

Roadmap

TOOLS FOR NAVIGATING COMPLEX DECISIONS

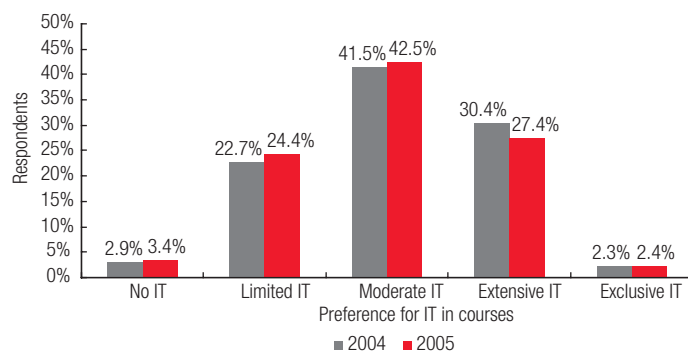
ECAR Study of Students and Information Technology, 2005: Convenience, Connection, Control, and Learning

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KEY FINDINGS

- ▶ Students use technology primarily for convenience and connection, both for academic and social activities.
- ▶ Laptop ownership in the 2005 study is 55.6 percent, well above the 46.8 percent laptop ownership in the 2004 study.
- ▶ Engineering, business, and life sciences students prefer more technology in courses than do students in other disciplines.
- ▶ More than 36 percent of student survey respondents think they do not need additional training in order to use IT in their courses. Older students say they need additional training more often than younger students.
- ▶ Most students prefer a moderate amount of technology in their courses.
- ▶ Students who perceive their instructors to be effective users of IT in the course report more engagement in the course, more interest in the subject matter, and better understanding of complex concepts.
- ▶ Of students who have used a course management system (CMS), more than 75 percent report a positive or very positive experience with it.
- ▶ Regarding CMS features, students most value tracking grades on assignments and tests, and accessing sample exams and quizzes.
- ▶ Students report that using a CMS improves their learning.

Change in Preference for IT in Courses



Higher education is investing substantial resources in IT to support teaching and learning. What is the return on the investment in equipment, applications, and training for faculty and students? How much technology do students want? These are just two of the questions addressed in the *ECAR Study of Students and Information Technology, 2005: Convenience, Connection, Control, and Learning*. This study in large part extends and enhances the *ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control*.

Technology Ownership and Access

More than 90 percent of freshman and senior respondents at the 63 participating higher education institutions own a

This ECAR Roadmap synthesizes the results of 18,039 freshman and senior student responses from a spring 2005 survey with students at 63 higher education institutions. Survey data were validated and enriched by student and administrator interviews at a number of participating institutions. The study results represent the experience of the sampled students. In the absence of our weighting of institutional responses, however, we can generalize only to the sampled students but not to the 63 institutions. These findings are instructive—though not necessarily conclusive—of student experiences at other 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.

COMPARATIVE HIGHLIGHTS OF 2004 AND 2005 RESULTS

For the 11 institutions that participated in both years of the study, we found...

- Increased ownership of laptop computers (46.3 percent in 2004 to 49.7 percent in 2005, up 7.3 percent)
- Increased ownership of cell phones (81.6 percent in 2004 to 88.7 percent in 2005, up 8.7 percent)
- Increased use of media-intensive technologies: creating and editing video/audio (13.6 percent change from 2004 to 2005), PowerPoint (11.7 percent change from 2004 to 2005), and creating Web pages (8.0 percent change from 2004 to 2005)
- Continued preference for a moderate level of technology in courses (41.5 percent in 2004; 42.5 percent in 2005)
- Continued positive impressions among students about course management systems (a mean of 3.86 in 2004 and 3.82 in 2005, where 1 = very negative and 5 = very positive)

cellular phone (up from 82.0 percent in 2004); 61.6 percent own a personal desktop computer (down from 62.8 percent in 2004), 55.6 percent own a laptop (up from 46.8 percent in 2004), and 12.6 percent own a PDA (up from 11.9 percent in 2004). Electronic music devices such as iPods are owned by 38.4 percent of the students, with males (46.3 percent, versus 34.2 percent for females) and freshmen (43.5 percent, versus 34.3 percent for seniors) having the highest rates of ownership.

