

Design of MOOC for In-service Teacher Professional Development: A Case of Teachers' Refresher Training Course in Hong Kong

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Abstract: This paper describes the design of a video-based massive open online course (MOOC) with a scalable activity structure for in-service teachers' continuing professional development (CPD). The course has been developed and delivered in the open learning platform. We design this MOOC to aid teachers to learn anytime and anywhere, and exploit teacher professional training with the infusion of collaborative learning and self-directed learning.

Keywords: Massive open online courses (MOOCs), in-service teacher professional development, self-directed learning, computer supported collaborative learning

1. Introduction

The Internet has influenced the way we learn, work, live and socialize. The widespread use of computers and the Internet have made distance learning easier and faster. Massive Open Online Courses (MOOCs) are a recent development in distance education which began to emerge in 2012 (Pappano, 2012; Lewin, 2013). It has been anticipated that MOOCs will gain wide spread as an educational form. The rapid growth of information and communication technologies (ICT) and rising computer knowledge of people make possible appearance of this new educational form. Wikipedia (2014a) noted that there are two key features to a MOOC that contrast it with established university course delivery: (1) Open access-anyone can participate in an online course for free; (2) Scalability-courses are designed to support an indefinite number of participants.

In recent years, in-service teachers' continuing professional development (CPD) in ICT is a major priority in K-12 education in Hong Kong. In-service teachers are demanded to learn continuously so as to enhance their professional capacity. Through engaging in continuing professional learning and reflection, teachers can acquire the professional knowledge and skills in ICT for assuming the role and responsibilities of a teacher (Advisory Committee on Teacher Education and Qualifications, 2009). Education Bureau, the Government of the Hong Kong SAR has organized a lot of refresher training courses (RTCs) in information technology in education professional development programmes for teachers.

However, we found that the attendance rates of these courses were unsatisfactory. RTCs generally must take place after school, in the weekends or in the summer holiday, thus imposing on teachers' personal time, which cuts into time needed for other tasks. At the same time, we found that professional development experienced by substantial proportions of teachers lacks key pedagogical qualities that make it effective, including time to think about, collaborative learning, follow-up activities, and sharing with teachers from other schools (Smylie et al., 2001). So the sources and means of which RTCs are delivered to teachers should be carefully assessed.

To improve teacher professional development and foster their collaborative learning and self-directed learning, we design a MOOC, which has been developed to aid primary and secondary school teachers to implement effective teacher professional development training.

In the paper, we elaborate the reasons, principles and framework of the design of the above mentioned MOOC and conduct effective teacher professional development training to facilitate teachers' self-directed learning and computer-support collaborative learning.

2. Background

2.1 Massive open online courses (MOOCs)

MOOCs are online courses aimed at unlimited participation and open access via web (Wikipedia, 2014a) and are receiving increasing attention and interest from several communities involved in online distance education. The first MOOC emerged from the open educational resources (OER) movement, named "Connectivism and Connective Knowledge (CCK08)", was a unique event in 2008, which was led by George Siemens of Athabasca University and Stephen Downes of the National Research Council. In 2012, starting with the widely-publicized online courses at Stanford University, several universities are engaged in offering online versions of regular courses, through companies such as Coursera, Udacity and edX. Most in-service teachers cannot afford time to participate in conventional face-to-face professional development training courses. Thus MOOC provides a promising solution to the problem.

2.2 In-service Teachers Continuing Professional Development (CPD) in Hong Kong

Advisory Committee on Teacher Education and Qualifications (ACTEQ) in Hong Kong released "CPD Document 2003" in November 2003 and proposed a teachers' CPD framework. A "soft" target of 150 CPD hours in a three-year cycle is set, within which teachers can deliberate on the direction and content. Teachers' CPD refers to all kinds of learning opportunities that help them strengthen their professional practices. Today, ICT can facilitate not only delivery of instruction, but also learning process itself (Jung, 2005). Thus the government wishes to provide a variety of refresher training courses (RTCs) to teachers in Hong Kong to improve teachers' ability to promote student learning and development and to update teachers' knowledge and skills in teaching and learning.

