



Capitalizing on Opportunity: Creating a Facility for Innovative Teaching and Collaborative Learning at Emory University

Bob Albrecht, ECAR
Bob Bender, ECAR
Robert B. Kvavik, ECAR and University of Minnesota

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4772 Walnut Street, Suite 206
Boulder, Colorado 80301
www.educause.edu/ecar/

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The mission of the EDUCAUSE Center for Applied Research is to foster better decision making by conducting and disseminating research and analysis about the role and implications of information technology in higher education. ECAR will systematically address many of the challenges brought more sharply into focus by information technologies.

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Preface

The EDUCAUSE Center for Applied Research (ECAR) produces research to promote effective decisions regarding the selection, development, deployment, management, socialization, and use of information technologies in higher education. ECAR research includes

- ◆ research bulletins—short summary analyses of key information technology (IT) issues;
- ◆ research studies—in-depth applied research on complex and consequential technologies and practices; and
- ◆ case studies—institution-specific reports designed to exemplify important themes, trends, and experiences in the management of IT investments and activities.

From its most recent research, ECAR has published a comprehensive gathering of information on student use of technology in higher education in the *ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control*.¹ It was undertaken in four phases, described below.

Literature Review

A review of the relevant literature and a review and comparison with ECAR's 2003 study *Faculty Use of Course Management Systems* undertaken at the University of Wis-

consin System² helped us define the study's major elements and create a working set of hypotheses.

Online Survey

We conducted a quantitative survey with 4,374 respondents (from an initial sample of 9,350 freshman and 9,050 senior students) at 13 higher education institutions: Colgate University; Drexel University; University of California, San Diego; University of Minnesota, Crookston; University of Minnesota, Twin Cities; University of Wisconsin–Colleges; University of Wisconsin–Eau Claire; University of Wisconsin–La Crosse; University of Wisconsin–Madison; University of Wisconsin–Milwaukee; University of Wisconsin–Oshkosh; University of Wisconsin–Stout; and University of Wisconsin–Whitewater.

Interviews

We conducted interviews with 132 students in focus group settings at six institutions. We also interviewed 23 administrators who support student IT on their campuses.

Case Studies

Researchers conducted this in-depth case study to complement the core study. We as-

some readers of this case study will also read the primary study, which provides general context for the individual case study findings. We undertook this case study to examine the thinking and redesign of the Computing Center at Cox Hall at Emory University and the ways in which it supports innovative teaching and collaborative learning.

ECAR wishes to thank the Information Technology Division (ITD) staff along with the faculty and students at Emory University who generously shared their time, thoughts, and insights with us. We are especially indebted to Donald E. Harris, vice provost for information technology and CIO, for making the necessary arrangements for our visit, and to key members of his staff for so generously sharing their time and insights with us: Alan Cattier, director, Academic Technology Group; John Ellis, director, Academic Technology Group, and interim director, Technology Services; Kim Braxton, manager of the Computing Center at Cox Hall; Wayne Morse, director, and Shannon O'Daniel, coordinator, at Emory's Center for Interactive Teaching (ECIT); and José Rodriguez, director, Language Center.

Introduction

A key finding of the core study notes the importance of supporting faculty and students in using technology to improve learning:

[I]nstitutional leadership must establish a funded priority for faculty technology development using effective practices as guidelines. They need to establish appropriate rewards and incentives. Technology innovation, skill, and use in the classroom should be considered in merit, promotion, and tenure decisions. In the absence of such incentives, many faculty members are unlikely to change how they teach and what teaching tools they use. Nor will they believe that technology makes a difference.³

We chose to examine Emory's Computing Center at Cox Hall precisely because it seems

to address part of this key finding by meaningfully supporting students in the use of innovative technology while leading to collaborative learning. We weren't disappointed in what we found. Moreover, we discovered that Emory provides a good deal of training at Cox as well as in other settings and programs.

