



Supporting E-Learning at Colgate University

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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 technology (IT) in higher education. ECAR research includes

- ◆ research bulletins—short summary analyses of key 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.

While technologies offer many new learning possibilities, they also present new challenges. Institutions must adapt pedagogical practices, ensure technical proficiency, and develop and maintain a reliable and robust technical infrastructure to use e-learning effectively. These demands translate into a host of new instructor and student support requirements that institutions must address.

To help institutions achieve these goals, ECAR and IDC conducted research to learn

about the evolving student and instructor support requirements for online distance-learning courses, hybrid courses, and traditional courses that leverage technology. The research examines the issue from the perspectives of support providers and support users. From the provider perspective, ECAR examines central resource organization structures, resource availability and effective practices, and the challenges presented by e-learning's increasing popularity. From the user perspective, ECAR examines the e-learning course creation or adaptation process, challenges faced, and the effectiveness of support received for the process. The research also examines instructors' and students' technical proficiencies and support requirements. This research proceeded in three phases.

Phase 1: Online Survey

ECAR conducted an online survey of the EDUCAUSE membership to develop a baseline on the state of e-learning courses and their central support activities in higher education. It received 274 valid responses, which represents 18 percent of the surveyed EDUCAUSE membership. The survey's general topics included:

- ◆ online distance learning, hybrid course offerings, and student and faculty participation;
- ◆ student and instructor technical proficiency, e-learning activities, and support requirements;
- ◆ availability of instructor training and technical, course/curriculum, and support resources;
- ◆ infrastructure and organization of support resources; and
- ◆ current and future challenges to meeting support requirements.

Phase 2: Telephone Interviews

We conducted the second-phase interviews to drill down into the “whys” and “hows” of central resource support models for e-learning. We recruited interview candidates from a group of willing respondents from the initial survey; EDUCAUSE staff and an ad hoc advisory committee comprising EDUCAUSE members involved in e-learning also helped with recruiting. We selected candidates on the basis of several criteria, including reputation as a leader in e-learning, percentage of hybrid and/or online course offerings, and degree of faculty and student involvement in e-learning. During January and February 2003, ECAR invited 23 institutions to participate in qualitative interviews, and 19 institutions accepted the invitation.

ECAR and IDC created interview guides to solicit in-depth opinions on the issues touched on in the survey research. IDC and ECAR analysts conducted telephone interviews with support provider representatives (for example, a manager from the central IT department, a manager from the instructional technology unit, or a representative from the institution’s faculty resource center) and support user representatives (such as the

academic senate chair of the instructional technology committee or an appropriate dean or department chairperson) from each institution.

Phase 3: Case Studies

For the case study field research, ECAR and IDC chose six institutions from among the qualitative research participants and other institutions that have significant e-learning initiatives or have implemented noteworthy central e-learning support models. The case studies seek to gain a deeper understanding of the various central e-learning support models and, by extension, what has worked well and what needs improvement. We assume that readers of the case studies will also read the main report, which incorporates the case studies’ findings within the report’s generalized context.

ECAR wishes to thank the leadership of Colgate University for their time, assistance, and diligence in support of this research. In particular, we thank David Baird, director, Innovative Technology Solutions for Learning; Tim Borfritz, director of Enterprise Technology Solutions; Adam Burnett, associate professor of geography; Jack Dovidio, provost and dean of the faculty; Charles A. Dana, professor of psychology; Judy Doherty, director, Technology Education; John Gattuso, director, Network Services and Operations; David Gregory, chief information technology officer; Karen Harpp, associate professor of geology; Ian Helfant, assistant professor of Russian; Dierk Hoffman, professor of German; Padma Kaimal, associate professor of art and art history; Ross Miller, director of the Desktop Support Team; Ray Nardelli, instructional technology specialist; and Claudia Servadio-Coyne, student technology administrator.

We hope that readers of this ECAR case study will learn from their experiences.

Introduction

Colgate University's educational experience provides an unusual blend of strong personal connections and technological sophistication. Its small student/faculty ratio encourages personalized learning experiences, and its rural location in upstate New York promotes a strong sense of community among faculty, students, and staff. And many alumni remain closely connected to the institution after graduation. The university even maintains a "hello" tradition to greet any passerby on campus as a means to know others and to welcome strangers.

Complementing these personal ties is a very strong commitment to technology. Colgate views technology as a means to connect to the outside world, remain in touch with its community, and provide enhanced teaching tools. This commitment has resulted in the creation of a robust technical infrastructure that includes a totally wired campus with a high-speed network, videoconferencing facilities, and high-technology classrooms. Future plans include the creation of a "digital campus" to enable anytime, anywhere access to information. Once completed, the Case Library and Center for Information Technology will let students and faculty combine learning and technology through access to the university's primary research collection and the use of high-technology classrooms, sound-isolated audio and video production studios, and digital multimedia work rooms all under one roof.