Generally, the course duration of each training event is 6 hours (in two 3-hour sessions on two different days to give ample time for participants to complete assignments between the two sessions). Event must take place in the evening of workdays, in the weekend or summer. The maximum number of participants for each event is 25.

2.3 WebQuest

A WebQuest is an inquiry-oriented format in which all the information that learners work with comes from the web (Dodge, 1995). It can foster collaborative learning through collaborative activities with a group-based project, encourage independent thinking and motivate students. The use of WebQuest can serve as a powerful and an efficient tool for teacher professional development (Johnson, 2004). It is also a learner-centric project-based learning approach for facilitating K-12 students to pursue collaborative inquiry learning on the Internet, and is becoming an integral part of education. For effective integration of WebQuest into school education, trainings should be provided to teachers to equip them with the pedagogical knowledge and skills required, which will facilitate teachers' self-directed learning and collaborative learning. So we choose WebQuest as a production case to design this MOOC.

3. Design

3.1 Principles of the MOOC design

3.1.1 Self-directed learning (SDL)

Self-directed learning (SDL) is learning in which the conceptualization, design, conduct and evaluation of a learning project are directed by the learner (Brookfield, 2009). In the context of a self-directed learning environment, all decisions about how and what to learn, and how or whether to consult external resources, are decided by the learners. Some educational institutions are finding ways to support self-directed study through open-learning programs, non-traditional course offerings and other innovative programs (Knowles, 1975). Rita Kop mentioned that SDL on open online networks is now a possibility as communication and resources can be combined to create learning environments. Downes proposed that teaching strategies in his MOOC, named *Connectivism & Connective Knowledge 08*, allowed the educator to have the role of facilitator. Nowadays most of scholars and educators believed that MOOCs can facilitate participants' self-directed learning.

In a traditional classroom of RTCs, knowledge transfer from educators to learners. However, in this study, teachers learn WebQuest through MOOC can manage their time, find resources and choose the subject they want to learn about or the activities they want to engage in.

3.1.2 Computer Supported Collaborative learning (CSCL)

Computer Supported Collaborative learning (CSCL) regards learning as a social process, where each individual participant, or learner, is responsible for creating his or her own knowledge through social interaction with other human beings by interacting with physical objects (Miyake, 2007). CSCL refers to an instruction method in which learners at various performance levels work together in small groups toward a common goal (Gokhale, 1995; Johnson & Johnson, 1986). The shared learning gives learners an opportunity to engage in discussion, take responsibility for their own learning, and thus become critical thinkers (Sills, 1991).

According to Vygotsky, knowledge is social in nature and is constructed through a process of collaboration, interaction and communication among learners in social settings. The collaborative learning through MOOC provides learners with opportunities to analyze, synthesize, and evaluate ideas cooperatively. Because in traditional classroom, teachers barely discuss and just listen what the educators taught. They barely have chance to share and receive constructive feedback. The massive open online platform can facilitate discussion and interaction among teachers.

In this MOOC, we set up a discussion forum for teachers to ask questions and discuss with peers. During the learning process, this WebQuest MOOC can facilitate teachers' collaborative learning and then they can use WebQuest to teach their students to improve students' high-level thinking and inquiry-based learning skills.

3.2 MOOC Design

3.2.1 Platform

Moodle is an open-source Course Management System (CMS) that universities, communities, colleges, K-12 schools, and even individual instructors use to add web technology to their courses (Cole & Foster, 2007). It presents one of the most widely used open-source e-learning platforms, enabling the creation of a course website and ensuring their access only to enrolled participants (Dougiamas & Taylor, 2003). Moodle allows the exchange of information among users geographically dispersed, through mechanisms of synchronous (chats) and asynchronous communication (discussion forums). It also has easily configurable features, allowing the creation of participants assessment processes (quizzes, online tests and surveys), as well as managing their tasks with their timetable (Mahmoud, 2008; Costa, 2012). According to the advantages of Moodle platform to enrich the process of teaching and learning, in this study we design and establish all the course materials using learning modules of Moodle platform. Figure 1 shows the modules of MOOC platform. Teachers who would like to participant in this course can login the platform anytime and anywhere. It solves the limitation of teachers' time and geographical locations to a great extent.

