

Roadmap

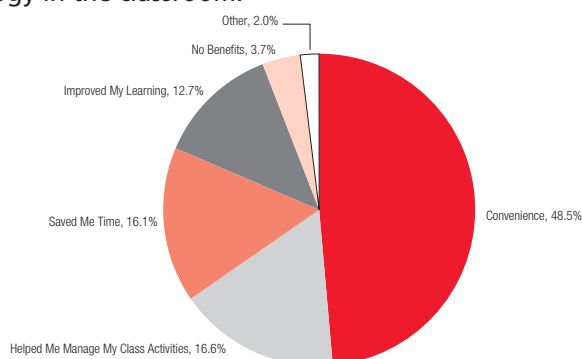
TOOLS FOR NAVIGATING COMPLEX DECISIONS

ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control

By Judith Borreson Caruso, Fellow, EDUCAUSE Center for Applied Research, and Director of Policy, Security, and Planning, University of Wisconsin–Madison

KEY FINDINGS

- ▀ Students use technology first for educational purposes, then for communication, management of classroom activities, and presentation of their work.
- ▀ Students' use of technology is strongly influenced by their academic major and class status.
- ▀ Students indicate that they know just enough technology functionality to accomplish their work. They do not have in-depth application knowledge or problem-solving skills.
- ▀ The primary benefit of information technology to students is convenience, followed by time savings.
- ▀ Most students prefer a moderate amount of technology in the classroom.
- ▀ The interactive features of course management systems—such as sharing materials among students and providing faculty feedback—are among the least used features but are perceived by students to have a significant impact on learning.
- ▀ The ability to track grades in a course management system greatly contributes to a student's ability to manage class activities.
- ▀ The more students use a course management system, the more they prefer its use.



A walk around most campuses reveals students chatting on their cell phones, e-mailing their friends and classmates, and surfing the Net for fun or studies. Indeed, technology thrives throughout most institutions. More classrooms are now enhanced with wired Internet connectivity (81.5 percent), computers (31 percent), and wireless Internet connectivity (17.7 percent).¹ Student ownership of computing and communication devices is also increasingly common. The EDUCAUSE Center for Applied Research *ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control* finds that 82.0 percent of freshmen and seniors at 13 participating higher education institutions own cellular phones; 62.8 percent own personal desktop computers, 46.8 percent own laptops, and 11.9 percent own PDAs.

Technology's increased presence in higher education suggests a new dimension to students' learning experiences but also presents new issues to contemplate: Will students demand greater use of technology in teaching and learning? Is it increasingly necessary for faculty to use technology to appeal to students? And, even more fundamentally, do students possess adequate skills to take full advantage of technology's benefits? The research study offers guidance with its in-depth examination of students' technology experiences in higher education, reporting on student use and skill.

This ECAR Roadmap synthesizes the results of 4,374 student responses from a February 2004 survey and interviews with students and administrators at 13 higher education institutions, as reported in ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control by Robert B. Kvakik, Judith B. Caruso, and Glenda Morgan. While this study presents statistically significant results for participating institutions, it is also likely that these results are indicative of student behavior at many similar institutions. To order the full study and learn about subscribing to ECAR, visit the ECAR Web site at <http://www.educause.edu/ecar/> or contact us at ecar@educause.edu.

KEY REPORT CONCEPTS

- ▶ **Course management system:** Software specifically developed to support courses and classroom activities. Current functionality of these applications often includes syllabus, grade reporting, electronic documents, discussion groups, sample exams, the ability to turn in assignments and get feedback online, and online quizzes.
- ▶ **Information technology in the classroom:** This includes PowerPoint presentations, e-mail, course management systems, and any other technology that the instructor might use.
- ▶ **Integrated learning management systems:** An integrated system that includes information and functions from enterprise administrative applications systems with the information and functions of course management systems and e-portfolios.

ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control reveals that the notion of widespread technical proficiency among students is somewhat misleading. For example, current undergraduate students do have greater access to and use of information technology than previous generations of students. Skill levels among students, however, vary widely, and students are likely to learn only as much technology as is needed for the task at hand rather than for in-depth technology use. Students also cite convenience as the major benefit of using information technology—to help them manage their college experience both inside and outside the classroom. To the extent that technology is used consistently across the institution in the classroom, it is valued as a good mechanism for students to manage their classroom activities. Students are frustrated when technology is used inappropriately, such as for duplicating faculty lectures. Students make heavy use of technology communication tools, such as e-mail and instant messaging, and value communicating with faculty members. Other findings follow.

Technology Ownership and Access

Fully 93.4 percent of the students surveyed for this research reported owning a computer. Ownership of a personal desktop was reported by 70.7 percent of the senior respondents and 57.1 percent of the freshmen respondents. Laptop computers are owned by 38.5 percent of the senior respondents and 52.7 percent of the freshmen respondents. Freshmen reported accessing the Internet most often using university resources (82.2 percent). Seniors most often used commercial access (56.4 percent). More than 81 percent of students had access to broadband service.

Students' Technology Use

Students reported that they use technology first for educational purposes, followed by communication and lastly for presentation. Students reported using a computer for writing documents (99.5 percent) and e-mail (99.5 percent),

followed by surfing the Internet for pleasure (97.2 percent) and for classroom activities (96.4 percent). Students also reported time spent using computers each week and for what purposes. Classroom activities topped the list of reasons for computer use, with an average of 3–5 hours per week per student. Using a computer for writing documents, surfing the Internet for pleasure, and processing e-mail were the next most frequently reported uses of technology. Students used more specialized applications the least, such as those for creating graphics, Web pages, and video/audio production. Academic use of technology is strongly related to academic major, with business and engineering students reporting the greatest technology use.

Students' Technology Skills

Skills with technology vary significantly, depending on the application. Students rated themselves highly skilled in the use of communications (e-mail and instant messenger), word processing, and the Internet. Skills with graphic tools and creating Web pages were reported at the unskilled level. Seniors tended to rank themselves higher than freshmen with tools such as PowerPoint and spreadsheets. Again, student major was a significant factor, with the highest skills reported by business, engineering, and life sciences students. While the students generally reported themselves fairly skilled at computer applications, in the qualitative interviews students noted that they learn just enough functionality to accomplish their work and do not have in-depth application knowledge.

Information Technology in the Classroom

Because today's undergraduate students have broad access to computers and fairly high skill levels with technology, it was expected that these students would prefer technology in the classroom. When asked about preference for technology in the classroom, students reported that they only wanted a moderate amount of technology (41.2 percent). Approximately 23 percent preferred classes that used limited

METHODOLOGY

- ▶ A literature review to identify and clarify the study's major elements and create a working set of hypotheses to be tested. Also, a review of other higher education IT student surveys.
- ▶ A review of and comparison with the 2003 ECAR study, *Faculty Use of Course Management Systems*, undertaken at the University of Wisconsin System by Glenda Morgan.
- ▶ A quantitative survey with a sample of 9,340 freshmen and 9,050 senior students, with 4,374 respondents 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; University of Wisconsin–Whitewater.
- ▶ Interviews of 132 students in focus group settings at 6 institutions and 23 administrators who support student information technology services.

technology, and 30.8 percent preferred classes that used technology extensively. Students who had previous positive experiences with technology in the classroom tended to have a stronger preference for it in other classes. Student major was an important predictor of preference for technology in the classroom, with engineering students having the highest preference for technology in the classroom (67.7 percent), followed by business students (64.3 percent).

The assessment of the impact of technology in the classroom is an important indicator to higher education institutions in determining whether technology initiatives in teaching and learning are improving the educational experience. Students reported that “helped me better communicate with the instructor” was the technology activity that had the greatest positive impact on their classroom experience. The second greatest impact was “getting prompt feedback from the instructor.” Technology was also reported as assisting in communicating and collaborating with classmates and helping manage classroom activities.

