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Paul A. Soderdahl
University of Iowa

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Library Classroom Renovated as an Active Learning Classroom

Abstract

Several books and articles about learning space design have recently been published, giving much needed attention to new types of informal learning spaces such as the library commons. This article describes the redesign of a formal learning space: the general assignment classroom. In 2010, one of the University of Iowa's Main Library classrooms was converted to an "active learning" space. The library location was selected as home for this prototype TILE classroom – Transform, Interact, Learn, Engage. The university's goal is to create similar spaces in a variety of sizes and configurations across campus. The classroom is technologically rich, but was designed first and foremost for its pedagogical potential in fostering engaged learning. Ease of use was a primary focus, allowing the technology to fade into the background. Early adopters participated in a faculty institute on active learning and were provided institutional support for reworking their classes to make them more learning-centric. The configuration of the room and the focus on active learning enabled support for larger class sizes while retaining the intimacy and active participation of a small discussion group. The TILE classroom is one strategy in the institution's overall goal of improving student learning, increasing undergraduate retention, and psychologically shrinking the size of the university.

Keywords: active learning; engaged learning; learning spaces; classrooms

Classification: Case Study

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“Learning spaces” – they’re everywhere. With the changing expectations of today’s students, rapid advances in technology, and an increased understanding of how people learn, much has been written about the design of learning spaces, often with a focus on informal spaces – learning commons, learning hubs, study spaces, corridor niches, outdoor learning environments, etc.¹ Some have suggested that new types of learning spaces will lead to whole new strategies for campus design so that “the entire campus becomes an interactive learning device” (Mitchell, 2004).

Libraries, of course, are integral to teaching and learning, and well designed libraries offer a variety of learning spaces, both formal and informal. This article focuses on a redesign of the most traditional of formal learning spaces: the classroom.

The Strategic Promise

For the past several years, the University of Iowa has renewed its commitment to undergraduate student success – forming a “student success team” in 2006, focusing in 2008 on undergraduate retention rates, and in 2009 naming an undergraduate student success task force to shape the University’s strategic plan. By late 2010, student success had become one of the four cornerstones of the University’s new strategic plan, “Renewing the Iowa Promise.”²

This focus on undergraduate retention was a direct response to the financial crisis. For several years, Iowa’s retention rate had remained steady at 83%, putting it at the bottom of the Big Ten. Then-Provost Wallace Loh determined that every 1% increase in retention would generate \$2M, so that a 5% increase over five years could bring in enough funding to create 100 new faculty lines. All parts of the

¹ EDUCAUSE provides several resources that discuss formal and informal learning spaces, particularly in higher education. See, e.g., *EDUCAUSE Quarterly*, Vol. 32 No. 1 (2009) special issue on learning spaces, as well as Oblinger, D. (2006), *Learning Spaces*, EDUCAUSE, Boulder, CO.

² <http://provost.uiowa.edu/docs/plan/RenewingTheIowaPromise.pdf>.

institution were asked to identify ways “to shrink the size of the university psychologically” and create small communities in which first-year students could thrive (UI Faculty Senate, 2009).

Several campus partners came together to identify how the University might create innovative learning spaces that meet the needs of today’s students with the goal of transforming learning and improving success. Representatives from the Provost’s Office, Center for Teaching, Instructional Technology Services, College of Liberal Arts and Sciences, and Campus and Facility Planning formed an executive team to analyze student and faculty needs and identify spaces and technologies that would have a measurable impact. The group looked at similar efforts on other campuses, guided especially by the University of Minnesota’s Active Learning Classrooms (Whiteside *et al.*, 2009), as well as North Carolina State University’s SCALE-UP classroom, and the TEAL (Technology Enhanced Active Learning) room at MIT.

The initiative became known as the TILE project – Transform, Interact, Learn, Engage – and the group settled on eight principles that would guide their efforts:

- Design spaces with flexibility that support various models of teaching and learning.
- Select spaces with reasonable proximity to faculty who are participating.
- Select a variety of room sizes, configurations, and locations.
- Select a variety of course levels (upper level, introductory).
- Select locations that are visible and easily located by faculty and students.
- Do fewer rooms better.
- Keep time and renovation costs in mind.
- Balance number of rooms with cost of individual rooms.