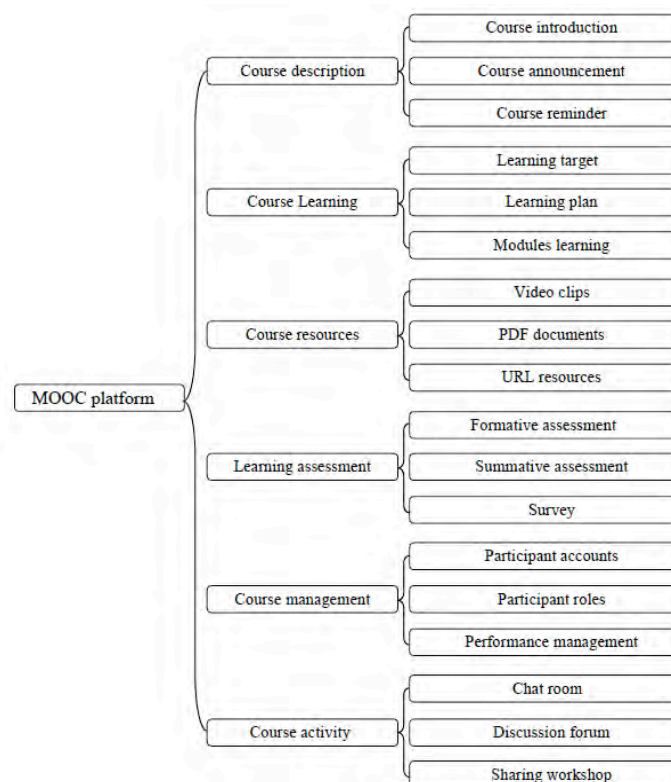


Figure 1. Modules of the MOOC platform

3.2.2 Basic requirements

This MOOC is mainly composed of 12 video-based lecture modules, formative assessment quizzes (each articulated to the end of a module), discussion forums for teacher community building (facilitated by an online tutor), and summative assessment tests. Teachers can select their own learning track by taking different lecture modules in accordance with their own grade of teaching (primary or secondary) and their own subject of teaching (four Key Learning Areas (KLAs): English Language, Chinese Language, Mathematics, and Humanities). After passing all formative assessment quizzes and completing all community-building and summative assessment tests, participants will be awarded an e-Certificate, and six hours of CPD by EDB.

3.2.3 Quality

The design and content of this course captures some trends that have emerged in recent years in the field of MOOCs learning. To ensure teaching and learning effectiveness, course designers, instructors and online tutors involved in this course have provided teacher coaching support or teacher professional development in designing and implementing WebQuest in schools over five years.

3.2.4 Module design

The delivery structure for MOOC is based around a self-enrollment, self-paced completion of the learning activities that are presented over 2 months. In the system, teachers from different disciplines will decide when they would like to login the system to learn, where they want to set as a connection to assess to the course. What's more, they could select their own learning track by taking different lecture modules in accordance with their own disciplines. The instructional content is delivered via a series of short video clips, which range from 10 to 20 minutes in length. Total duration of these video clips is 6 hours. The video clips were high-quality and developed with a professional television crew in a recording studio setting.

We design this MOOC with 12 modules. Each module contains a video clip. Except Module 4, to tailor-made the needs of teacher participants teaching in different KLAs in primary and secondary schools, we prepare 8 versions of video clips correspond to 8 types of KLAs. Figure 2 shows the modules design of this WebQuest MOOC.