The greatest benefit of using technology in the classroom was for convenience (48.5 percent). Only 12.7 percent of the students reported that the most valuable benefit of technology in the classroom was improved learning. Also, in the survey's open-ended comments, 134 students voluntarily identified convenience as one of the primary benefits of using information technology in the classroom.

More than 54 percent of the students reported barriers to the use of information technology in the classroom. Of the barriers listed in the survey, the most problematic was “feels like extra work” (16.7 percent), followed by “applications not running on their computer” (14.1 percent), “lack of access to printers” (13.4 percent), and “lack of technical support” (9.7 percent).

Course Management Systems

Eighty-three percent of the students surveyed had taken a class that used a course management system. Seniors (90.1 percent) were more likely to have taken a class that used a course management system than freshmen (78.5 percent). The experience of the students who have taken a class that used a course management system was largely positive, with 76.1 percent reporting a positive or very positive experience, 17.3 percent neutral, and 6.6 percent negative or very negative. Ironically, students with a stronger preference for technology in the classroom had a lower preference for the use of a course management system. With one exception, the higher the percentage of students who had used a course management system at each institution, the higher the positive assessment of the course management system at that institution.

Course management system features most used by students were syllabus (95 percent), online reading (94.8 percent), track grades (98.4 percent), sample exams online (88.8 percent), and turn in assignments (78.5 percent). When students were asked about the benefits of using a course management system, the interactive features used least by the faculty were the features the students said contributed the most to their learning. These features, including “sharing materials with students,” “tracking grades,” and obtaining “faculty feedback on assignments,” were ranked highest for improving learning. Students reported that the administrative and convenience features in a course management system helped them manage their class activities.

RECOMMENDATIONS

Based upon its findings in *ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control*, ECAR offers the following recommendations to facilitate more effective use of technology resources for students:

1. Mine and analyze student course activity data to create programs and effective practices.

Through collection and analysis of data available from enterprise administrative systems, data warehouses, and course management systems, higher education institutions can develop new models of learning and effective practices. Also, as the use of technology in the classroom matures and comes to play an increasingly important role in support of quality education, it is likely that the higher education accreditation bodies will take greater interest in technology and establish technology criteria as a factor for accreditation.

2. Increase student and faculty information literacy.

Institutional leadership needs to 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 need to be considered in merit, promotion, and tenure decisions. No matter how well an institution implements faculty development in the use of technology, students still need to be provided with support and training in the use of technology. A program that identifies student skill and provides needed training, either for credit or not for credit, should be established.

3. Use the improved functionality in course delivery systems, and integrate with enterprise systems and e-portfolios.

The next generation of course management systems promises greater functionality and ease of use. Students will increasingly want to control and manage their entire college experience in a convenient and easy manner. Tools that integrate administrative and classroom transactions and activities, facilitate course and curriculum planning, and permit self-assessment of performance will provide institutions the ability to dramatically improve the student experience.

4. Take advantage of the proliferation of scholarly information available across the Internet.

As networked scholarly information becomes increasingly available, institutions should use this information to enhance their curricula. The standardization of learning objects will enable institutions to take advantage of these objects and reduce costs while improving the curriculum.

5. Explore and integrate new capabilities and practices as they emerge from video-gaming, virtual-reality, simulation, and modeling arenas.

Video gaming, virtual reality, simulation, and modeling are robust and profitable industries that are continually adding new capabilities and practices that could lead to improved information exchange and interaction between students and faculty. Institutions should continue to experiment in these areas.

6. Create comprehensive and integrated plans for the implementation of technology in support of learning.

The implementation of course management systems and other technologies in the classroom would benefit from an institution-wide planning process resulting in an approved instructional information technology plan. This plan should be a part of the broader institutional planning process and a part of a comprehensive information technology plan for the institution. This instructional technology plan needs to be curriculum-based.

Endnote

1. *EDUCAUSE Core Data Service, 2002 Summary Report*, available at <<http://www.educause.edu/ir/library/pdf/pub6005e.pdf>>.