Colgate's e-learning vision also blends these two commitments. Its focus is to use technology to enhance students' classroom experiences. To complement lectures and textbooks, many faculty members incorporate Blackboard, Web sites, mobile computing, multimedia, and videoconferencing to create new study tools, experiences, and hands-on projects that

add new dimensions to students' academic experience. But personal connections drive its e-learning development. To help them create successful teaching models, faculty members rely primarily on technological and pedagogical instruction and consultation from the Innovative Technology Solutions for Learning (ITSL) group. In turn, satisfied faculty members primarily drive the university's e-learning infusion by sharing their experiences and tools with colleagues. This case study overviews Colgate's e-learning activities and support resources, with particular emphasis on its one-on-one e-learning support.

Case Background

Colgate University is an independent, liberal arts, baccalaureate-class institution with 2,800 undergraduate students and more than 250 faculty members. It has four academic divisions: humanities, natural sciences and mathematics, social sciences, and university studies. The institution also has a small graduate program leading to the master of arts in teaching, and a few select students can enroll in master of arts programs in academic subjects.

The institution manages its e-learning support activities centrally in its information technology services (ITS) organization. One of Chief Information Technology Officer David Gregory's actions since arriving in April 2002 has been to reorganize ITS to reflect the area's priorities: enterprise technology solutions, ITSL, desktop support, and network services and operations. Gregory also appointed a director of communications to interface with the Colgate community.

"Strategically, I wanted to focus more resources on teaching and learning to align with our liberal arts mission," Gregory explained. "Our staff was bogged down with the nuts and bolts of computer support, and I needed to find a way to free

up resources without adding incremental positions.” Gregory outsourced help-desk support, enabling him to fold the academic division-based technology support analysts (TSAs) back into a general desktop support team. He folded Media Services and one TSA into ITSL, expanding the area from two full-time IT staff to nine full-time IT and three part-time library faculty members. The ITS areas are currently dispersed in different buildings across the entire campus.

Drivers of E-Learning at Colgate University

According to President Rebecca S. Chopp, in her introductory note on the university’s Web site, “Colgate combines the intimacy of a liberal arts college with the depth and breadth of a research university. We are small enough to be a real community of students, faculty, staff, alumni, and parents, but large enough to offer more than 50 concentration programs in traditional departments and interdisciplinary fields.” Jack Dovidio, provost and dean of the faculty, and Charles A. Dana, professor of psychology, elaborated further. “Most liberal arts colleges have an enrollment in the vicinity of 1,800 students. For the students, Colgate is a place that is bigger, but not quite a research institution. For faculty, it is a place where we focus strongly on teaching, but we expect more in terms of research and we have higher standards in terms of research. We are a liberal arts ‘university’—a phrase we are using more and more.”

Institutional Vision Intertwines Technology and Teaching—and Fosters E-Learning

Technology plays an important role in achieving this vision. “Because we are bigger than most liberal arts colleges, technology

enhances intimacy with faculty members,” Dovidio explained. “Because we are a small college, technology is important in facilitating the kinds of research that faculty members do. It gives us an opportunity to be both the liberal arts college in terms of intimacy and the large research institution in terms of collaboration and productivity. I think that is where technology has served us very well.” Technology is recognized as a priority, one that originates from the trustees, who have an active technology committee.

Colgate’s remote location, institutional vision, and strong sense of community all spurred the development of its robust technical infrastructure. Located in Hamilton, New York, an hour’s drive from any major airport, the university uses technology to compensate for its low accessibility and to keep itself connected to the outside world. Colgate pushed cellular and cable TV service providers to install a cellular tower and high-speed-bandwidth service into this very rural community.

Connectivity is also strong on campus. ITS spent the early 1990s installing a local, robust technical infrastructure to access on-campus information. When the Case Library installed online databases, it wired academic buildings to provide faculty access. In 1993, ITS installed SCT’s Banner enterprise resource planning (ERP) system, prompting the institution to wire its administrative buildings. Student connectivity resulted from a telephone service contract with AT&T for the institution’s dormitories, which required AT&T to install a fiber-optic network for the dorms. Today students are “connected at the pillow” with a high-speed network and cable TV access in each room. The network is in its fourth generation, using a switched gigabit backbone to provide 100 Mbps to the desktop.

Colgate's strong sense of community nurtured this technological vision. Administrative and faculty turnover tend to be low, fostering a long-term vision and implementation viewpoint. When students graduate, their commitment to the institution remains strong. "Alumni are very active technology supporters," Gregory explained. "They really push, and they know what they want in terms of technology. Their interest stems from their lifelong connection with the university," cultivated during their undergraduate years. Technology enables the many alumni who want to maintain contact to participate in institution classes and activities.

