Research on Active Learning Classrooms at the University of Minnesota

I. Background

Over the last several years, interest in new, technology-enhanced learning spaces at colleges and universities across the country has risen at a rapid pace. From Wallenberg Hall at Stanford University to the University of Iowa’s TILE classrooms to Texas Wesleyan University’s classroom, numerous institutions of higher education are designing, building, utilizing, and researching newly configured and technologically equipped learning environments.

The University of Minnesota is positioned as a leader of this new movement. With the opening of the Science Teaching and Student Services (STSS) building in fall 2010, the U of M may have a larger number of Active Learning Classrooms (ALCs) than any other university in the country.

II. ALC Research

Since August 2007, the research and evaluation team in the U of M’s Office of Information Technology (OIT) has been engaged in an ongoing research project centered on new learning spaces. This project seeks to determine to what extent ALCs shape teaching and learning practices, student and instructor perceptions, and student learning outcomes.

i. Pilot phase: Student and faculty responses

Early results showed overall positive reactions to the ALCs from students and faculty. These reactions included an overall enhancement of the student learning experience, a reduction in perceived psychological distance between instructor and students and among students, and praise for the role of the round tables in the ALCs.

ii. Comparison studies: Student learning outcomes and faculty behavior

Two controlled quasi-experimental studies were conducted in order to examine the contribution of ALCs to students’ academic engagement and learning outcomes. In these studies, faculty members taught two sections of the same class, one in a traditional classroom and one in an ALC, using the same syllabus, materials, instructional methods, and assessments. Findings from both studies indicated that, after controlling for all relevant demographic and aptitude-related variables, the ALCs improved students’ engagement in the learning process; helped students to outperform final grade expectations, resulting in improved learning outcomes; and
affected teaching-learning activities even when the instructor attempted to hold these activities constant.

A third comparison study investigated the question whether type of pedagogy used in the ALCs matters to student learning. In this study, a faculty member taught the same course twice in an ALC, using the same syllabus, materials, and assessments. The iteration of the class was largely expository and lecture-based, while the second iteration the instructor took advantage of the room's layout and technology by incorporating more active learning techniques into the class. After controlling for numerous demographic variables, students in the second iteration of the course were found to have outperformed those in the first.

iii. The faculty experience: Role-differentiated responses to ALCs

Since spring 2011, OIT has collaborated with staff from several central units at the U of M in the STSS Research and Assessment Group to evaluate in a rigorous way the impact of the STSS building on the teaching and learning environment at the U of M.

In spring 2012, the group’s work will utilize large-scale student and faculty surveys along with focused class observations to triangulate on the faculty experience teaching in the ALCs. In part this work is a response to research conducted at Stanford University which uncovered a systematic divergence in instructor and student perceptions of the ALC experience. Areas of particular focus will be role-based views of engagement, enrichment, flexibility, effectiveness, and fit within ALCs; the nature and frequency of different types of learning activities that occur in the ALCs; and the utility of the ALCs in helping students to achieve the U of M's Student Learning Outcomes.

III. Resources

Reports, presentations, and assessment instruments from OIT’s Learning Spaces Research project are available at http://z.umn.edu/lsr.