Steelcase

360

A new learning curve

Steelcase LearnLab™ Environments

Construction is booming on college campuses. Annual spending by colleges has tripled in the last decade. In 2006 alone, over $15 billion in new construction opened on U.S. campuses, the most in any single year in history. The trend is expected to continue as colleges compete to attract students and faculty, while also looking to meet demands for improved technology, facilities, and educational results.

Yet if you take a look around many college campuses today, you'll notice that the typical classroom remains a throwback to the past: desks lined up in precise order, a podium set in front, and a writing board bolted to the wall. Remove the occasional projector and the computer hook-up, and the classroom of 2007 looks pretty much the same as the 1957 model.

Once class starts, students realize soon enough what's wrong with an Eisenhower-era classroom. As one student put it, "our professors tell us to think outside the box, then they put us in a box to do it."

The problem is that the college classroom is now being asked to do more than ever. Students are spending 72% of their time in class-rooms involved in discussion, and 23.4% of their time engaged in group projects. Rarely are classrooms used solely as lecture halls.

Classrooms are overdue for change but there's been little attention focused on their design: What new tools and technology are needed in the classroom? What do instructors and students need to meet increased expectations? How does the classroom work with other spaces on campus?

Steelcase developed a number of hypotheses about what a high performance classroom should be, and built a prototype classroom to test the hypotheses. The results of the study suggest that new design principles developed and tested in the new LearnLab™ Environment can not only help move the college classroom into the 21st century, but also work in practically any college classroom, new construction or renovation.

Research-based classroom design

Built at the Steelcase University Learning Center, the LearnLab "grew out of several years of research we conducted in higher education, at colleges and universities in the U.S. and Canada over the last few years," says Elise Valoe, a researcher with the WorkSpace Futures group at Steelcase. The work of the WorkSpace Futures Team uncovered several key trends that informed the design of the prototype:

Students eat, sleep, and breathe technology.
Teachers may consider wireless networks and cell phone cameras clever new tools in education, but students consider them essential to everyday life and learning.

Collaboration isn't just for profs.
Students are graded individually, but classes often shift between single-focus (lectures) and multi-focus (collaborative work) and frequently involve team and group projects.

Learning occurs outside class hours, too.
More collaborative learning means students meet with peers and teachers in common areas, offices, project rooms, wherever a group can huddle.

Students create as well as consume content.
No longer static sponges absorbing lectures, students use different tools to create content, producing written materials, videos, blogs, multi-media presentations, and more.

Real estate stays pricey.
Every business struggles to hold down this cost; colleges just have more of it to manage. Classrooms frequently double as meeting spaces outside of scheduled class times.

The new classroom design reflects extensive feedback from students, faculty, and administrators. According to Valoe, "we set out to design a space with the best education stages for the instructor and student, a space that not only supported communication and collaboration but really encouraged it. We wanted to enable 'information immersion,' the way groups need to deal with content. We also created educational extension spaces, nearby spaces where groups could retreat for intense collaborative work."
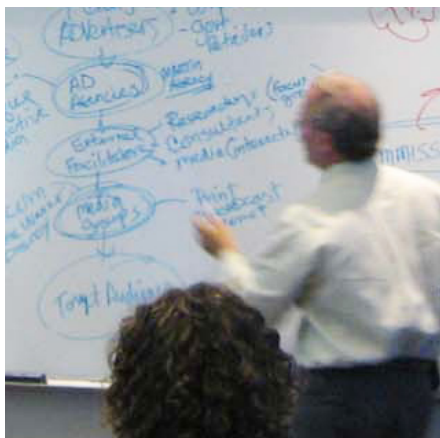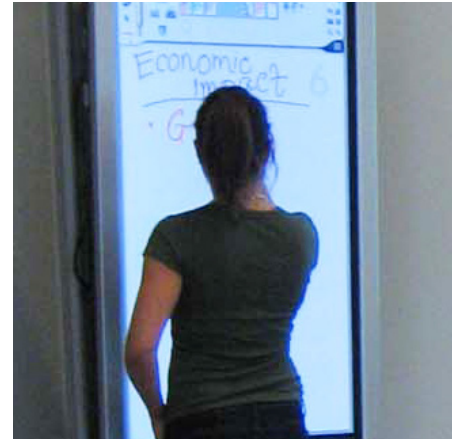
Students take advantage of the LearnLab™ Environments at Steelcase University.
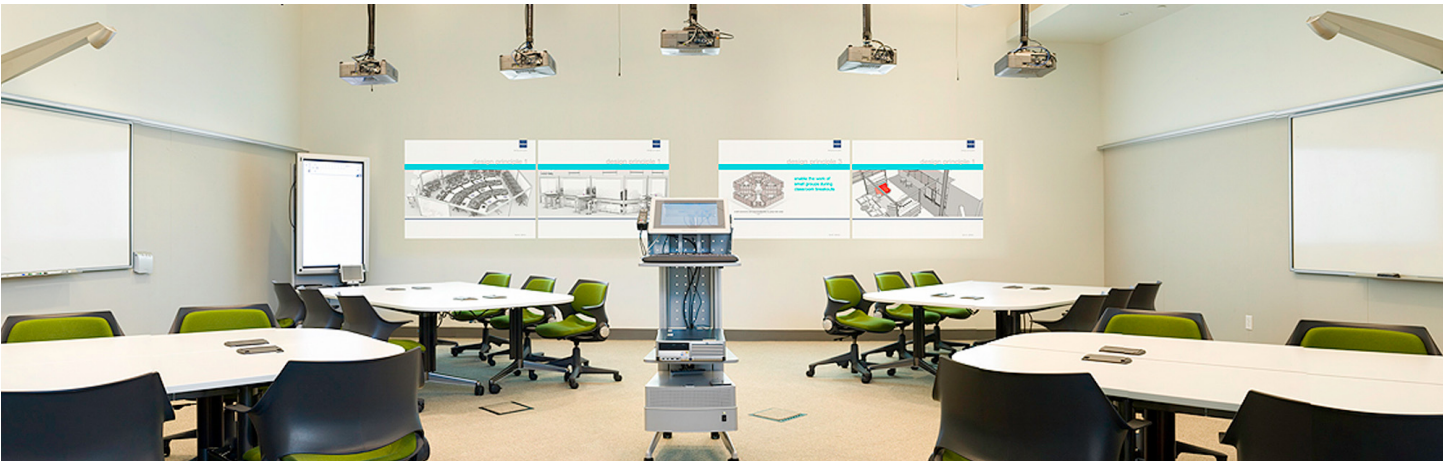
Lessons learned