For example, a growing interest is to use e-learning to connect alumni with current students. Dovidio cited courses like Karen Harpp's "The Advent of the Atomic Bomb." Alumni who are World War II veterans or defense industry executives discuss with students—via the course's electronic discussion board—experiences and issues relating to the dropping of the atomic bomb during World War II. At the semester's end, the class holds a live reunion with some alumni participants, which the students record to create a video of the class experience. Economic courses about the stock market pair up alumni and students to explore market difficulties.

The institution primarily uses technology to enhance students' face-to-face time with faculty members, not to promote distance learning. Dovidio explained, "I think we had a recognition early on that we are going to live and die with intimate academic experiences with students, and that technology can enhance intimacy rather than create distance. The philosophy that dominates ITS is that you have to work with faculty to understand their classroom activities, how to enhance and improve them, and to work

collaboratively with them." The institution does not plan to develop any distance-learning programs except to enhance its off-campus study group experiences.

Technology uses in the classroom take many forms:

- ◆ Ian Helfant, assistant professor of Russian and chair of Colgate's Committee on Information Technology, uses proprietary software called Transparent Language to create electronic flashcards of Russian vocabulary words. The students can use the electronic flashcards on their computers, and the program keeps track of the words they know. Students also complete Russian assignments using a software application that records their voices and converts them into MP3 files, which the students submit to Helfant via Blackboard's digital drop box.
- ◆ Karen Harpp, assistant professor of geology, teaches a course in volcanology in which the students work with Web sites and communicate live with people in the field about active volcanoes. She uses PowerPoint presentations in a real-time setting to simulate a volcanic eruption, forcing students to analyze the data and react to the situation by setting alerts, determining evacuation strategies, and interacting with actors portraying local government officials.
- ◆ Dierk Hoffman, professor of German, uses videoconferencing extensively to connect his students with other German students, teachers, and authors around the world. One class followed the creation and production of a German play with a scanned, cut version of the play script, digital photos of figurines of the costume designs, videoconferences with the director and players to analyze the play, and a video of an actual performance.

- ◆ Padma Kaimal, associate professor of art and art history, uses a “virtual carousel” of digital images of art work as a study aid for her students.
- ◆ Margaret Maurer, professor of English, uses digitized recordings of Shakespeare’s plays in her classes that are streamed through her Blackboard course so that students can access them whenever they study.

Colgate believes its solid technology infrastructure and uses in the curriculum appeal to prospective students. “I think for students of this day and age, technology is an attraction for them,” Gregory said. “If they go to a place that has first-rate technology, it appeals to prospective students. And it is probably not something that they will find at every liberal arts college.”

New Resources Provide E-Learning Technical and Support Infrastructure

One primary e-learning driver was the adoption of the Blackboard course management system (CMS) in spring 2000, which provided a standardized platform for faculty members to incorporate e-learning in their classes. David Baird, ITSL director, estimated that 35 to 40 percent of Colgate’s courses use Blackboard currently.

Around this time, Karen Leach, former CITO, and Baird, who previously worked on a similar project at Lawrence University, submitted a grant proposal in October 1999 to establish a joint library and information technology team, called the Collaboration for Enhanced Learning (CEL). The goal was “to provide coordinated support to faculty who wish to rethink course and curriculum approaches and to use emerging technology to enhance student learning.”¹ The partnership between the library and ITS was natural, according to Baird, building upon their similar activities: instructional librarians infuse

research skills into the curriculum, and ITS infuses the curriculum with technology. In March 2000, Colgate received a \$260,000 grant from the Rockefeller Brothers Fund to hire a director and instructional technology specialist for CEL, with the university gradually funding the staffing costs over the next three years. CEL is located in the library, not at an ITS location.

As discussed earlier, CEL evolved into the ITSL group in May 2003 to put more resources toward teaching and learning. The addition of Media Services and a TSA with film and multimedia background will enable ITSL to become more coordinated and efficient in its e-learning support.

Faculty Acceptance Broadens E-Learning’s Penetration

While waiting for the Rockefeller Brothers Fund grant, CEL became involved in an institution-wide pilot during spring 2000 that introduced faculty members to Blackboard’s capabilities. The Asynchronous Learning Pilot Project investigated the use of online asynchronous threaded discussion in a liberal arts setting. It involved 25 faculty teaching about 700 students in 34 courses across Colgate’s four academic divisions.

The pilot motivated some faculty members to use Blackboard in classes. But as Helfant explained, “There is absolutely room for the faculty member who wants nothing to do with technology and wants to focus on the in-class experience.” So the initial challenge was to convince faculty about the benefits of using e-learning in the classroom—to encourage them to adopt it, but not mandate it. ITSL has relied on informal or grassroots approaches, not formal policies. “We do a lot of things in stealth here, if you want to call it that,” Baird said. “ITSL helps those faculty members who wish to be enabled, and we let them tell their colleagues about it. We get more of

our business accomplished through word of mouth and gentle leading than through any top-down kind of approach.”