The Computing Center at Cox Hall

Cox Hall lies at the center of the Emory campus; its clock tower is billed as "a distinctive symbol of one of Emory's most popular community gathering spots." The first floor houses a bustling food court; on the third floor are a conference center and several dining rooms. In late 2001, following considerable discussion and recognition that student and faculty technology needs were rapidly changing, CIO Don Harris sponsored a project to renovate an old computer lab on the second floor of Cox Hall, with Alan Cattier, director of the Academic Technology Group, as the responsible leader.⁴ The new Computing Center at Cox Hall—a multiuse, state-of-the-art technology center for learning and teaching⁵—opened on November 1, 2002.

The old computer lab consisted of rigid cubicles with side-by-side workstations, all configured in much the same way. Designed in 1991 and built in 1992, the lab was considered state of the art when it opened but appeared old and outdated by 2002. The basic design was plain, with a simple drop ceiling, fluorescent lighting, and cubicles with four workstations and workspace for four people. Don Harris observed, "Drab, utilitarian is a good description." The lab accommodated 80 workstations, but by 2000 rarely more than 20 to 30 students occupied them at any one time. Replaced on a three-year cycle, the workstations included mostly standard PCs and Macintoshes, and they were used for basic electronic communications and productivity functions.

Today, the lobby outside the entrance to

the 11,070-square-foot facility houses a wireless computing lounge where students can meet informally with friends and collaborators, check e-mail, surf the Web, or simply relax for a moment before entering the high-tech center. The lab itself is divided into several areas, each of which can serve a variety of purposes. A mix of computer platforms including PCs and Macintoshes, monitors, whiteboards, and a high-definition plasma display station support the great variety of activities occurring in the lab.

To the far left of the center's entrance is a space for students to do collaborative work. It features a rear-projection interactive whiteboard with a touch-sensitive surface and software that can record and save notes to let students work together easily. Soft seating enhances the area's relaxed feeling. Closer to the entrance is a more formal presentation space equipped with whiteboards, where students may rehearse presentations and receive suggestions from fellow students. This area also has a wireless access point.

Farther into the center is a service desk where students may check out laptops for individual or class use. The service center also has a master control panel for delivering audiovisual feeds to all areas within the center—computing and collaborative work zones, classrooms, and even the café and gallery. Feeds from DVD, CD, VHS, and cable sources can be delivered to single or multiple areas simultaneously. Of course, service desk staff are available to answer questions, direct students to other resources, and schedule individual training. The service center also provides PDF guides⁶ with easy-to-follow instructions for using Apple's iMovie, scanning and editing images with Adobe Photoshop, creating Web pages with Macromedia's Dreamweaver, and burning CDs on either a Mac or a PC.

Opposite the service desk are multimedia pods, each equipped with an Apple G4 computer with cinema display, JVC mini-DVD/VHS

and Sony DVD/VHS decks, and multimedia software. These pods are designed to facilitate the easy creation of media projects. Behind the pods is a bank of printers serving the entire center. Opposite the service desk are several "teaming" areas, each equipped with Dell Optiplex computers with flat-panel dual displays; Epson scanners; and word processing, desktop publishing, and statistical software. These work areas have various configurations, some with some soft seating. Behind this section, at the far right side of the largely open space, is a small nine-seat conference room where private meetings can be held behind closed doors but in full view through floor-to-ceiling glass walls on all "sides" of the oval space.

While the center is largely an open space, interesting use of color separates the distinct areas. Many of the walls are finished in fairly dark, rich shades of rust that match paneling used in other spaces. Most structural supports are painted bright yellow, providing an interesting contrast. The ceilings have some light areas, notably over the service area, but otherwise are painted in deep blue and purple tones. The floors are partially covered with light mauve carpeting that unobtrusively contrasts with the darker ceilings and with exposed-wood walking aisles. Lighting is provided from above as well as from a bank of windows. These design elements convey a sense of having entered an almost magical place.

Most of the center's furniture is mobile and can be moved about easily. The café/gallery serves for less formal conversations and the display of student artwork. There are also a few classrooms. One staff member remarked, "We did an electronic survey of faculty and students—with 900 respondents. Faculty wanted classrooms, students wanted soft seating. So we gave them both." Alan Cattier drew attention to what he calls "design manipulation"—doors leading to the classrooms that require faculty and students to walk through a number of spaces where students are engaged

with their own work and with each other. José Rodríguez, director of the Language Center, commented, "Communication is very different in person; otherwise you might have done your study on the Computing Center at Cox Hall by looking at it online and asking questions by phone or e-mail." He added, "Students needed places to work; they like Cox because it's comfortable." The facility's design encourages formal and informal interaction among students, and comfort is not a trivial concern in making this happen.