The LearnLab opened for class in August, 2006 with one advanced course and one entry-level course taught by Rob Frans, an experienced adjunct instructor at Grand Valley State University. The classes ran sixteen weeks and met once a week, three hours per period. Valoe observed the classes, recording 90 hours of documentary video and 250 still photos.

The findings of the study surpassed expectations. After a semester in the LearnLab, Frans doesn't hesitate to call it "the best environment I've ever taught in."

He also saw a corresponding decrease in student absences. "The best attendance rate I've had in five years of teaching these classes. Students were never out for what I would call dubious reasons; they were genuinely reluctant to miss class."

Valoe and Frans say the success of the prototype is largely a result of three important design strategies:

"When you minimize the disruption, everyone keeps their focus."

1. The geometry of the layout is critical

During the study, students were arranged in groups at mobile tables and task chairs, yet the LearnLab can be configured eight different ways and support single-focus or multi-focus teaching styles. According to Valoe, "when you can move from a lecture discussion to small work groups to presentation or any other learning style, and eliminate the segues between those activities, you preserve cognitive flow."

Ceiling-mounted projectors were positioned to project at different angles to three main 5'x4' displays. "Every student has a clear view of at least one screen. There's no back of the room, so there's not a bad seat in the house," says Frans. "I even had a student forget her glasses, but she could still find a screen at the right distance and see everything in focus."

The LearnLab's projectors and projection surfaces also work with the room layout to create multiple stages that break the traditional classroom hierarchy with students lined up to receive a lecture.

The instructor can stand at or near a writing surface, in front of projected content during an informative session, in the center of the space, or near one of the tables. Students can use the same areas during a presentation, discussion, or group collaboration. Seamless transitions from lecture to discussion to collaboration allow the class to preserve cognitive flow: students stay focused on the work at hand even when the activity changes.

"Usually, when you have a class break into small groups, you have students ask, 'Okay, what are we supposed to be doing now?' and it takes five minutes for everyone to get organized and refocused. In the LearnLab, the change to small groups was quick and seamless," says Frans.

"When you minimize the disruption, everyone keeps their focus. You don't have those transitions between activities that cost time and sap the energy out of the classroom."

2. Display content to support immersion and retention

Students have different learning styles. Some learn better through visual imagery, others through the written or spoken word, etc. Whatever the learning style, when information is readily accessible and the students are immersed in it through display, discussion, and interaction, learning and retention are greatly enhanced.

To support content immersion, the LearnLab includes ultra-light Huddleboard™ portable marker boards, a PolyVision CopyCam™ copyboard, TS Lightning™ interactive whiteboard, and a PolyVision Thunder™ Virtual Flipchart™ system. A PolyVision Walk-and-Talk™ Cordless Lectern lets the presenter roam freely.

According to Frans, the interactive white boards were a huge plus. "Every night after class I emailed everyone the notes from every white board, every presentation. So the technology was both right up front, but also secondary to the interaction it facilitated. It augmented the education without getting in the way of it. These tools are all about engagement."