Dovidio concurred. “There is a lot of social comparison at small schools like ours. Faculty members see what their colleagues are doing. When they see a really good idea, they want it. Innovation spreads not top down, but by creating models, models that work, and having other faculty see those models work. It is truly evolutionary, rather than revolutionary. We are not retraining all our faculty, we are planting seeds.” That is what ITSL does—plants individual seeds of technology in classes throughout the faculty community, tailored to a faculty member’s individual interests.

Another important driver is sustainability, which helps faculty members realize that long-term benefits will come of their initial learning-time investment. Over the years, ITSL has worked hard to foster long-term relationships with faculty members. Given the university’s high faculty retention, each additional faculty member who adopts technology in a class further demonstrates e-learning’s sustainability.

Supporting E-Learning at Colgate University

E-learning presents a new set of challenges and support requirements. To address them, ITS enhanced its technical infrastructure and developed various instructional and support resources.

Key E-Learning Support Challenges

David Baird believes, “The biggest challenge is to enable faculty and students to do what they need to do without doing it for them. Every time I get a request for help, it is an opportunity to teach someone how to do something themselves. Then when they call again, I’ll be helping them do

something more complex—that’s progress. We pick applications that are easy to learn, easy to support, and scalable so all of those things can happen.”

Timing is another key support challenge. “The impact from our view is one word: immediacy,” stated Ross Miller, director of the desktop support team. “The immediacy with which support staff can determine and fix problems has really ramped up in terms of importance, especially if a crisis occurs during a class.” Technology extends access hours and potential support needs. “As you well know, students and faculty live in different time frames that intersect only for rather short periods,” Miller continued. “Students begin their activities later in the day—around 7:00 or 8:00 p.m.—after most of the support staff has gone home.”

E-learning compounds the complexity of tech support. “Previously, most questions were basic ‘how-tos’ for application support,” Miller explained. “A support person could memorize vast amounts of information about ‘how to do a hanging indent in Word.’ Now questions often focus on systems and systems access, but you can’t memorize information to answer that type of question. While the support person needs more technical knowledge, the ability to do in-depth technical research and to understand what you found is a new skill. It dramatically increases the amount of time that you have to spend per question. It sets the stage also for employee burnout.” That can be a problem in a rural area, where the institution is located, because of the limited pool of qualified job candidates.

Another support challenge derives from the variety of computers that students use. “I receive many help requests that are due to any number of unknown things,” Baird said. “So when a student can’t use the virtual carousel in an art history class, I have to ask, ‘What browser are you using? What version?

What is your operating system?’ And I have to ask because any of those elements could affect his problem. It is really a more labor-intensive diagnostic process.”

Faculty Versus Student E-Learning Support Needs

While basic technical training still represents an important e-learning support need, both faculty members’ and students’ technical competency continues to climb. New faculty members possess computer skills developed during their studies or previous teaching experiences; more faculty members adopt technology as it evolves into a mainstream application. “Gradually, the overall level of technical literacy is rising,” explained Helfant. “We all take for granted that we have to use e-mail. And I think this is happening with our course management system; the majority or substantial portions of the faculty are using it to one degree or another.”

Faculty members report rising student technical competencies, too. “Students hated using computers in the class when I started teaching 20-plus years ago,” Dovidio said. “Obviously, the software was not sophisticated and they had no background. Actually, the challenge has switched the other way, to get students to appreciate books.”

Baird cautioned, however, that not every student is technically savvy, though students do ramp up quickly. “I still think there is an assumption that all students grow up with technology and they know it all already. In fact, we have a great spectrum of abilities and comfort levels with technologies in our students.” Harpp concurred, noting rising student technical proficiency in her classes. “Before, if you wanted students to create a PowerPoint presentation, you had to teach them. I had to teach only one student

this year,” she said. “The students create fabulously complex presentations. They know how to scan, how to import, how to do everything, but the slides can be nasty. There is too much content on the slide, so I can’t read it. Now I am teaching something different—not how to use the technology, but how to use it well.”

Baird noted that students’ expectations differ today, too. “When we began to use our course management system, the seniors resisted it. It was not the Colgate they knew and signed on to. They disliked talking to classmates online. It has been almost four years since we installed it, and students’ attitudes have rolled over; it is all they know.”

Infrastructure Resources for E-Learning Support

Baird believes that the university’s technology infrastructure—its fast local network, media servers, CMS, and other technology assets—facilitates the growth of technology use in class. Ease of use and scalability play a key role for many e-learning-related infrastructure resources and projects:

- ◆ *Course management system:* Ease of use was important in CMS selection. “We targeted our course management system to the mainstream users,” Baird said. “A key criterion was the system’s ease of use, because you can’t build it just for the early adopters. You have to keep those in mind who have a lower pain threshold.”
- ◆ *Application selection:* ITSL prefers to use off-the-shelf applications, not custom-built ones. “It goes back to the scalability issue,” explained Baird. “We can’t redocument and develop things; otherwise, we would not have time to help people.” ITSL selects their applications on the basis of research and faculty/staff feedback and com-

municates its choice of fully supported applications to faculty and staff prior to their adoption.