The Computing Center at Cox Hall is indeed impressive for the variety of its workspaces and configurations, its state-of-the-art hardware and software, and the clear sense of design that permeates the area. But is there evidence that these facilities actually lead to innovative and collaborative work? How do we assess success with such a facility? In an article published on the first anniversary of the center's opening, in the February 2, 2004, edition of *Emory Report*, a weekly newspaper published for faculty, staff, and students by the Office of University Communications, a division of the Office of Public Affairs, Don Harris raised several insightful questions:

But how does one judge the success of such a major renovation project? Is success measured by its popularity, as evidenced by more than 100,000 student and faculty entrances in its first year? Or by the utilization of classrooms by 18 courses that met regularly in the center last semester? Or is it judged by comments from prospective students and visitors that, with the center, Emory is offering something unmatched by its peer institutions?⁷

To attempt to answer these questions, we need to provide some background about Emory University and IT at Emory.

Emory Background

Emory College was founded by the Methodist Church in Oxford, Georgia, 35 miles east

of Atlanta, as a private institution in 1836. In 1854, with the founding of the School of Medicine, Emory began to establish itself as a major professional and research institution. In 1915, the main campus was relocated to the Druid Hill neighborhood, now some 15 minutes from downtown Atlanta. The establishment over the years of the Woodruff School of Nursing, the Chandler School of Theology, the Goizueta Business School, a law school, a graduate school of arts and science, and most recently the Rollins School of Public Health has made Emory one of our country's major research institutions, ranked for more than a decade by *U.S. News & World Report* among the nation's top 25 universities.

Emory today has a total enrollment of about 11,600 students, with some 6,300 in undergraduate programs, including 600 students at Oxford College, the university's original site, which offers a two-year liberal arts program. Most Oxford students go on to complete their undergraduate degrees at the main campus; the associate's degrees awarded by Oxford College are included among the other undergraduate degrees. Emory does not accept many transfer students, and with a good retention rate, half the Oxford students receiving associate's degrees in any given year go on to complete their undergraduate degrees at Emory.

Of the 3,319 degrees awarded in 2002–2003, the most recent year for which full statistics are available, 1,555 were in the graduate and professional schools. Emory has an excellent reputation in medicine and other health sciences. The medical school has six departments ranked in the top 10 nationally, and the university is home to the National Institutes of Health-funded Yerkes National Primate Research Center. Emory is well situated in Atlanta along the Clifton Corridor, close to the U.S. Centers for Disease Control and Prevention and the American Cancer Society.

IT at Emory

Given the concentration of graduate and professional programs at Emory, support for technology is highly decentralized. Some schools and centers have their own technology organizations.⁸ The Information Technology Division (ITD) is charged with providing systems and support services to enrich education, extend collaboration, and strengthen research at Emory. ITD delivers and supports audio and video streaming media, e-mail, course conferencing, teleconferencing, and Internet videoconferencing services. The division also manages computing labs, campus kiosks that provide e-mail access and other services, and technology-rich classrooms. Alan Cattier observed that “as you put all this technology out, you need to support it.” For example, the Blackboard course management software hosts 1,300 active courses, approximately 400 of which are used each semester. Faculty and students need training and support in using this system, so ITD provides just-in-time training for faculty and students, individually and together, focused on curricular issues. From these and other curricular and cocurricular activities arose the need for a facility like the Computing Center at Cox Hall.

ITD is as much concerned with support and training as with the technology itself. It’s fair to say that most software and many hardware decisions are made on the basis of educational need rather than the other way around. In 2000, for example, a Goizueta Business School student thought it might be interesting and fun to get together with other students to make movies. They made five-minute digital movies in five days. In February 2004, Emory hosted Delta’s Campus iMovie Fest in Atlanta’s Fox Theatre, where more than 100 teams competed to produce the best digital movie. The student-led contest, now in its fourth year, has evolved from an on-campus Emory College event to a citywide competition, with participants from numerous

Atlanta-area colleges and universities. This cocurricular extravaganza would not have been as successful—or perhaps even possible on such a scale—without the convenient availability of iMovie software in the Computing Center at Cox Hall.

