Experiences in Collaborative Distributed Learning Across Geographies and Heterogeneous Student Populations in a Graduate Engineering Course

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ABSTRACT

This article discusses the use of distance learning technology to build an effective learning community across geographies and heterogeneous student populations. We contend that this is done most effectively by combining both synchronous and asynchronous methods. We describe our experience teaching a graduate course where we adopted an approach of strongly encouraging interaction during and after lecture and requiring students to collaborate in geographically dispersed groups, utilizing the appropriate technologies to enable this collaboration. The paper presents students’ reactions and lessons learned regarding the use of technology in course delivery and collaboration across geographies.

Keywords: distance education; asynchronous methods; distributed learning; graduate education

INTRODUCTION

It is well known that distance delivery of courses imposes additional logistics for distribution of assignments, grading, proctoring of exams, general communications, etc. (see, for instance, Crossman, 1997). Yet, overcoming these logistical issues is by itself insufficient to ensure the success of a course. The real challenge resides in building an effective learning community.

Flugrad et al. (2000) suggest some techniques for achieving this in a distributed learning environment.

This paper describes the author’s experience in teaching a graduate course to a heterogeneous student population combining synchronous and asynchronous methods. A number of questions arise in such a mixed environment, including:

- Does the availability of lectures for
streaming over the Web result in decreased attendance by traditional (on-campus) students to the live lectures?

- Do students who only have access to the asynchronous aspects of the course perform any differently from those who participate in synchronous activities?
- Are there ways to encourage both groups of students (traditional on-campus students and part-time off-campus students) to collaborate? Are there any benefits from doing so?

We address these questions through a case study. A geographically distributed mix of traditional full-time and part-time students, who typically held full-time jobs, taking a Computer Engineering course provided a unique opportunity. It has been observed (Prusak, 1999) that this type of population mix can enhance the overall learning experience, with each group contributing with its own strengths. Non-traditional students typically bring a higher level of maturity, work ethic, and in-depth knowledge of practical implications of the subject; full-time students tend to have fewer time constraints and therefore are better able to focus on the tasks at hand, and are generally more familiar with theoretical and analytical methods. The risk exists, however, that when both on-campus and remote students are present in the same course, one of the groups may feel disenfranchised and therefore have a much less positive view of the overall course than the other group, as reported by Lewis (1997).

The challenge is to take advantage of the potential for mutual learning among the entire student population while minimizing any resentment about the extra level of effort required to overcome the additional obstacles. In an attempt to maximize interaction between the two groups (which were, for the most part, geographically separated), the final project for this course required mixed groups, with members in multiple locations.

In the remainder of the article, we will discuss our experience, students’ reactions and the main lessons learned.

SYNCHRONOUS AND ASYNCHRONOUS METHODS

Early reported experiences in distance learning (for instance, Shimizu, 1988; Chiricozzi, 1995) focused on then-emerging classroom technologies. While technology is still evolving, we believe that the main challenge today is in the development of educational models that yield learning benefits to distributed student populations. Ideally, these benefits should be in addition to those directly related to locality (for instance, giving non-traditional students broader access to education).

In recent years, numerous models (Bourne, 1997; Latchman, 1999) have been proposed for incorporating asynchronous methods into engineering education. Such methods nowadays rely heavily on the World Wide Web for dissemination of content as well as for interactions among students and with the instructor. Potential advantages include better tailoring of content delivery to diverse learning styles, anytime/anywhere learning, and the availability of a variety of tools for presenting information, including videos, animation, guided exercises, etc.

Asynchronous methods are particularly appropriate to address the growing demand for continuing education. The rapid pace at which technology evolves requires constant re-learning in most engineering disciplines, and universities are increasingly addressing this need through graduate pro-
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