
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.NEXT, 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 collaborated with the Office of Classroom Management (OCM) and other central units to conduct 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 reactions

Early results showed positive responses 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 the 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 first 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. Current research: Mechanisms and Moderators, or How ALCs Work

If newly configured, technology-enhanced classrooms do have a variety of positive effects on teaching and learning, a natural next question has to do with mechanisms. How, or in virtue of what, do new learning spaces have the effects they do? Under what conditions will the impact of new learning spaces be enhanced or mitigated? Current strands of research at the University of Minnesota explore these questions by focusing on:

- The size of ALCs;
- The flipped classroom model in combination with ALCs;
- Changes in the social context of teaching and learning in ALCs.

III. Resources

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- Brooks, D.C. (2012). Space and consequences: The impact of different formal learning spaces on instructor and student behavior. (Forthcoming in the *Journal of Learning Spaces*).
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