- ◆ *Smart classrooms:* Currently 100 percent of the classrooms are wired to the ITS network, and 75 percent are equipped with technology, including a data projector (usually a Mac or a PC, depending upon the department preference), a VHS or DVD player, and a cassette deck.
- ◆ *Video:* The university network can deliver the bandwidth to support full-screen video. As video gains popularity in classes, ITS is addressing specific issues like subnetting its network to handle video streaming. Faculty members can link videos to their Blackboard site, enabling students to view them from any computer on campus, including in their dorm rooms.
- ◆ *Wireless communications:* ITS is installing wireless networks in selected classrooms, dining halls, and common areas such as the Case Library reading room. Over the next three years, the institution will install wireless in other areas on the basis of user demand.
- ◆ *PC availability:* Gregory “guesstimated” that 95 percent of students own a computer. For students who don’t own a PC, ITS operates eight public labs accessible to all students. There are also several department-managed labs, which are specially configured for department-level needs. Students must save work on Zip disks or floppies because there is no network storage. Though Gregory feels students without a computer are disadvantaged, Harpp noted that she “never had a student who couldn’t complete an assignment due to lack of computer access.” The university is wrestling with the issue of mandatory computer ownership.

Colgate recently derived greater institutional efficiencies by integrating its SCT Banner ERP and Blackboard CMS systems in March 2003. One immediate benefit is that registration changes (drops/adds) made in the Banner system are now recorded in the CMS automatically. Previously, ITSL had to manually populate each course’s Blackboard site with student enrollment information, and faculty members needed to add and drop registrations, actions which are no longer needed. The integration also lets Baird gather more accurate statistical information. “We have a significant physical education division,” he explained. “Their courses are not geared for Blackboard, and they do not use it. With the Banner integration, I can query by division. Before, I had to manually deduct the physical education courses from my Blackboard usage calculations.”

Baird also uses the Banner information for training purposes. He is able to “query Banner to find out who is teaching what class in which classroom,” he said, and can also “offer targeted tutorials about working the technology in that room to those faculty. It helps us to catch more faculty before the semester starts or early in the semester.”

E-Learning Training and Instructional Support Resources

As the primary group for training and instructional support, the ITSL group—previously the Collaboration for Enhanced Learning—offers several resources. Baird estimated that in 2002, “20 percent of Colgate faculty attended one of the scheduled workshops, while 40 percent have attended a one-on-one session.”

One-on-One Support

One-on-one support is the cornerstone of ITSL’s e-learning support efforts for several reasons:

- ◆ *To supplement workshops*—“People will take a workshop, and although we think we are teaching that technology to them, they are just becoming acquainted with it,” Gregory said. “What then needs to take place is a lot of one-on-one assistance. It does not have to be in long stretches, but assistance to supplement their overview knowledge of a technology and their direct application into a project.” ITSL offers the technology workshops individually to faculty upon request.
- ◆ *To adapt training and consultations to instructors’ specific technical proficiency and problems*—“I think every case is different and every person is different,” Baird explained. “Some are at the stage where they want to paste a picture into their PowerPoint presentation. Others want to incorporate a little digital video into their lecture.”
- ◆ *To address specific pedagogical issues*—“The one-on-one work we typically do with faculty is not scripted,” explained Judy Doherty, director of technology education. “It is typically some vague idea, something the faculty member wants to try to achieve pedagogically in the classroom. They have no idea how to do it. They don’t ask us to scan 2,000 images; they’re asking us how do they use the images in a course.”
- ◆ *To enhance courses in general*—“Our job is to give the faculty member two or three options and a couple of good places to start,” stated Baird. “I don’t try to transform their course entirely the first time. They get more committed to technology by doing it in an evolutionary method. It does not overwhelm the instructor in what they have to learn and the time commitment required to add technology.”

Other Training Resources

- ◆ *Workshops*—ITSL offers hour-long, half-day, or full-day workshops throughout the year primarily for faculty members. Subjects range from basic Blackboard and application training to more advanced activities like creating Web sites. Baird noted that workshop topics have evolved from topics like “Introduction to the Possibilities” for faculty who were unfamiliar with computers and technology to courses focusing on scanning, digital photography, and remote network access, as well as the basic how-tos.
- ◆ *Student classroom training*—Although ITSL focuses on supporting faculty, they will, at a faculty member’s request, instruct students in class about PowerPoint, FrontPage, or other applications required for students to complete their assignment. “In some classes, Web authoring for a project or class replaces writing a paper on a topic. We focus very specifically on the assignments which the professor has asked the students to do,” Doherty explained.
- ◆ *Technology studio*—ITSL holds a drop-in studio every Friday from 1:00 to 4:30 p.m. for faculty to discuss their ideas and appropriate technology solutions.
- ◆ *Online training*—ITSL also offers Element K online training, though Doherty noted it is not heavily promoted so that emphasis remains on one-on-one activity.

