ABSTRACT

In this article, the authors provide a new approach to massive open online course: project based case learning. Although there are many online teaching websites, such as Coursera and Edx, most of the courses are video based. That is, students learn knowledge through watching lecture videos. This method may apply to theoretical subjects, but for engineering courses—since they have strong practical background—watching videos is not an effective way for these courses. In order to solve this problem, the authors offer this new approach: that is, students learn knowledge by playing as different roles and doing and concluding different tasks themselves. And all tasks form a whole project. This project based case learning method uses “learning-by-doing” as a central theme and E-learning as a carrier. Compared with video based learning, this new method is a combination of theory and practical operation that enable the students to master the knowledge in engineering subjects more thoroughly and profoundly.

Keywords: E-Learning, Learning-By-doing, Project Based Case Study, XML

1. INTRODUCTION

Massive open online courses (MOOCs) are a recent development in online education aimed at unlimited participation and open access via the Web. They are a potentially disruptive technology, changing how education is delivered and funded around the world (Dasarathy et al., 2014). Since 2012, a growing number of universities have offered MOOCs worldwide and the public and academic discourse around MOOCs has intensified. MOOCs have been endorsed as a major advancement of higher education. For example ‘Quality Matters’, a US quality bench-marking and certification programme, argue MOOCs offer quality because they are designed for the ‘typical student’ and integrate with established higher education programmes (Margaryan et al., 2015). With the rapid development of MOOCs, the use of video for learning has become widely employed for the past decades (Giannakos, 2013). Most

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MOOCs only offer several lecture videos and review questions for students to study. And there are several instructional design models and theories applied in video based learning (Disck and Carey, 1990; Kemp et al., 1994; Passerini and Granger, 200). This method is straightforward and easy, but for engineering courses which have strong practical background, such as software engineering, this method may not work well because through watching lecture videos, students learn knowledge passively instead of positively, they rarely conclude and apply knowledge themselves. So the video based learning is not suitable for engineering courses. In order to solve this problem and improve students’ practical ability, inspired by learning-by-doing (Schank, 2001; 2007), we begin to think of a new teaching method: Project based case learning, that is, students learn knowledge by playing as different roles and doing and concluding different tasks themselves, teachers only play as instructors that give students suggestions when students get stuck. And all tasks form a whole project, this project itself is a studying case. Also we mainly applied this method to MOOCs so that students can finish the tasks on the Internet. It is a kind of E-learning. In short, this method uses “learning-by-doing” as the main idea and E-learning as a carrier and it is designed for engineering courses. The learning process is as follows: the instructors first design some studying cases, and these cases need different students to complete different tasks, students first need to play as different roles and complete different tasks in a project, and when a task is finished, the instructors can view it and give suggestions or feedbacks. Through this process, students not only need to think positively and thoroughly, but also need to find most materials themselves. So it is a good chance for students to master valuable practical skills.

However, there are some key difficulties when applying this method: first, since the engineering cases are various, how to conclude a generic structure of a studying case is the main problem, without the generic structure, it is hard for us to integrate it into the MOOCs. Second, how to describe these studying cases is also a good question, the method should be easy and straightforward. Finally, what is the workflow of integrating the studying case into the online learning website’s database, the last question is vital because we need the elements in the studying cases to define different tasks for students to study.

In this paper, we will address these questions one by one. In section 2, we mainly talk about the characteristics and advantages of the project based case learning. In section 3, we discuss how to conclude a generic structure of engineering cases and offer an easy and simple method to represent the studying cases. Also, we give the workflow of how to integrate the studying case into database. In section 4, we give an application of this method.

2. CHARACTERISTICS AND ADVANTAGES OF PROJECT BASED CASE LEARNING

Based on the discussion above, it is obvious that project based case learning is designed for the practical courses such as software engineering. Its main characters lie in the following points:

First, it is a student-centered learning method. Second, the learning case uses the form of project and it contains all the elements of a project, such as time, resources and expenditure. It also contains all the stages of a project: start, planning and execution. Besides, students work on the project in teams and undertake different roles, such as developer and tester. Finally, when one project is finished, instructors can evaluate students’ reports can give feedbacks. As for the advantages, compared with traditional method, it definitely has many advantages that we will explain in the next three paragraphs.

The first character is the adoption of the idea “learning-by-doing”. Learning-by-doing was offered by Roger Schank et al (1999). This learning method requires students to do it themselves from the very beginning; they learn from acquiring, concluding and applying knowledge themselves (Schank et al., 1999).
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