Now in its third year, EduCATE—the Educational Conference on Academic Technology at Emory—provides a forum for teaching and research using IT resources. This year’s event featured presentations from 15 faculty members representing nearly all of Emory’s schools. The two-day event highlighted the many ways innovative new technologies can enhance teaching and research. These presentations were followed by hands-on tutorials in applications such as PowerPoint, Dreamweaver, iMovie, and Photoshop, as well as Emory’s course management system—Blackboard—all conducted in the Computing Center at Cox Hall.

Don Harris sees a spirit of collaboration across campus. Leveraging people resources well is essential to supporting innovation. “One of the keys to success here at Emory,” Don remarked, “is the real partnership between faculty and ITD staff.” Carole Meyers, director of academic computing in Emory College, responded, “Because of this spirit, the faculty attitude is so open [that] there’s no hard line about ‘you are the technologist,’ and this is meaningful to our people who feel they’re partners in the process.” This spirit of cooperation and collaboration has grown over time and seems to result from a concerted effort to make it happen by creating and taking advantage of new opportunities for using technology to support teaching and learning.

Even before Harris assumed the position of vice provost for information technology and CIO in March 2001, Emory’s Center for Interactive Teaching (ECIT) had begun concentrating on supporting innovation with technology. Located in the Center for Library and Information Resources on the second floor of the Woodruff Memorial Library, ECIT consists of an interac-

tive classroom, a digital content production suite, and several Web development stations. As further support for collaborative activities, ECIT is colocated with two other technology centers at the library, the Electronic Data Center and the Lewis H. Beck Center for Electronic Collections and Services. All three centers support teaching and research.

ECIT offers manifold services for faculty, students, and researchers. Faculty can learn how to create online class content for use within Blackboard, and all users have access to programs for video editing, Web page creation, digital assignment creation, image scanning, text scanning, and videoconferencing. ECIT hosts lunch-and-learn events, regular classes, and summer institutes. Faculty and students can sign up for individual learning sessions, and ECIT's Web site includes intensive instructions.⁹ Wayne Morse, ECIT director, and Shannon O'Daniel, ECIT coordinator, encourage faculty and students to meet for training, especially for implementing Blackboard. Their idea is "to bring faculty and students together in a facility where their skills can be aligned." And this, of course, encourages students to use the facilities in the Computing Center at Cox Hall. "Here," said Kyle Peterson, a professor in the School of Medicine, "students use the facility very much on their own."

Indeed, ECIT essentially created the need for a facility like the Computing Center at Cox Hall. ECIT typically hosts three summer programs. Two three-week programs include 10 to 12 faculty (and an equal number of graduate partners). One week-long program is designed for 12 to 14 postdoctoral biology fellows. The faculty who participate in ECIT's summer programs represent various disciplines, including anthropology, English, religion, theology, psychology, nursing, Russian and East Asian studies, and biology. ECIT also serves students: during 2002–2003, it hosted more than 600 scheduled student consultations related to the use of digital

technologies as part of an academic project. ECIT staff have also taught students how to use specific technologies for course-based faculty assignments.

The Emory College Language Center (ECLC), established in 2000, also depends on technology for innovative teaching. Visitors to the ECLC homepage first encounter this statement: "The Emory College Language Center is dedicated to international education by promoting the teaching and learning of languages. We provide students with opportunities to experience and understand world cultures both on campus and beyond."¹⁰ The ECLC mission statement is concerned with the alignment of educational goals with technology, chiefly by enhancing "the effectiveness of language learning and teaching through the integration of language pedagogy and technology."¹¹ Located in Woodruff Library, the Language Center works with the Emory College language departments, ITD, the library, and the Center for Teaching and Curriculum "to facilitate and support language instruction and to advance our understanding of language pedagogy."¹²

The Language Center includes a language lab and electronic language classrooms and offers faculty development workshops and individual faculty consultation. The center also provides online access to audiovisual materials and has a multimedia digitizing facility. Through ITD's cable television program—Emory Television—the center also provides access to cable TV programs that support language learning and cultural exchange. At the beginning of each school year, José Rodríguez, director of the Language Center, schedules orientation sessions for both faculty and students.