These high rates of ownership are accompanied by high rates of broadband access to the Internet. More than 75 percent of the students report that they connect to the Internet primarily using wired broadband. Of those who do not connect with a wired broadband connection, a great many have fast connections via wireless.

Students' Technology Use

Students report using electronic devices to exchange e-mail (99.7 percent), write documents (98.9 percent), use the Internet for coursework (98.4 percent), and study and conduct other class activities (96.2 percent). College and university students spend considerable time with information technologies. Academic uses of IT are dominant, and the type of use is strongly related to the student's declared or intended academic major, with business and engineering students reporting the greatest technology use. Freshmen in general, and males in particular, spend greater amounts of time using entertainment and community technologies such as video games and instant messaging.

Students report that their greatest concerns in the use of technology are computer viruses, worms, and Trojan horses, followed by spam and slow network access.

Students' Technology Skills

When students report on their own technology skills, they tend to overstate their skills overall but do differentiate their skills among various technology applications. They report the greatest skills with word processing and computer operating systems. They report the weakest skills in creating Web pages and creating and editing video/audio. Nearly half of the students (49.3 percent) consider themselves at about the same skill level as other students. Responding students aged 20 to 24 are the most confident in their skills relative to those of their peers, followed by the group aged 30 to 39. Respondents age 50 and over report the lowest skill level. When asked about needing additional training in order to use IT in their courses, 36.7 percent state that they don't need additional training, 36.7 percent are neutral, and 26.7 percent say they need additional training. Older students are more likely to say they need training than younger students.

Information Technology in Courses

In ECAR's 2004 study, 41.2 percent of students noted that they preferred a moderate amount of technology in the classroom. This year, again, students also prefer taking courses that use a moderate amount of technology (40.6 percent). Surprisingly, the youngest students in the study (18- to 19-year-olds) have the least preference for the use of IT in courses (mean of 2.86, where 1 represents courses with no IT and 5 represents courses that use IT exclusively). The 30–39 age group has the strongest preference for the use of IT in courses (mean of 3.25). Seniors have a greater preference for IT in their

METHODOLOGY

- ▶ A review of the literature was undertaken, and other surveys, both in the United States and internationally, were examined.
- ▶ Results of *The ECAR Study of Students and Information Technology, 2004: Convenience, Connection and Control* and the 2003 ECAR study *Faculty Use of Course Management Systems* informed this study.
- ▶ A Web-based survey of undergraduate freshmen and seniors at 63 higher education institutions was conducted; 18,039 students responded. Respondents represented 30 DR, 18 MA, 12 BA, and 2 AA institutions.
- ▶ Qualitative interviews were conducted with 82 undergraduate students at 7 institutions.
- ▶ Interviews were conducted with 20 institutional instructional technology support staff.
- ▶ More than 8,000 open-ended student comments were analyzed.

courses than do freshmen. Also, a student's previous positive experience in a course that used IT has a positive impact on the preference for technology. Students at doctoral institutions (mean of 3.07) prefer greater use of technology in courses than students at baccalaureate institutions (2.77). A student's major is an important predictor of preferences for technology in courses. Engineering, business, and life sciences students have the highest preference for technology in their courses, and seniors in these majors have a higher preference for technology than their freshman counterparts.

When asked to evaluate the impact of the use of technology in their courses, students report highest scores for improved communications—communications with instructors, feedback from instructors on coursework, and communication with classmates. Next they report the positive impact of IT in their courses on the ability to improve the presentation of their work and to take greater personal control of course activities such as planning and apportionment of time. Students identified the most valuable benefit of using technology in courses as convenience (50.3 percent), followed by connection (19.7 percent), management of course activities (13.5 percent), and learning (12.7 percent). Only 2.8 percent perceive no valuable benefit of using technology in courses.