### 3. Provide different spaces for different learning processes and styles

The LearnLab was designed to actively support different learning styles, which are identified by the way the student best learns:
• Visual Imagist – learns through seeing pictures
• Visual Verbalist – learns through seeing words
• Auditory Oral – learns by talking and hearing themselves talk
• Auditory Aural – learns by listening to others
• Motor Mechanic – learns through the use of fine motor muscles
• Motor Kinesthetic – learns through the use of gross motor

In addition to content display and creation tools, students can easily reconfigure the LearnLab's mobile tables and chairs, Huddleboards and other tools. But sometimes they need more privacy, different tools, or simply need to get away.

Students use facilities in different ways. To support the needs of both introductory and advanced students, the prototype included six collaborative spaces designed to support pairs or small groups at work located in the immediate proximity of the classroom. Another twenty-four spaces in the Steelcase University Learning Center, from café spaces to lounge areas, private enclaves, and stand-up tables and stools, were also made available to the students.

According to Valoe, "We found that advanced students, the seniors, were more likely to relocate to some of the other areas in the Steelcase University Learning Center. They used the spaces for collaboration, project meetings and preparing presentations. Essentially the advanced students were seeking out the spaces that accommodated and supported the team-oriented work that their course-load demanded of them."
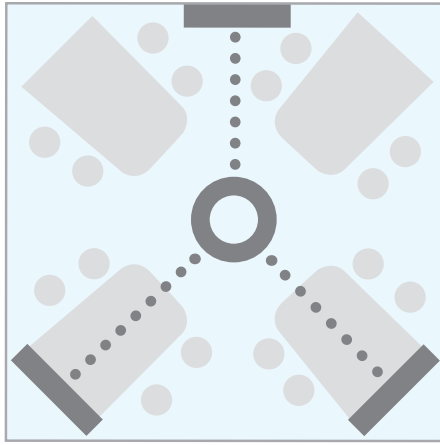
Room Geometry

"After a certain minimum, it's not about the amount of technology you employ," says Valoe. "It's more about how it's positioned and used. The geometry of the triangular projection of three projectors and projection areas is more important than additional projectors."

Surprises, implications, applications

The LearnLab's technology draws questions about its cost, not surprising from institutions facing increased pressure to hold down tuition and other expenses.

"After a certain minimum, it's not about the amount of technology you employ," says Valoe. "It's more about how it's positioned and used. The geometry of the triangular projection of three projectors and projection areas is more important than additional projectors. An early hypothesis we had was that students would move from rows for lectures to groups at tables for team activities. In fact, they stayed in the group arrangement and didn't move the tables at all because the combination of triangular projection and the swivel chairs allowed students to work just as well in a single layout for lecture, discussion, and group work.

"The geometry creates multiple stages. Another hypothesis was the instructor would use the center of the room as a main stage. Didn't happen. He used multiple stages, so there was really no back row and contact with all of the students was easy."

Frans points to the synergy of the Huddleboards and other tools for content creation as another key to a LearnLab Environment. "They support each stage of the learning process: information access, understanding, transfer, and assessment."

For designers and planners wishing to replicate the success of LearnLab, the WorkSpace Futures team is creating application solutions based on the patent-pending design. Davenport University, Grand Rapids, MI, and Dallas Community College in Texas have already incorporated LearnLab strategies on their campuses.

"Colleges have been building learning spaces in residence halls, cafeterias, and commons areas" says Ed Roy, Steelcase sales manager for higher education. "What the LearnLab shows is that not only can the performance of the classroom be radically improved, but also how those in-between spaces –the project rooms, lounge areas, ad hoc spaces– can be designed to be even more effective learning spaces.

"In fact, it's broader than even just higher education. Learning spaces from high schools to corporate training facilities can apply the strategies we've now proven in the LearnLab."

Frans, who has taught at Grand Valley for a dozen semesters and in a wide variety of classroom spaces, needed just one semester in a high performance classroom environment to see the benefits: "The LearnLab gets students more engaged, more excited, and collaborating at a higher level. It's the most powerful teaching environment I've ever experienced."

College and the classroom...
by the numbers

21% Enrollment increase in degree-granting institutions, 1994-2004

57% Graduate school enrollment increase, 1985-2004

1983 Last year the number of men in grad school exceeded the number of women

$9,877 Average cost of undergrad tuition, room & board at a public college, 2004-05

$26,025 Average cost at a private college

$68,505 Average salary for a full-time college professor

$30,625 Expenditure on every student, each year, by a four-year college

$15.1 billion Value of construction completed by colleges in the U.S. in 2006

1st Historical ranking of that amount as an annual total, in U.S. history

780 sq. ft. Area of the LearnLab

720 sq. ft. Size minimum required for a high school classroom in South Carolina

32 Number of students the LearnLab will comfortably accommodate

8 Number of ways the LearnLab can be configured

360: Designed to inspire and inform Architects and Designers, 360 explores the latest in workplace research, insights, and trends.