From Planning to Building

The primary motivation for transforming the space in Cox Hall came from several ITD staff members' observations that students us-

ing ECIT often worked together in small groups on assignments, and the space and furniture were making that difficult. This led Harris and his staff to begin asking students and faculty about whether this activity stemmed from assigned group projects or just impromptu work sessions between students. Harris commented, “We found both to be true. The goal of the center was then to create a space with design, furniture, and technology that facilitated collaboration between students, and between students and faculty.”

In effect, Harris was capitalizing on an opportunity afforded by the alignment of technology with teaching and learning at Emory: “We had a window of opportunity. The need for this kind of facility existed. We had some pockets of funding, and it was before the university entered into financial constraints.” The objectives for the renovation of the space in Cox Hall clearly reveal a plan based on alignment with the ITD strategic plan:

Use of IT resources by faculty and students is growing at an exponential rate. ITD-supported services like Learnlink and Blackboard are having a positive impact not only in the teaching/learning process but also in furthering the development of an intellectual community. While many IT resources are “virtual,” physical spaces that encourage collaboration are also important. As the trend toward teams or small groups working together continues, we must provide technology-rich environments where this work might take place. This is the goal of this redesign project. Several goals in the 2001–2002 Information Resources and Technology strategic plan link to this project. Among them are:

- ◆ Strategic Goal #3: “Seek creative uses of IT resources to support the academic mission of the University.”
- ◆ Objective #2: “Take an enterprise approach to providing IT resources in the learning environment.”

- ◆ Academic Objective #2d: “Redesign the ITD footprint in Cox Hall in support of innovative use.”

Because the ITD space in Cox Hall is strategically located on the campus, it is an ideal place for this new type of resource center. We foresee a high degree of use for the space as students make their way between the student center, residences, classrooms, the Library, and food services. And because we see this space as being a “social” space as well as a technology-rich space, we believe it will be a nice complement to the Information Commons and technology centers in the Woodruff Library.¹³

IT took the initiative in planning for the Cox Hall renovations, but “early adopter” faculty also supported the effort. Interestingly, many ITD employees, including Harris, also have served as faculty and can offer personal insights on the use of technology in teaching. Harris took the proposal to the provost, the president’s cabinet, and the budget committee for approval. But first he did his homework, more by observing the environment and interacting with students and faculty than by reading books on pedagogy. The ITD planning team spoke with several schools that had created different types of spaces and visited several campuses to look at labs, libraries, and classrooms that recently had been built or renovated. Harris also took staff members to conferences where they could hear presentations on design and talk with architects. Attendance at an annual conference held by the Society for College and University Planning proved particularly inspiring. “Key to our own project,” said Harris, “was having a great architectural group who listened to our vision and worked with us in every aspect of achieving that vision.”

Throughout the planning process, Harris and his staff worked closely with Emory’s Division of Facilities Management, particularly

the Interior Design Group, and an outside architectural firm they engaged to work on the project. Not only did they discuss hardware placement and the software programs needed, but they also paid great attention to nearly every detail of the project. They held lengthy discussions of color design, with a good deal of give and take. ITD was skeptical of some proposals but open to others. Working groups formed to address particular concerns. In short, designing the Computing Center at Cox Hall involved a great many people. And, from the start, Harris recognized that staying within budget—what in working sessions he called “the hard line of budget”—was absolutely critical to the project’s success.

Measuring Success

It’s not easy to determine how well the Computing Center at Cox Hall has succeeded in its goal of supporting innovation and collaboration. In fact, there remains much to learn about what and how IT adds to learning. The ECAR research study this case study accompanies, for example, found that while IT adds materially to student convenience, increases interactions among students and faculty, and enhances student control over important elements of the learning endeavor, only 12.7 percent of students surveyed said technology improved their learning.¹⁴

Emory has just begun to collect data that might help to demonstrate success. Nancy Bilwise, a senior lecturer in the psychology department who uses Macromedia’s Flash software to create student exercises, has begun measuring learning in her classes, and the results so far are promising. Still, finding or devising instruments to determine success with technology in higher education is difficult.

