Synchronous and Asynchronous Learning Environments

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INTRODUCTION

This paper discusses the organizational and pedagogical aspects, benefits, and disadvantages of synchronous and asynchronous technologies as platforms for creating distance learning environments. By comparing the advantages and challenges of the two learning environments, teachers will be able to match the appropriate learning environment and its teaching strategy to their learning goals.

These two learning environments involve distance learning. *Distance education* (or what is commonly termed "distance learning") is a method of education in which the learner is physically distanced from both the teacher and the institution providing the instruction. Learning may be undertaken either individually or in groups. According to USDLA (2006), distance learning is: "The acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance."

In its original form, teachers and students in distance education corresponded via regular mail, telephone, or fax machine. The students usually submitted their assignments by mail. Using various forms of electronic media, such as radio, television, and videoconference, and advanced communication technologies such as satellite, cables, e-mail and Internet technologies, increases time effectiveness, enables flexibility of location, and improves delivery of information (Mielke, 1999; Schlosser & Simonsen, 2002).

In distance learning, teachers and students may communicate asynchronously (at times of their own choosing) by exchanging printed or electronic media, or through technology that allows them to communicate in real time (synchronously). This chapter focuses on synchronous and asynchronous learning environments implemented by various technologies.

BACKGROUND

Definitions of Synchronous Distance Learning (SDL) and Asynchronous Distance Learning (ADL)

Distance Learning can be either synchronous or asynchronous. In both, the teacher and students are not physically in the same classroom. In SDL, class members can participate simultaneously, and there is no time lag between teacher and students in spite of the physical distance. In ADL, the teacher and students are separated by both time and space, and learning does not occur at the same time that the learning material is presented. Students learn on their own, individually, at their leisure.

According to Frank (2006), in synchronous communication, teaching and learning are conducted simultaneously and there is a physical separation between teacher and students. The teacher is in the broadcasting studio, which contains the technological means to transmit voice and data (data such as PowerPoint slides). Learning may be undertaken either individually or in groups. In the former form, students who are usually located at their individual homes use their personal computers to interact with the instructor via the Web. In the latter form, students are located in a distant learning center, which generally is technologically set up to allow communication between the teacher and students (a computer for each student or group of students, microphones, headphones or speakers, etc.). Students see the course content on their computer monitors or on a large central screen. Sometimes, the communication also includes two-way video—cameras in the broadcasting studio transmit pictures of the teacher to students and cameras in the learning center transmit pictures of the class to the teacher. Computerized synchronous communication courses are especially prominent in

situations where it is difficult for students to come to an educational facility everyday due to geographical or other obstacles.

Every synchronous distance learning course may have an asynchronous element that includes recording all lessons and some face-to-face meetings. Usually, the first meeting between the teacher and his or her students in synchronous distance learning is a face-to-face meeting. The students are invited to this type of meeting in order to become acquainted with each other and with the teacher. They should also be provided with some details and information about the program's technologies and procedures (Frank, 2006).

Some Benefits of Both Synchronous and Asynchronous Distance Learning

Much has been written about the disadvantages of traditional teaching, where students are passive. In contrast, both synchronous and asynchronous learning environments, despite their shortcomings which are presented next, do not appear to have this built-in passivity. Both learning environments easily allow teachers to reap pedagogical advantages—applying active and interactive learning principles, using multimedia, organizing the course and its lessons, and providing immediate feedback to students about their progress. Students must be both active and interactive; teachers must organize their courses and the material for the lessons in advance through "trees" that make orientation easy; it is possible to provide feedback and to use multimedia and multiple representation means.

In both approaches, a single, highly qualified teacher can instruct several remote sites so the course can be given to a relatively large number of students (an economic advantage). In addition, it is possible to use statistical data stored in the technological system for follow-up of students' progress.

Some Benefits of SDL over ADL

The literature indicates several advantages of SDL over ADL. For example, Davey (1999) emphasized that teachers can provide all students ongoing and immediate performance feedback. In a course described by Frank, Kurtz, and Levin (2002a), much use was made of a tool that also permitted immediate feedback for the teacher.

According to Carr-Chellman and Duchastel (2000), the advantages of SDL over ADL include a more direct sense of collegial instruction and immediate answers to the questions posed. Branon and Essex (2001) noted the advantage of simultaneous team decision-making and brainstorming. Power et al. (1999) indicated that synchronous instruction allows students to communicate in real time with each other and with their teacher.

Lister et al. (1999) found that the synchronous part of their course was of crucial importance. Learning outcomes and student retention rates in their purely asynchronous courses were often disappointing for all age groups. However, in the synchronous section of their distance course, they attempted to create a "social construct"—an interactive, face-to-face classroom. The teacher could thus begin each lesson by asking if there were any questions about homework, reading assignments, or group projects. To help answer students' questions, the teacher could then activate the system's whiteboard and shared stored graphics, or solve analytic problems interactively by writing texts and equations on the white board which then appeared on all the students' screens. He/she could also call up a "question and answer" tool that allowed for real-time interactive quizzing and polling. Following the set-up of a typical studio classroom, the teacher could then present a brief lecture on new material, sharing PowerPoint slides and multimedia material, or using synchronized Web-browsing, lead students to Web sites with course-related contents. Furthermore, the synchronous sessions helped keep students abreast of course deadlines and build teams and a sense of community, allowed them to receive immediate feedback and improved retention rates.

SDL: Challenges and Issues

Apart from the relatively complex logistics of organizing synchronous meetings, the necessity of attending classes (or being home) at specific times and a lack of face-to-face interaction with the teacher may have an adverse affect on some students. In other words, this method is not suitable for everyone.

Weak students, or those who are too shy to participate in an ordinary classroom session, are likely to be even more ill at ease when they realize that they can be heard in real time by many other students, most of whom they have never even met. "Because of the

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