teaching emphasis and teaching difficulty, but also consistent with the teaching objectives and teaching time. Firstly, the design of the teaching content of micro-course should focus on the breadth, depth and presentation of teaching content; secondly, the content of micro-course should be concise, compact and logical; thirdly, the content of micro-course should connect theory with practice, fully embody the teaching objective. Based on the above consideration of micro-course teaching content, the logic of micro-course can be clear and easy to understand.

The fourth element is the teaching method. There is no requirement and a fixed pattern for the presentation of micro-course. "Traditional teaching method + Video" is the main form of micro-course. Good video effects coupling with an incisive interpretation can show the advantage of micro-course, which is vivid, interesting, intuitive, just make up for the lack of traditional teaching. Owing to the lack of communication, the interactive of micro-course is poor. In order to make up for this shortcoming of micro-course, micro-course teaching method should increase the interactive links to attract learners enough attention and ensure the learning effects.

The fifth element is micro-course technology. Most form of micro-course is video, but video capture, editing, production, upload and so on require the micro-course producers understand the relevant technology [6]. The results of the questionnaire survey from the first national college micro-course participating teachers show that 52.2% of the teachers consider that the post-editing and processing technology of the micro-course video are very difficult, and 48.8% of the teacher believe that micro-course video shooting is very difficult [1]. Thus it can be seen although the micro-course is a new form of deeply integration of information technology and traditional teaching, micro-course production technology is the guarantee of successful implementation of micro-course teaching.

Conclusions

As a new educational idea and educational resource, micro-course not only conforms to the trend of social informatization, but also conforms to the trend of reform and development of education and teaching in colleges and universities. The colorful micro-course not only provides an opportunity for the traditional teaching model to carrying on structural reform, but also injects vitality for the traditional teaching. The education workers in colleges and universities should use the micro-course as the base unit, use the internet system as the platform, actively try to develop micro-course, and combine the micro-course with the traditional teaching mode, improve the teaching effect and level.

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