E-Learning Technical Support Resources

Unlike at some institutions, tech support at Colgate is part of the ITS organization, which prompts ITS to proactively factor support into projects rather than reactively address it after a project’s launch. Colgate offers the following technical support resources:

- ◆ *Expanded CMS support*—Students and faculty members access the CMS around the clock, prompting ITS to designate it a critical service for the on-call group to manage. ITS also builds redundancy into its critical systems—including the CMS—to ensure reliability, using three servers and multiple network connections that can take over if a server or link goes down.
- ◆ *Desktop tools*—ITS uses Netopia's Timbuktu, a diagnostic software program that enables the support team to see a faculty member's desktop screen (if given permission) and control it in real time over a telephone line when installed on a faculty member's desktop. Network users can also determine current Internet traffic levels online and whether buildings are off the network, and they can access and search the FAQ and How-To online database for information.
- ◆ *Outsourced help desk*—ITS began to outsource its help-desk operations in January 2003 to Advantage Communications in Prince Edward Island, Canada. Advantage provides a customized and Colgate-dedicated staff of certified Microsoft and Mac support professionals. Call hours are 7:00 a.m. to 7:00 p.m. Monday through Friday and 5:00 to 10:00 p.m. on Sunday. ITS provides back-up support for any questions Advantage cannot answer.
- ◆ *Student-Operated User Resource Center (SOURCe) peer support program*—SOURCe is a group of 35 to 40 student workers who provide on-call support to their peers in their dorm rooms. It operates Monday through Friday from noon to 10:00 p.m. SOURCe students attend training before the beginning of the fall semester and can investigate hardware, software, and networking issues.
- ◆ *Microsoft Office assistant peer support program*—Starting in the spring 2003 semester, ITS hired students to offer Microsoft Office application support in the library. The students are certified Microsoft Office specialists, receiving a wage increase each time they pass one of the four certification exams.

Funding E-Learning

While information technology is a high institutional priority and is admittedly well funded, ITS does strive to maximize its budget. For example, lower costs and higher performance enabled ITS to cut replacement desktop PC costs in half. The savings let Gregory outsource the help line, and as a result, he said, "We got the equivalent of four new positions because we reassigned those help line staff to other areas."

Best Practices and Lessons Learned

Jack Dovidio referred to e-learning adoption as an evolutionary process. Adoption is not mandated but rather is spread informally through either faculty word of mouth or ITSL outreach. ITSL works one-on-one to enhance courses through technology, either reactively to address a specific faculty member's need or proactively to address an emerging institutional need. Ray Nardelli, instructional technology specialist, broadly estimates a 60/40 split between faculty approaching ITSL and ITSL approaching faculty with project ideas. Whatever the impetus, an overlying goal is to apply any course enhancement tools developed from any project across the entire Colgate faculty community as appropriate.

Using One-on-One Support to Build an Effective E-Learning Teaching Model

One example of a proactive ITSL project is the use of PDAs in a geography class. ITS

is currently installing wireless networking at various campus locations, which encouraged Nardelli to pilot an in-class project using PDAs to develop effective wireless teaching practices.

First, Nardelli researched other in-class PDA applications. He learned about Wake Forest University's ClassInHand PDA software and ESRI's ArcPad software, which has interfaces for the global positioning system (GPS) units to communicate with PDAs. This, in turn, germinated an idea for using PDAs in a geography class. Nardelli approached Adam Burnett, associate professor of geography, with his idea to use PDAs in his spring 2003 geographic information systems class. The course teaches students to use digital maps for display and analysis. "As part of that class, we work with GPS units," Burnett explained. "The students go out with the GPS units, construct digital maps, bring them back, download them to the GIS software, and work with the maps in the desktop environment."

Burnett was intrigued with Nardelli's idea, especially after learning about the existing ArcPad software, and agreed to participate. "I saw many opportunities for enhancing the theoretical/technical aspect of the class," Burnett said. "Ray also explained other curricular benefits." ITS issued a Dell Axim PDA to every student in the class and created a wireless environment in the classroom and the geography lab. Students typically downloaded maps to a disk or CD in the geography lab; now they download the maps and other course material—exercises, other text documents, and the in-class PowerPoint presentations with Burnett's notes and graphics—onto their PDAs in class using the wireless network.

