

# Roadmap

TOOLS FOR NAVIGATING COMPLEX DECISIONS

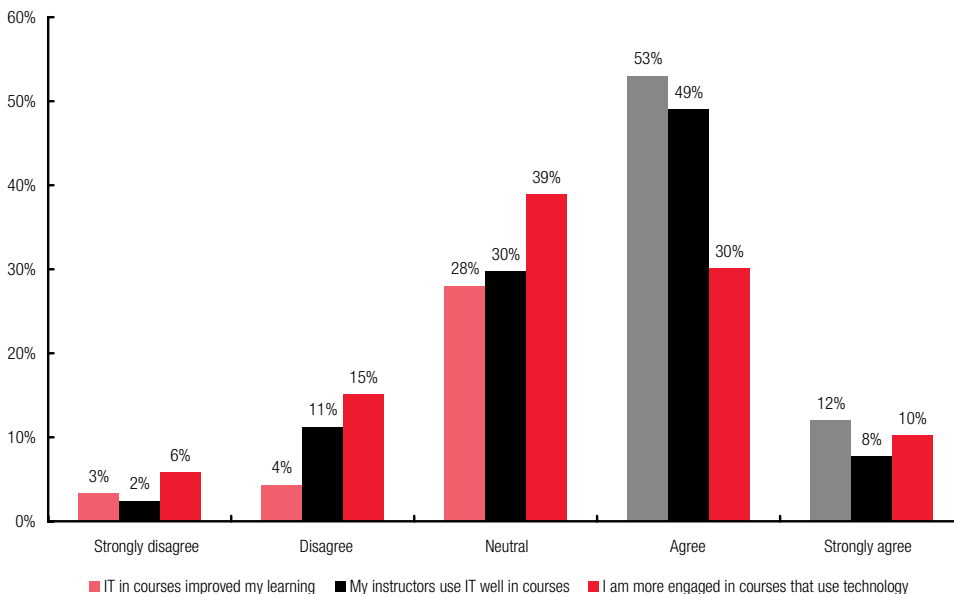
## The ECAR Study of Undergraduate Students and Information Technology, 2006

By Judith Borreson Caruso, ECAR and University of Wisconsin–Madison

### KEY FINDINGS

- Nearly 98 percent of undergraduate respondents own a personal computer. Nearly two-thirds (66.4 percent) own laptops.
- More than three-quarters of freshmen from four-year institutions own laptops.
- Student use of technology is strongly influenced by academic major and class status.
- Students say convenience is the primary benefit of IT in courses.
- Most students prefer a moderate amount of IT in their courses.
- Fully 64.4 percent of respondents agree or strongly agree that IT has improved their learning.
- Almost three-quarters of respondents have used a course management system. Most report a positive experience.
- The more students use a course management system, the more they prefer its use.
- Two-fifths (40.3 percent) of students indicate that they are more engaged in courses that use technology.

Student Evaluation of IT in Courses



Today's undergraduate students are often portrayed as technology-savvy, with information technology (IT) skills and usage well beyond those of previous student populations. The ECAR study was designed to validate, deepen, modify, or refute the many characterizations of these students. Through the use of both quantitative and qualitative data, the study focuses on student use and skill with IT and the students' experience with IT in their courses. This study summarizes the results of the student technology experience at 96 higher education

*This ECAR Roadmap synthesizes the results of 28,724 freshman, senior, and community college student responses from a spring 2006 survey and interviews with students at 96 higher education institutions as reported in The ECAR Study of Undergraduate Students and Information Technology, 2006 by Judith B. Caruso, Richard N. Katz, and Gail Salaway, with Robert B. Kvaivik and Mark R. Nelson. 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](mailto:ecar@educause.edu).*

## COMPARATIVE HIGHLIGHTS OF 2005 AND 2006 RESULTS

For the 49 institutions that participated in both years of the study, we found...

- ▀ Increased ownership of laptop computers (55.1 percent in 2005 to 69.8 percent in 2006)
- ▀ Increased ownership of desktop computers (60.6 percent in 2005 to 67.3 percent in 2006)
- ▀ Increased ownership of smart phones (combination cell phone and PDA) (1.1 percent in 2005 to 7.5 percent in 2006)
- ▀ Increased ownership of electronic music/video device (38.6 percent in 2005 to 61.3 percent in 2006)
- ▀ The most valuable benefit of IT in courses was convenience in 2005 (50.7 percent) and in 2006 (52.6 percent). The next most valuable benefits were "helped me manage my course activities" (13.2 percent in 2005, 18.0 percent in 2006), "improved my learning" (12.4 percent in 2005, 13.8 percent in 2006), and "helped me communicate with my classmates and instructors" (20.0 percent in 2005, 11.7 percent in 2006).

institutions. While these results are statistically significant for the institutions involved, it is also likely that these results are indicative of student behavior at many similar institutions.

*The ECAR Study of Undergraduate Students and Information Technology, 2006* is the third study of the experience of undergraduate students' experiences with IT. It seeks to enhance the results of the 2004 and 2005 ECAR studies, as well as provide a snapshot of the 2006 student experiences. Questions the study explored included "How much IT do students want in their courses?"; "What are student skill levels?"; and "What information technologies do students own and use?" This ECAR study provides some meaningful insights into undergraduates' IT experiences.