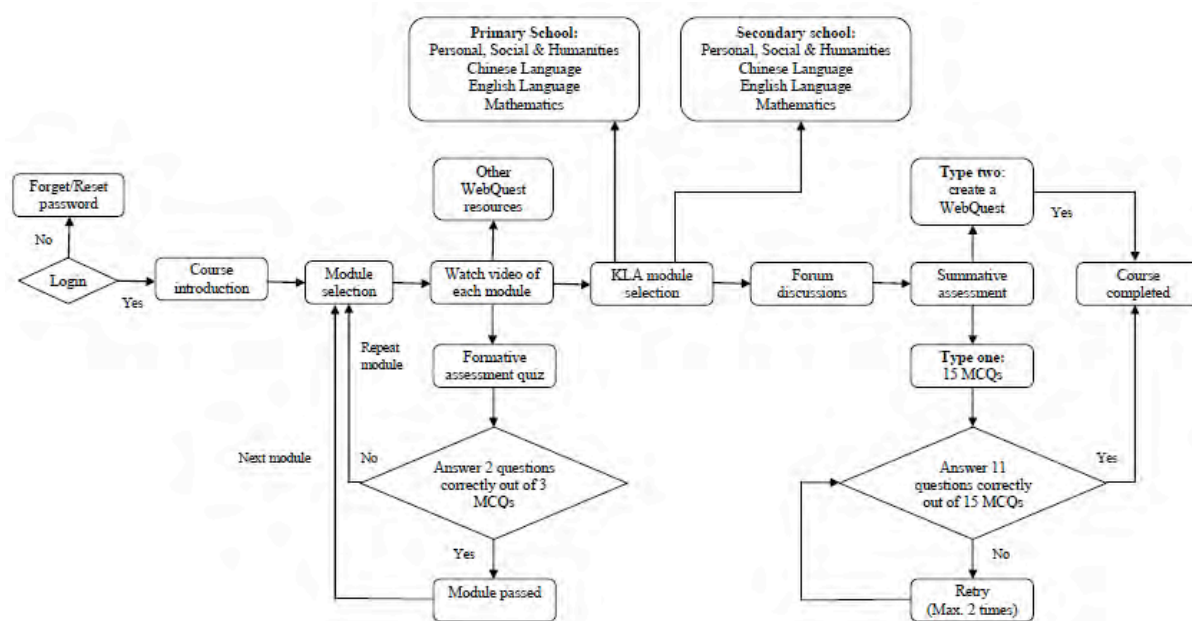


Figure 2. Modules design of this WebQuest MOOC

3.2.5 Assessment

Since teachers may take different modules in different time, to give them larger flexibility to join this course, we arranged formative assessment quizzes with 3 multiple-choice questions (MCQs) at the end of each module. The MCQs were presented to teachers with the goal of allowing teachers to gauge their understanding of the material presented in each video clips. Teachers have to get a pass with at least 2 correct answers in a quiz before proceeding to the next one. Participants can download the PowerPoint file of course material in each module as a reference when taking the quizzes. Any queries after joining the assessment, participants can raise questions in the online discussion forum. Online tutors will give teachers guidance to acquire the knowledge.

For the sake of modifying teachers' thinking or behavior to improve their learning, we design formative assessment quizzes at the end of each module. And the feedbacks should be supportive, timely, and specific. The feedbacks come in a variety of types, such as verification of response accuracy, explanation of the correct answer, hints, and worked examples. If teachers didn't pass the quiz, they can repeat watching the correspondent video and search for supporting resources from the web to improve their learning.

At the end of the course, we designed two types of summative assessment quizzes for teacher participants. Type one is to finish a quiz with 15 MCQs. Teacher must get a pass with at least 11 correct answers. Teachers will have 3 chances to attempt. The platform will give the prompt feedback to teachers. Type two is to create a WebQuest originally according to the specific KLA and level (primary and secondary) the teachers teach. Teachers who will choose this type of summative assessment are recommended to form a group to discuss how to create, evaluate, adopt and improve a WebQuest. This process achieves the CSCL that teacher will engage in the discussion to form their own construction of learning.

3.2.6 Activities

Instead of merely watching video clips online passively, this MOOC also want to facilitate teachers' SDL and CSCL and let their online learning actively. We established a wide variety of

learning activities, like hands-on practice and online discussion forum responding reflective and collaborative questions.

In addition, inter-school subject-specific teacher communities are built for users to share good teaching practices.

4. Conclusion

In this WebQuest MOOC, with computer and Internet, teachers have the opportunity to study anywhere regardless of their busy schedule. The principles and flows of design of this MOOC provide educational designers with insights on designing MOOCs for in-service teachers' professional development training course. Next step, we will evaluate the acceptance and learning experience of teachers who have completed this MOOC. And we will explore if our work can apply to other courses of teacher professional development.

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