Burnett and Nardelli formed a team to work on the pilot. "To the best of my

abilities, I take the technical research out of Adam's hands," Nardelli said. "We talk about an issue, I research it, and I present Adam with a solution. . . . I want Adam to think curricularly and pedagogically, to use the tool. I don't want him to feel bogged down with the technology." Burnett concurred that his time investment is acceptable. "Ray has worked quite a bit behind the scenes; this project is certainly not taking away from my scholarly time or course preparation time."

Nardelli estimated that he spends eight to 10 hours per week on the project. First he had to learn how to use a PDA and research higher education PDA applications to discuss potential classroom applications with Burnett. Nardelli conducted two lectures' worth of PDA instruction for the students, attended 75 percent of the classes, and helped convert Burnett's course materials into a Web-acceptable format for PDA display.

To prepare for the course, Burnett reviewed his course's exercises, lectures, and approaches to determine where he could integrate these new ideas and the GIS functionality of the PDA and GPS into the course. For example, Burnett designed an outdoor exercise where the students work with PDAs and GPS units to navigate to six unknown points on campus using a downloaded map, modify the map in the field, add data to the map, and bring their maps to the desktop via the wireless environment to construct a new map.

Burnett is pleased with the success of the GIS applications, which are what he cared about. Nardelli now wants to encourage him about the more generic applications (such as in-class quizzing or feedback, or testing) so that at the end of this pilot he can have a model to apply across different course types.

Scaling an E-Learning Teaching Model

Though the wireless pilot strives to create a new teaching model for an emerging technology application, faculty have also adopted more mature instructional technologies. One example is asynchronous discussion. About four years ago Helfant incorporated online discussion boards in his Russian literature classes, whereby students answered a question daily about their reading assignments. Helfant considers their participation part of the class discussion portion of their grade. He reports that a significant minority resented the exercise when he introduced it: "They felt it was more work for them; they were not used to the idea," he recalled. "Now students seem to take it all for granted that I have the right to factor this exercise into their semester grade."

Helfant's work and strategies encouraged Padma Kaimal to incorporate discussion boards in her classes. Kaimal is pleased with the experience also. "The students must do it, but they can say anything that they want. It gives them the confidence to engage about something which they might not understand. The students feel this is a safe space. When they walk into class, they are fired up and ready to go."

Now Kaimal is ready to expand her technology use. A presentation by Baird about videoconferencing inspired plans to conduct a videoconference with a colleague at Duke University to discuss poverty in India. The students will read his research paper in preparation and participate in an online discussion board. She wants her colleague to participate, too, so he can read their comments beforehand to tailor the videoconference accordingly.

One-on-One Support Scaling Strategies

Whether sessions are ad hoc or planned, the one-on-one support model endeavors to build teaching models and scale their application. Just as important are faculty members' word of mouth and ITSL's outreach activities to promote faculty adoption. It works at Colgate, where a small faculty population and a centralized e-learning support structure facilitate its successful implementation. But the potential exists to scale the one-on-one support model at other institutions.

Strategic Projects

ITSL proactively approaches faculty to participate in one-on-one projects in conjunction with an emerging need or IT initiative. For example, the asynchronous threaded discussion pilot ran shortly after the university implemented its CMS. Nardelli developed the wireless PDA pilot in conjunction with ITS's plans to install wireless networking around the campus. Both projects sought to

- ◆ create faculty interest in a new technical tool by presenting it in practical context, and
- ◆ produce an applicable model that faculty members can adopt without significant time investment.

Classroom training sessions can build off these models by providing pragmatic lessons instead of a general technical "how-to."

Specialized Projects

Another approach offers one-on-one support locally at large departments or schools. Locally assigned instructional designers could work with individual faculty to develop tools to address the specific needs of that particular academic area and leverage them accordingly.

Outreach, too, is important to encourage faculty development. ITSL makes frequent appearances at faculty functions to introduce them to its latest teaching-with-technology activities. Good word of mouth is important. Unless ITSL gains credibility among the faculty, it will have difficulty encouraging them to try new teaching tools.

Lessons Learned

Throughout their e-learning experiences, ITS staff and faculty members learned valuable lessons in several areas.

Relationship Building

ITS staff found they could reach more faculty members when they did the following:

- ◆ *Identify key faculty to champion e-learning.* “We can tell faculty members that technology in the classroom is great until we are blue in the face,” Baird said. “But when they see their colleague down the hall doing it and doing it well, and doing something meaningful that they could not do otherwise, that is a critical factor.”
- ◆ *Draw the user base into the process—preferably as early as possible.* “Faculty members teach us things all the time,” stated Miller. “We have our own viewpoints, and they pose questions that we never thought of.”
- ◆ *Market activities to build relationships.* ITSL constantly informs the faculty community about its activities by posting profiles of instructional technology applications on its Web site and publishing a semester newsletter. ITSL also showed a DVD on the faculty’s use of technology at a recent faculty meeting. Baird organizes “town hall” meetings with academic divisions or departments. “Often they are productive—particularly

the department-level ones—because you can get a group of people together who have similar needs,” he said. “If you build a solution for one, most likely it will be a solution for more than one. And you build an in-department support structure because faculty members will help each other and brainstorm together after the fact.”