Responses gathered from faculty, staff, and students at Emory, however, suggest that the Cox Center is successful in supporting innovative teaching and student collaboration. Dave Brewington, a student in the Graduate

School of Arts and Science, commented that the Cox Hall facilities gave him “the ability to go out and find data sets on any number of subjects, and this is a real change. I feel like I’m doing ‘real’ research.” Josh Hale, a graduate student in the School of Theology, told us, “Everything I do is either in Greek or Hebrew, and there are ways of doing things on computers here in Cox that are far more advanced, especially in lexical work.” During our visit, José Rodriguez showed us Emory’s online language study resources. More than 18 languages are regularly taught at Emory, including not only Greek and Hebrew but also other languages requiring special fonts, such as Arabic, Chinese, Japanese, Russian, and Sanskrit. Rodriguez told us the Cox Hall center provided a much-needed facility for students to continue language study on their own. Indeed, nearly half of the 18 courses taught in the center in fall 2003 were in foreign languages.

Some students, of course, were skeptical. Kareem Khalifa, a graduate student in philosophy with teaching experience using Blackboard, commented that “not much was happening in the way of innovation.” And he felt that Blackboard was fairly invasive, “very much like ‘Big Brother.’” On the other hand, he enjoyed doing research online in Cox Hall and being able to send an e-mail to the author of an article he’d just read. He also agreed that perhaps practitioners in the discipline in which he was working were reluctant to get involved with technology. By contrast, Graham Wells, an Emory College undergraduate, was excited about the computing center. Talking about the iMovie Fest, he spontaneously said, “You should see some of the videos.” He added, “One of the things this center really does is—the technology does support innovative and collaborative work.”

Another student reported that “learning here really is peer to peer,” and then he told us about two students he had observed.

“Someone was in here working on a journeys of reconciliation project, sitting next to another student he didn’t know, and suddenly they were sharing information and looking at what the other one had on their screen.” This program apparently is popular at Emory. Organized by the Office of the Dean of the Chapel and Religious Life, its mission statement specifically calls for engagement in collaborative learning:

The mission of the Journeys of Reconciliation is to provide members of the Emory community the opportunity to cultivate relationships of education, partnership, service and friendship with communities around the world. By engaging in collaborative learning with these communities and supporting their work of reconciliation, we open ourselves to possibilities of hope and healing.¹⁵

Technology supports much of this collaborative learning with communities around the world, and students at the Cox Center find themselves working closely with their peers at home.

Faculty we met with were equally enthusiastic about the new center. Nancy Bilwise, who has developed several courses using Blackboard, talked about how she had learned to use Flash to create course content. She was pleased with the faculty collaboration she found: “There’s a forum at Emory for learning how to use technology. Its reason for existence is to help faculty learn how to do what they want to do.” Steve Everett, a professor in the music department, told us Cox was ideal for his music composition students, noting that almost all music composition today is taught with technology. Michael Neville, a School of Nursing professor, agreed that technology was indispensable to teaching in his discipline, and once more the Cox Center provided support without which his students could not complete their work. When meeting with faculty, we were impressed with their comments about

how helpful ITD staff were in addressing their needs, and staff we met with were equally enthusiastic about working with faculty.

Don Harris, who participated in some of our meetings with faculty and staff, obviously was pleased with the supportive responses we heard. Later, he told us of other ways to measure the computing center’s success. “After the facility was finished,” he said, “all the groups involved in the renovation project—the trustees, the deans, the president’s cabinet—asked to hold meetings in the center. Some of these people even stayed on to try out some of the technology. Many of the trustees weren’t aware of everything that can be done with technology.” Today, the admissions office uses the Cox facility to attract students. “For younger siblings,” Harris observed, “this is their one experience in taking older brother or sister to school when they see what’s available at Emory.” The center provides other campus visitors with a showcase for design and for the use of IT to encourage student interaction.