Planning continued even though specific rooms had not yet been selected and funding had not yet been secured.

The Library Classroom

A generation earlier, in the late 1980s, a different set of campus partners came together in response to then-UI President Hunter Rawlings' similar call for a renewed focus on undergraduate education. The group developed a proposal for an "Interactive Information Learning Center" whose mission was to facilitate the integration of new technology into teaching and learning. The center would be located in the Main Library because of its central location and close proximity to information resources. By 1992, that vision became reality with the opening of the Information Arcade, a 6,000 sq. ft. facility containing a 1,400 sq. ft. classroom – the first "electronic classroom" on campus with a computer at each student's desk. The electronic classroom would be designed as a prototype where faculty could turn to on-site support for help with redesigning their courses to take advantage of technology and new media.

This new classroom was rich with technology, but was otherwise unmistakably a classroom in the traditional sense: the instructor's station was positioned at the front of the room, with students evenly spaced in five rows, all facing forward. This design was typical for early electronic classrooms. As Larry MacPhee noted, "When technology entered the traditional classroom, it did not immediately transform instruction. And while the technology lectern is an undisputed part of any modern classroom, it still represents a teacher- or teaching-centered approach to instruction" (MacPhee, 2009).

Within the first few years, a significant investment in video routing hardware and dual projectors allowed instructors to project any student's display alongside the instructor's display, or side-by-side with another student. The instructor could also hand over the keyboard and mouse control to any student, as well as enable groups of students to share a display. In practice, however, the hardware was often used for its more draconian feature: either to blank all screens or to broadcast the instructor's display to all screens so that students couldn't surf the web in the middle of a PowerPoint-driven lecture.

In 2007, construction was completed on a new mobile classroom, immediately adjacent to the original Information Arcade classroom. This new classroom was radically different in many ways, reflecting lessons learned from the inflexibility of the original classroom. Rather than having fixed tables in rows, each student had a movable desk. Since the desks were mobile, the computers needed to be mobile as well, meaning that the laptops could not be tethered by power or networking cables. The room was outfitted as a completely wireless classroom. Students were invited to bring their own laptops, but most did not, electing instead to use the laptops provided on a cart when entering the room.

The instructor's station was intended to be mobile as well. The extensive switching controls for the dual projectors and several audio-visual peripherals, however, necessitated that the instructor's station become a fixed podium. While the desks were on wheels, the general orientation of the room still conveyed a front and back, with the podium and projection screens at the front of the room.

Sadly, the mobile classroom was never fully utilized. Construction delays and a series of technical problems left instructors nervous about scheduling the room. In the end, however, the campus' authenticated wireless network delivered the death blow. Laptops were configured as they would be in a student computing lab where students would enter their net ID to log onto the workstation. This same net ID was also used to authenticate to the wireless network, resulting in a chicken-egg problem: students could not get past the Windows login screen until they had a network connection, but could not authenticate to the network until Windows started its networking service upon a successful login. Students resorted to using one of two shared Ethernet connections, consuming valuable class time just to deal with the technology.

On May 15, 2009, staff from the University Libraries and Information Technology Services met to discuss a number of organizational changes, including how best to repurpose the mobile classroom in light of its low usage. With the TILE project just underway and no TILE spaces yet finalized, this library

classroom became an obvious choice. Much like the discussion 20 years earlier, the central location and close proximity to other resources made the Main Library quite attractive. Since the library is not tied to any academic department, no one program would feel more ownership of the room than any other. Most importantly, the room had just been renovated as a mobile classroom, helping to minimize renovation costs and making this room an ideal candidate according to the TILE project guidelines. The TILE project sponsors quickly charged a team to design and build this new model classroom located next door to the original electronic classroom.

Funding

Coincidentally, UI President Sally Mason announced four days later that the university's appropriation of federal stimulus funds would serve two purposes: \$19.9M would be used to offset budget cuts and offer the university a one-year reprieve to avoid layoffs and furloughs, and the remaining \$15.5M would be distributed based on a competitive process according to several criteria, one of which was for proposals that included innovative methods of instructional delivery. On August 14, 2009, the university announced that a significant portion of that \$15.5M would be dedicated toward building six to 10 active learning classrooms in a variety of sizes and configurations. The TILE planning process was accelerated so that the money could be fully encumbered within the current fiscal year.