Instructional Technology

Technology use in actual classroom contexts revealed three important issues:

- ◆ *Introduce technology only when there is a relevant application.* “I do think that when technology is introduced into a classroom environment, it should be natural to that course,” Burnett said. “The GIS software provided a natural link for my geographic information systems class. But to jam it into a course just to try some new technology is not a good idea.”
- ◆ *Explore the potential of faculty mentoring programs.* Dierk Hoffman would like to directly assist a colleague who is interested in using technology in the classroom, including pedagogical assistance. One caveat: The administration should support the mentor’s time investment.
- ◆ *Close faculty–instructional technology partnerships are important for developing strategies and troubleshooting problems.* “I think it is critical for me to have close regular contact with someone in IT who can help me,” explained Burnett. “For example, once the students modified maps out in the field, Ray [Nardelli] and I had to determine the most efficient way for them to get the maps into the desktop. To turn the faculty loose without occasional IT contact would not work.”

Successfully Managing E-Learning Programs

While Colgate does not measure the effectiveness of using technology in courses, creating a quantitative measurement method is a priority. Gregory and Baird acknowledge that they receive good feedback from faculty members on their experiences with technology in class, and Blackboard usage continues to climb, but Gregory would like some nonanecdotal data or research to discuss its effectiveness in concrete terms. "Colgate comes at technology from a pragmatic viewpoint," stated Gregory. "And if I am going to adopt an enterprise version of Blackboard, I want some hard data that shows how it has improved student performance." One solution under consideration is a subscription to the Teaching, Learning, and Technology (TLT) Group's Flashlight program² to help Colgate assess technology's impact in its classes.

The Future of E-Learning at Colgate University

In the short term, ITSL staff members notice that faculty members' support requests are evolving. "The next time we see a faculty member, he comes in with a request that represents the next notch up in terms of technical proficiency," stated Doherty. "Their questions are moving from 'How do I scan a picture?' to 'How do I use a series of images across my courses and use more visual aides in my instruction?' This is a totally different type of question." Requests for multimedia assistance are climbing also.

Over the longer term, Colgate has two initiatives under way. Gregory said the goal of the first one, Digital Campus, is "to put the personnel, hardware, and software in place to support anytime, anywhere access to information resources, tools, and ser-

vices." As part of this vision, the university plans several technical initiatives over the next three years, including

- ◆ the installation of a ubiquitous wireless network;
- ◆ support for new mobile multimedia computing devices, the creation of a campus portal, and an enterprise digital asset management and delivery system; and
- ◆ enhancements to its current network infrastructure.

The Digital Campus also provides the technical foundation for the second initiative, the university's \$40-million state-of-the-art Case Library and Center for Information Technology (CLiCIT). Colgate will expand and renovate its current library. Construction is scheduled to begin in summer 2003, with a scheduled opening date of January 2006. According to Gregory, "CLiCIT is the main focus of our evolutionary efforts in terms of e-learning support. All the PCs will handle multimedia at the desktop for amateur-level work. But the building will contain some very innovative spaces in a wireless environment for integrating technology into research, learning, and teaching: high-technology classrooms, sound-isolated audio and video production studios, digital multimedia work rooms for media conversion and digitizing—all to create professional-level multimedia presentations. It will be in the same building that houses Colgate's primary research collection. Everything will be centralized in one location, not only the creative tools, but the necessary technical infrastructure also."

CLiCIT culminates the collaboration between ITS and the library, as both will be located in the same building. "The center will support innovative interactions between the faculty, the students, the technology staff, and the librarians," Gregory explained. "The

building is really designed for our students to work with technology, but to be right there with the books to understand the traditional ways of communicating. We are transforming the library from a place to consume data to a place to access content, manipulate it, and create something unique.”

Another benefit is that the building will house all the ITS areas together. Currently Gregory and ITSL are located in the library; the rest of ITS is dispersed around the campus. The space will be designed for more open, collaborative interaction, with modular tables that can roll around—different groups can meet in different ways. The ITS space will have a dedicated project space to prototype new technologies and systems. ITSL will also have a larger facility to meet with faculty, conduct workshops, and

complete project work. Colgate will move its technical infrastructure—including the main server room—into the building.

“With the Digital Campus and the Case Library and Center for Information Technology, Colgate University continues to blend the intimacy of student–faculty interaction in the classroom with digital technologies that enhance the learning process,” summarized Gregory. The students’ liberal arts education combined with their exposure to cutting-edge technology positions them well for their postcollegiate life.

Endnotes

1. D. Baird, “Where Pedagogy Meets Technology,” *ITS @Colgate*, Vol. 5, No. 2, p. 1.
2. See <<http://www.tltgroup.org>>.