Lessons Learned

Responsive initiatives to faculty and student needs can facilitate beneficial relationships for central IT organizations. Faculty and students require two types of support: training and technical support, and facilities in which to work and learn. An aggressive IT organization can be instrumental in identifying such needs, refining them by listening to the constituents, and initiating plans for support personnel and facilities. Emory’s ITD exemplifies how each of these steps can be carried out effectively.

Education of Senior Administration

The work undertaken to educate the president, provost, and CFO was critical to securing permission to move forward. This educational process, and the time it required, also created

an environment that minimized problems once the project was under way.

Distributed Resources for the Project

Funding for this project was redirected from ITD's budget with the provost's knowledge and permission. This allowed for a great deal of flexibility in addressing project needs while also ensuring a sense of project "buy-in" among the campus community.

Creating a Gathering Place

A common criticism about technology is that with all its "virtual communities," it actually acts as a barrier to people meeting and interacting in person. Deans in particular can be especially sensitive to this. By serving as a destination space where students come to meet, talk, and work in groups, the Cox Center clearly addresses the concern that technology reduces person-to-person interaction.

Alternative Support

At Emory, faculty and students have a necessary choice of alternative support systems. ECIT and the Cox Center offer one-on-one training, group training, online resources, and class (course) meetings. This array encourages users to seek support that meets their technical, comfort, and convenience requirements, and it permits individualized support for special needs of any description.

Attentiveness to Faculty and Student Needs

The ECIT facility, a traditional support facility with rows of computers, works effectively and efficiently. But students particularly recommended a facility more attractive to them and more aligned with their preferences. ITD listened to those preferences and planned the Cox Center to meet technical and support needs while offering an environment supportive of collaboration.

Surveys Provide Necessary Feedback

Informal communication among help desk staff and faculty or students provides necessary feedback on normal operations, but carefully constructed surveys are required to obtain information for facility planning. Student preferences for soft chairs that are also readily movable led to one of the Cox Center hallmarks that students appreciate: its open areas, glass walls, and easy access to equipment facilitate instruction and incorporate comfort preferences.

Serving Faculty Appropriately

While many faculty support needs differ little from students' needs, helping a faculty member move to an effective skill level in Blackboard, for example, often can best be accomplished through one-on-one coaching. Similarly, training in the use of specialized software can often be accomplished only by individual support. The ECIT facility continues to be the ideal location for such training at Emory.

Just-in-Time Training

Some curricular designs depend upon collaboration between faculty and students. Such collaboration often is difficult to achieve in traditional classroom settings. The facilities available at the Cox Computing Center, as well as at facilities such as ECIT and the Language Center, together with the resident support staff, can provide training for faculty and students together in a class setting. The just-in-time training done this way, in these sorts of facilities, assures that faculty and students are working together in a collaborative effort.

Faculty/Staff Partnership

Support staff often don't know precisely what particular faculty members may need for an existing course, let alone one in the

planning stages. Faculty, on the other hand, seldom know how various facilities, technologies, or software can facilitate a course. Responsive discussions in a facility conducive to innovation can lead to more effective learning. But the partnership between faculty and staff can in itself be highly productive when both are receptive and open.

Innovation as Process

At Emory, the Language Center and ECIT provided staff, faculty, and students with models for developing the next-generation facility—the Cox Computing Center. The organizational agility to develop an additional facility while maintaining the previous centers' effectiveness serves the whole institution. Such a history suggests that the campus will develop effective innovation for wireless and other emerging technologies. Innovation, when introduced through campus partners' cooperation, becomes an effective and supportive process.

Conclusion

The idea for the Cox Center emerged from observations at Emory's other IT centers and in its various training programs. The center facilitates student IT use by addressing the recommendations of Colleen Carmean and Jeremy Haefner, who identified a set of effective practices and issues to bear in mind when teaching with a course management system.¹⁶ Their analysis focuses on how to use a CMS to create an effective learning environment, but their recommendations can also apply to most classroom uses of technology. For them, technology does not and should not drive pedagogy. It can accommodate deeper learning principles and in so doing help create effective learning environments. On the basis of research about learning, they identified five principles necessary for deeper learning, which occurs when learning is:

- ◆ social,
- ◆ active,
- ◆ contextual,
- ◆ engaging, and
- ◆ student owned.¹⁷

The Cox Hall Center was designed specifically to create a social space where students could take charge of their own learning. Often it's not pedagogical theorizing but rather careful observation of student practices that stimulates innovation. Students might not arrive on campus as technology experts, but given the space to work together, they can share information and overcome perceived barriers to using technology.