Overall, students give faculty good grades when asked whether their instructors use IT well in their courses, and the instructor's skill in using IT in courses makes a significant difference in the students' perceptions of the value of technology in courses. Instructor skill

has the biggest impact on improving communications with the instructor and instructor feedback, and it also increases student engagement in the course, interest in the subject matter, and comprehension of abstract concepts. For those students who indicate that IT in courses improves learning, the most significant factor is the skill of instructor, regardless of the students' age, gender, or major.

Course management systems

Fully 72 percent of students report having used a CMS. Of these, more than 75 percent report a positive or very positive experience with a CMS. The more students use these systems, the more they like them. Students who agree or strongly agree that courses using IT allow them to take greater control of their course activities (planning, apportioning time, noting success and failure) have the most positive experience with a CMS. Also, the instructors' perceived IT skills are a major contributor to students' having positive experiences with a CMS.

CMS features most valued by students are:

- ▶ Tracking of grades on assignments and tests, and accessing sample exams and quizzes.
- ▶ Course administration—accessing course syllabi, turning in assignments online, getting assignments back from instructors, accessing online readings, and taking exams online.

Some of the communication features of course management systems are less valued (but still valuable). These include sharing materials among students and online discussion boards.

RECOMMENDATIONS

1. The curriculum is important.

A major finding of the 2004 and 2005 ECAR studies is that students with the highest level of IT skills acquired many of these skills as a result of curricular requirements. In the absence of curricular requirements, students are likely to graduate with only the basic IT skills needed for employment. Curricula are becoming increasingly IT-intensive, as professional societies and government redefine the competencies required of some professions. Such mandates will likely lead to a requirement to develop explicit policies on the role of IT in courses and in the curriculum.

2. Definition of skills is needed for e-learning.

Once there is a shared understanding of which technologies should be used in courses and in the curriculum, at what level of sophistication, and for what purposes, it becomes possible to establish required skill sets. Each discipline must articulate the competencies required in areas such as informatics, simulation, and visualization. What level of digital literacy is required to find, retrieve, assess, and manage digital information? How skilled with IT and mobile devices must students be, especially as they enter the workforce?

3. Comprehensive training is suggested.

Once the level of required skills is agreed on, training programs can be designed for faculty and students. Students expect faculty to be skilled in the use of PowerPoint and course management systems. Students also report that they are looking for more innovative uses of information technologies that provide real-time data in experiential learning exercises; more visual materials; and simulation.

Institutions should require all of their colleges to articulate concrete IT competencies for students in their programs. Once aggregated, a work plan can be developed to achieve the proposed competency levels—through courses, changes in the curriculum, help centers, and so forth.

It would be useful to articulate desired faculty competency as well, although this may be more difficult to do and harder to implement. Articulating student competencies will probably guide the determination of required faculty competencies because the former will likely have to complement the latter in the work plan.

4. Consistent use of IT is desired, especially with course management systems.

Students are looking for more consistency in the specific technologies used and in how they are used. This is especially an issue with course management systems, which students believe to be inconsistently used by faculty. Students clearly want most of their courses to use course management systems and for faculty to use them in a consistent manner with a common appearance.

5. IT services and support need to be fast, easy-to-use, and reliable.

In their responses to the survey and in the interviews, students directly state that they need IT services that are fast, easy-to-use, and reliable. Without basic reliability, students feel they can't count on the technologies when they need them the most—submitting papers to their instructors, taking online exams, and communicating with instructors and classmates. Without a core set of dependable IT systems and services, students and instructors will not fully adopt technologies to enhance the learning environment.

6. Monitoring and benchmarking are needed.

While not a conclusion drawn directly from survey data, we believe that we need to measure student and faculty competencies, attitudes toward the use of IT in courses, and how students and faculty actually use IT. Such measures are needed to assess the effectiveness of the curriculum, the use of technologies, and the performance of the training programs.