Within three months, however, funding was again in peril. The governor instituted a 10% mid-year across-the-board cut for all state institutions. Due to the immediacy of the cuts and a continued intent to avoid layoffs and furloughs, a large percentage of the university's cut was met by unspent federal stimulus funding.³ The university was committed, however, to proceed with building the TILE classroom in the library and having the facility ready in time for the start of Fall 2010 classes. The total

³ Ironically, the governor's across-the-board cut resulted in a situation where the state's FY2010 allocation to the universities fell below the FY2006 level, a threshold set by the federal government as a condition to receive federal stimulus funds. Thus, within three months of the across-the-board cut, a supplemental appropriation was passed to satisfy the federal requirement, ultimately restoring most of the mid-year reversion.

project cost \$290,000 to renovate the space and an additional \$100,000 for the initial outlay of technology.

TILE Classroom Configuration

The classroom is technologically rich, with power and video and networking cables packed behind the walls and under the floor, yet a visitor entering the room for the first time would notice the distinguishing physical layout rather than the pervasive technology. Students are seated at six round tables placed evenly about the room, with the instructor's station located in the middle. There is no obvious orientation to the room; it is unclear if the entry door is in the front of the room, the back of the room, or one of the sides. With several TVs around the perimeter and the round tables, one's first impression is that it looks a bit like a sports bar.

Indeed, round tables are one of the defining characteristics of this type of learning environment. With their SCALE-UP classrooms, NCSU has been a pioneer in research and implementation of spaces like TILE, and their research has shown that round tables are critical, with an optimal size of 7-foot diameter in order to accommodate three teams of three students each. "The ideal size was found after experimentation with half a dozen table geometries. The 7-foot diameter permits table-wide conversations while being both large enough to avoid crowding and small enough for efficient use of space. Tables that are too large actually discourage table-wide discussions" (Beichner, 2006).

Each table in the TILE classroom is equipped with three laptops, with the expectation that each team of three students would share a single computer and display. This, too, is based on NCSU's research demonstrating that a shared computer per team worked better than a computer per student, and that the smaller footprint and lower profile of laptops fostered student interaction (Beichner, 2006). Each individual table is wired with power adapters and cables for video and data. The laptops generally remain connected throughout the class period, since they are valued more for their low profile rather

than their mobility. The hard-wired data connection also avoids the wireless network authentication problem that the earlier mobile classroom endured. Wireless is still widely available throughout the room and can accommodate up to 60 simultaneous connections.

Each table is also equipped with an Extron video switcher and push-button controller connected to a wall-mounted 55" LED TV. Students can choose which of the three laptops will be projected on the display. The LED TVs were selected because they can be mounted flush against the wall which allows ADA-compliant installation for objects attached to walls.

In the center of the room is a wheelchair-accessible instructor's station equipped with a desktop computer, Blu-ray player, document camera, and laptop connection. The computer's display is a 17" widescreen touch panel, which also serves as a controller that dims the lights, lowers the screens, powers on the projectors and TV displays, and gives the instructor full control over which video sources (from the instructor's station or from any of the students' tables) display on the two ceiling-mounted projectors and six TVs. The two projectors are on opposite walls and share a single video source so that students can turn to whichever screen is easier to see. The controller is powered by Crestron's QuickMedia system, which can transmit video, audio, and serial control signals over twisted pair.

The instructor's station interface was designed with simplicity in mind. All of the equipment is stored in rack-mounted cabinetry so that the instructor's work surface is clean and only the touch screen, keyboard, and mouse are visible. The touch screen is ATM-like in its guided instructions. A single button "boots up" the room – setting the lights, powering on all equipment, and configuring the video switching to a default setting with each table controlling its own TV display and the instructor's computer sent to the two projectors.

Overall, the technology in the room is both pervasive and minimalist so that it seems to fade into the background. Visitors have been heard to ask, "So is it the technology or is it just a bunch of round tables?"

Faculty Support: TILE Institute

The first faculty members to teach in the TILE classroom were invited to join a year-long program known as the TILE Institute, providing the faculty members with support and training so that they could make effective use of the space and technology and learn how to integrate principles of engaged learning into their classroom setting. The TILE Institute, co-sponsored by Instructional Services (part of Information Technology Services) and the Center for Teaching, kicked off with a three-day workshop led by Dr. Robert J. Beicher, whose research on NCSU's SCALE-UP classrooms influenced many of the decisions in designing this space.