Much of the computing center's success, as well as that of other initiatives at Emory, comes from ITD staff members' agility and nimbleness in identifying the need for new facilities and from their easy rapport with faculty, administrators, and students, which allows them to initiate discussions leading to effective change. In addition, many staff members, some of whom also teach, appear to have had an intuitive vision of what a first-rate facility in their environment could look like. One thing also leads to another when people work together, and unique opportunities often arise—opportunities that might be missed if everyone was not so attuned to taking advantage of them. For example, some faculty were eager to have students use laptops in the Cox classrooms. Students often would summon other students to come look at their work on a computer screen, an activity that could more easily be accomplished by carrying a laptop over to where someone else was sitting. While it was always ITD's intention to provide wireless access throughout the center, access points had to be implemented more quickly than planned to accommodate demand.

In a recent ECAR Research Bulletin, Bryan Alexander made a straightforward case for how innovation can occur:

Wiring classrooms for Internet connectivity created new opportunities for teaching and learning. Adding wireless classrooms broadens these opportunities while also bringing about new pedagogical challenges.¹⁸

Given Emory's penchant for change, attentiveness to demand, and ITD staff agility, the institution will likely move on to widespread wireless computing, which will provide for even more innovation and collaboration. The most impressive evidence for the success of the Computing Center at Cox Hall was the enthusiasm with which students, staff, and faculty talked about the collaboration they engaged in and experienced whenever they used the facility.

Endnotes

1. R. B. Kvavik, J. B. Caruso, and G. Morgan, *ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control* (Boulder, Colo.: EDUCAUSE Center for Applied Research, Research Study, Vol. 5, 2004), <http://www.educause.edu/ir/library/pdf/ecar_so/ers/ers0405/>.
2. G. Morgan, *Faculty Use of Course Management Systems* (Boulder, Colo.: EDUCAUSE Center for Applied Research, Research Study, Vol. 2, 2003), <http://www.educause.edu/ir/library/pdf/ecar_so/ers/ers0302/>.
3. Kvavik et al., op. cit., p. 81.
4. See <<http://www.emory.edu/ITD/COX/index.html>> for information on the project along with many documents and access to a "QuickTime Short of Cox 2002."
5. A virtual tour of the center is available at <<http://www.it.emory.edu/cox/>>, and a large set of slides is available starting at <http://cio.emory.edu/Presentations/CCC_archive_1/index.htm>. Emory has also published a glossy full-color brochure illustrating the computing center's features.
6. See <<http://it.emory.edu/showdoc.cfm?docid=1672&fr=1000>>.
7. See <http://www.emory.edu/EMORY_REPORT/erarchive/2004/February/feb%202/2_2_04focusIT.html>.
8. See <<http://it.emory.edu/showdoc.cfm?docid=1494&fr=1033>> for links to each of these schools and centers.
9. See <<http://www.ecit.emory.edu/>>.
10. See <<http://languagecenter.emory.edu/>>.
11. See <http://languagecenter.emory.edu/about_us.html>.
12. Ibid.
13. See <<http://www.emory.edu/ITD/COX/index.html>>.
14. Kvavik et al., op. cit., p. 52.
15. See <http://www.emory.edu/REL_LIFE/131.html>.
16. C. Carmean and J. Haefner, "Mind over Matter: Transforming Course Management Systems into Effective Learning Environments," *EDUCAUSE Review*, Vol. 37, No. 6, 2002, pp. 26–34.
17. Ibid., p. 29.
18. B. Alexander, *M-Learning: Emergent Pedagogical and Campus Issues in the Mobile Learning Environment* (Boulder, Colo.: EDUCAUSE Center for Applied Research, Research Bulletin, Vol. 2004, Issue 16, 2004), <<http://www.educause.edu/asp/doclib/abstract.asp?ID=ERB0416>>.