

Chapter 32

Analyzing Critical Functions of Recording Tools for Synchronous Cyber Classroom Instruction

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ABSTRACT

Digital learning content is one of the crucial components for online courses. There are many ways for creating digital learning contents. Among them, recording of live instructional activities is becoming one of the most important methods to produce learning contents. However, the previous studies mainly focused on how to create digital learning content in offline mode, very few literatures addressed how to effectively record live instructional activities for digital learning content. This chapter focuses on how to effectively record live instructional activities conducted in synchronous cyber classrooms. The aims of this chapter are firstly to identify the recording scenarios for different modes of instructions in synchronous cyber classrooms, secondly to explore the functional requirements for different types of instruction modes, and finally to find out the best match between the instruction modes and the essential functions of recording tools.

INTRODUCTION

To meet the needs for flexible learning, e-learning has become an inevitable trend in educational sector (Yang & Liu, 2007). For online instruction, teachers have to prepare digital learning materials for students. The prepared digital learning materials are then published onto some sort of learning

management system which can support students to learn anytime and anywhere. Typical digital learning materials include Web pages, lecture notes, presentation slides, quizzes, and so on. We argue that to better utilize teacher's domain knowledge for facilitating students' learning, providing the recordings of various instructional activities as one type of digital learning materials is very

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important. As most teachers continue to conduct various instructional activities in traditional physical classrooms, many tools and solutions have been developed and deployed to record the whole process of instruction in physical classroom settings (Choi & Johnson, 2007). These digital recordings can be then published on the Web for sharing and reuse as a type of digital learning materials, for example, MIT Open Courseware (<http://ocw.mit.edu/>) and Yale University on iTunes U (<http://itunes.yale.edu/>).

A typical instruction process for a teacher offering a course for students includes four main steps:

1. Prepare lecture notes/slides
2. Conduct lecture based on the prepared slides
3. Demonstrate some examples or cases
4. Facilitate discussions, including questions and answers (Q&A).

These four steps are typically repeated on a weekly basis throughout the whole semester. In a traditional course, the teacher prepares lecture materials (the first step) before the class and carries the remaining three steps in the physical classroom. The main drawback of this approach is that once a classroom session is finished, all the activities that happened during the instruction are lost. It implies that students do not have a second chance to review any part of the lecture, the demonstration and the discussion after class because no recording is generally available to them of the instruction that took place in the class.

This chapter focuses on how to effectively produce recordings for better online learning in an online synchronous instructional setting. Here we only address the scenario of a teacher conducting live instructional activities in an online synchronous cyber classroom (Chen, Ko, Kinshuk, & Lin, 2005; Chen & Wang, 2008; Hastie, Chen, & Kuo, 2007; Wang & Chen, 2009). This implies that the teacher and the students are participating from different locations but at the same time for a

certain period of time in a weekly basis throughout the whole semester. Asynchronous learning activities like discussion forums and self-paced surfing of online materials are excluded in this chapter. In traditional classrooms, the teachers usually give lecture by using lecture notes, and this is also becoming a common practice for teachers to conduct online lectures. For example, a teacher would create a few PowerPoint slides to introduce the concept of TCP/IP routing algorithm in a class for “Computer Networks” and will deliver lecture using those slides. There have been attempts in the literature to record physical classroom lectures by using video recording devices, but with limited success. A major problem is the quality of the recording, which is generally not good enough for the contents of the slides to show up clearly in such video recordings.

Another problem relates to the focus on instructor versus focus on the slides. Unless the camera is far enough at the back of the classroom, instructor’s video and slides’ video do not normally appear at the same time. If camera indeed is placed far enough to capture both at the same time, the slides suffer from quality reduction. Not being able to see both instructor and slides at the same time contributes to the loss of non-verbal cues and/or loss of context due to the problems in the alignment of instructor’s explanations with the slides. When the recording is made as a single streaming video, it is also very difficult to locate/jump to certain explanations in the video without requiring significant efforts on the part of the instructor in creating an index of concepts within each video recording. Lack of such possibility, on the other hand, creates a great difficulty when students want to review a certain topic, since moving forward and backward just to search a certain topic is very time-consuming, inefficient, frustrating and demotivating. Another major problem is the need of additional human resources, such as camera operator, and resources, such as the camcorder device and related peripheral, required for each

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