To be a part of the TILE Institute, faculty members needed to commit to the following:

1. Create course materials that enable students to actively engage and learn in the TILE classroom space.
2. Design course materials to comprise a minimum of four weeks of the semester.
3. Teach the materials at least three times during the next three years.
4. Participate in monthly learning community meetings.
5. Respond to assessment inquiries posed by ITS-Instructional Services and the Center for Teaching.
6. Prepare a working paper of how they incorporated new approaches to teaching (e.g., changing course objectives, course content, assignments, learning assessments, etc.) to be shared with other faculty and made available to the public.

The workshop included orientation and training on the TILE classroom technology, but the primary focus was on helping faculty learn how to adapt their pedagogy to take advantage of the active learning environment. The workshop focused on how the technology and space can be used most effectively to

foster student interaction, enhanced learning, and increased faculty/student engagement. In recognition of the time and effort required, instructors in the TILE institute received a \$5,000 stipend.

Assessment

Lessons learned from the early adopters will influence the additional TILE classrooms now in development. In addition, a second TILE Institute was held for 11 more faculty members who will begin using the TILE classrooms next semester.

Early feedback from students and instructors alike has been positive. “It gives them much more responsibility for their own education. You can’t hide in a class like this. You can’t sit in the back. You have to participate,” said Tom Lewis, a faculty member in Portuguese and Spanish. One of Prof. Lewis’ students added, “I think it’s a better environment for learning. No one feels afraid to speak up. You have your small group and then the whole class” (Morelli, 2010).

More formal assessment is underway, but because the classroom is still in its first semester, there is little yet to report. Given the experience of other institutions and the anecdotal feedback so far, early indications predict positive outcomes, both on student performance and on student response to the learning process. Project planners are gathering more formal feedback through surveys of faculty and students. One study being planned will examine student outcomes to ascertain if student participation translates into measurably improved performance. In addition, one of the TILE classroom instructors is teaching the same class twice – to students in the TILE classroom and to students in a traditional lecture-style classroom – and project planners are especially interested in this faculty member’s experience.

One of the defining characteristics about the TILE project at Iowa is its focused effort on applying active learning concepts to the arts, humanities, and social sciences. Active learning classrooms at other institutions have typically emerged from science disciplines. At Iowa, many of the early

adopters represent departments across the humanities and social sciences, adding to the convenience of locating this prototype classroom in the library. First-round classes have included music therapy, political science, and world languages, in addition to math and computer science. In the second semester, classes will include geoscience, sociolinguistics, educational research, and American history. The university is thus particularly interested in identifying the impact that active learning has on the arts, humanities, and social sciences, as well as on interdisciplinary courses emanating from the university's recent cluster initiatives.

Next Steps for the Library

Despite its adjacency to the library's reference and instruction department, the TILE classroom has not yet been used for library-related instruction. In time, as more rooms come online, this room will be available for library-sponsored sessions, but with the same expectation that library will need to be redesigned so that they incorporate active learning concepts, changing the role of the instructor from "stage on the sage" to "guide on the side."

Equally exciting is the synergy expected as new plans take shape for redefining the library space surrounding the TILE classroom. Planning is now underway for a major redesign of the first floor to create a Learning Commons, providing group and individual study spaces, technology services, information resource services, and academic support services. Construction is expected to begin in 2011 and will likely be adjacent to the TILE classroom on its south side. The area to the north was recently reconfigured to support digital scholarship initiatives and is anticipated to be the locus of the university's newest cluster initiative for digital public humanities. The interrelationship among the Learning Commons, the TILE classroom, new digital public humanities all fit into the university's desire to position the library as a "focal point for academic wellness on campus" (Board of Regents, 2010).

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Author Information

Paul A. Soderdahl
University of Iowa
paul-soderdahl@uiowa.edu
100 Main Library
Iowa City, IA 52242-1420

Paul Soderdahl joined The University of Iowa Libraries in 1995, first as team leader then head of the Information Arcade. In 2000, he became coordinator for information systems and technology and in 2006 was named Director, Library Information Technology.