Chapter 4
Beyond Class Hours: The GIS Lab as a Center of Geographic Education

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ABSTRACT

Much has been written regarding the effectiveness of different teaching styles; however, considerably less has been written about the physical design of computer classrooms and their implications on education. To date, nothing has been written regarding building an informal learning community within a computer classroom, particularly outside of formal class hours. In this paper, the author examines designing an environment in which geography students feel at home, that is, a center of geographic education. Such a center could be defined as a place where students and faculty congregate to create and transmit geographic knowledge. A GIS lab can be such a place if deliberate care and effort are taken to ensure that the lab is multidisciplinary, dynamic, encourages creativity and discourse, and is a think tank for solving geospatial problems. This paper illustrates some proven methods for building such an environment.

INTRODUCTION

The goal of this paper is to describe a time-tested procedure for building a GIS lab which becomes a center of geographic education outside formal class/lab hours. In many ways, this center resembles an informal learning community; GIS is the common thread weaving throughout whatever on which students and faculties are working. Learning communities seek to build new ways for faculty, students, staff, and sometimes people off-campus to interact (Brown, 1994; Fink, 2003; Hord, 1997; Smith et al., 2004). They may take the form of residential communities, linking classes, team-teaching, and/or increased interaction with off-campus people and agencies. One fundamental is that multiple learning styles, and therefore teaching styles, are taken into consideration (Hiltz, 1998; Simon et al., 2007; Sims & Sims, 1995; Smart & Umbach, 2007; Smith et al., 2004). A GIS lab that is a center of learning is also an environment where students willingly congregate, work, socialize, and generally educate themselves.
The author recognizes that this paper is not a traditional research paper and that it reflects the author’s experience in running a GIS lab. Future exit interviews with students are planned to quantify the student’s learning experiences, however, years of data will need to be collected prior to publication. If anyone has any similar experiences they would like to share, the author welcomes the information.

COMPUTER CLASSROOM DESIGN

Much has been written about classrooms, computer laboratories, and their implications on teaching. However, most are written from the perspective of a formal classroom experience – traditional lecture vs. student-centered learning, not as a place where students work on their own time in an unstructured format. Thus, the focus tends to be on the implications of technology on students and faculty and how this then influences education. In particular, the literature compares the traditional “sage on the stage” presentation style with a more student centered, collaborative, and active teaching environment which often relies on technology (Nair, 2000; Halpern, 1994; Kettinger, 1991; Cornell, 2003). Only Czerniewicz and Ng’ambi (2004) discuss time spent in classrooms outside formal class hours; in this case, the authors only examine the computing activities being undertaken by students.

Some have stated that technology-enhanced classrooms are a benefit to education by fostering student interaction with technology, supporting communication/interaction among both faculty and students, and motivating students to learn (Carlson, 2002; Zandvliet & Straker, 2001). However, much of the research provides conflicting results; the real variation in learning may well be primarily due to the skills of the instructor (Bess, 2000) and the interest/learning styles of the students (Hative & Birrenbaum, 2000; Daley et al., 2001). These variables are both very important and very difficult to control.

In addition to the computers themselves, classroom design comes into play when designing a computer lab. Such considerations include size, entrances, windows, finishes, furnishings, acoustics, ergonomics, heating/venting/air conditioning, lighting, and projection requirements (Clabaugh et al., 1996; Callahan, 2004; Jensen, 2005, Chapter 6; Welch, 2005; Zandvliet & Straker, 2001). Students and faculty seem to prefer warm, intimate, and attractive classrooms (Babey, 1991). Comfortable seating helps improve student’s attention spans and their retention of information (Swanquist, 1998).

Obviously, one of the major variables in classroom design is the seating structure. The three most common layouts are a U-shaped layout with all monitors facing the instructor, straight rows of desks (with all students facing the same direction - typically toward the instructor) or a pod layout (a series of roughly circular tables with computers around all sides and students facing the center of these tables) (Niemeyer, 2003). Callahan (2004) is the only researcher to have tried to quantify the respective strengths and weaknesses of each layout regarding student learning, teaching style, and the opinions of both students and faculty. She used a combination of the Computerized Classroom Environment Inventory (CCEI) method (Zandvliet & Straker, 2001), personal observation in the labs, and interviews to evaluate pod versus row oriented classrooms. The study was conducted in two computer labs at the University of Florida. Two different undergraduate research methods classes were observed; all research was directly related to in-class time, not unstructured time in the lab. Her findings indicated that there are relationships between the physical and social settings and student learning, in particular that students working in a pod-style classroom spent more time on-task, had more student-faculty interactions, and were less distracted.