### Technology Ownership and Access

*The ECAR Study of Undergraduate Students and Information Technology, 2006* finds that 97.8 percent of freshmen, senior, and community college respondents at the 96 participating higher education institutions own a computer. Of these, 71.2 percent own a desktop and 66.4 percent own a laptop. Older students tend to own more electronic equipment than younger students, with the exception of laptops, where 76.7 percent of the freshmen respondents own laptop computers compared with only 61.2 percent of senior respondents. Fully 22 percent of students report owning a personal digital assistant (PDA) or a smart phone (combination cell phone/PDA). Males tend to own more of the electronic devices listed by ECAR than females (61.6 percent of males report owning four or more devices, compared with 48.3 percent for females). Electronic music devices such as iPods are owned by 58.6 percent of the student respondents.

These high rates of ownership are also accompanied by high rates of Internet connectivity. More than 90 percent

of respondents report that they connect to the Internet primarily using wired or wireless broadband.

### Students' Technology Use

Students report using an electronic device, on average, in excess of 23 hours per week, primarily for e-mail (99.9 percent) and writing documents for coursework (98.8 percent), followed by accessing library materials (94.0 percent). A smaller number of students engage in online gaming (34.2 percent) and blogging (28.6 percent). Seniors and business and engineering students report the greatest use, with engineering majors reporting that on average they use an electronic device more than 30 hours per week.

In terms of preferred e-mail account, students are almost evenly split between those who prefer their university e-mail account (50.3 percent) and those who prefer another account (49.7 percent). When asked about how they would like to receive university communications, 84.9 percent of the student respondents identify e-mail as their first choice.

### Students' Technology Skills

When the student respondents self-report their technology skills, they differentiate their skill levels among various applications. Nearly two-thirds of respondents (65.8 percent) report having at least basic skills with course management systems. Business and engineering students report the greatest skills overall. Seniors report using advanced features significantly more frequently than do freshmen in the key areas of online library resources, presentation software, spreadsheet software, and course management systems. Student respondents indicate that the primary reason they learn spreadsheet and presentation software is because it is required for a course or major. Graphics software is learned primarily because of personal interest. Only 27.0 percent

## METHODOLOGY

- ▶ A literature review to identify and clarify the study's major elements. A review of the results of the ECAR 2004 and 2005 surveys and a review of the results of other higher education IT student surveys.
- ▶ A review and comparison with the 2004 and 2005 ECAR studies of students and IT.
- ▶ A quantitative survey with a sample of 277,137 freshmen, senior, and community college students at 96 higher education institutions; 28,724 students responded. Respondents were from institutions classified as 42.6 percent Doctoral, 36.8 percent Masters, 8.3 percent Bachelors, 11.8 percent Associate, and .5 percent Other. Respondents were 63.2 percent female, 85.9 percent attend school full-time, and 63.1 percent live off campus.
- ▶ Interviews of 71 students in focus group settings at five institutions.
- ▶ Analysis of the nearly 5,000 student comments in responses to the survey open-ended questions.

of the students indicate that they need more training on the IT that they are required to use in their courses. Older students indicate more need for additional training than younger students.

### Information Technology in Courses

In ECAR's 2004 and 2005 studies, student respondents noted that they preferred a moderate amount of technology in the classroom. This year, again, students overwhelmingly prefer taking courses that use a moderate amount of technology (56.2 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 2.92, where 1 = courses with no IT and 5 = courses that use IT exclusively). The 30–39 age group has the strongest preference for the use of IT in courses (mean of 3.30). Engineering students have a greater preference for IT in their courses than students in other majors. Students who identify themselves as innovators or early adopters of technology have a higher preference for IT in their courses than other students.

Almost all students this academic period (94.1 percent) use e-mail in their courses, followed by presentation software (63.3 percent), course management systems (64.6 percent), and course Web sites (64.6 percent). Very few students report use of blogs (7.0 percent), Webcasts (3.9 percent), and podcasts (3.3 percent) in their courses for this academic period. Engineering and business students report more information technologies used, while students in physical science disciplines use more discipline-specific software than students in other majors.

Students identify the most valuable benefit of using technology in courses as convenience (51.4 percent), followed by "helped me manage my course activities" (18.7 percent), "improved my learning" (14.5 percent), and "helped me communicate with my classmates and instructors" (10.9 percent). Only 3.3 percent of the student respondents perceive that there is no benefit from IT whatsoever.

Of the 72.7 percent of students who report use of a course management system, more than 75 percent report a positive or very positive experience with it. This is virtually identical to the 2005 study findings. Seniors report the greatest use of course management systems (81.8 percent), with freshmen (72.1 percent) and community college students (54.6 percent) reporting less usage. Nearly half of the responding students report using all nine of the course management system features listed by ECAR. The median number of features used is eight.

The course management system feature most valued by students is keeping track of grades on assignments and tests (4.25 mean, where 1 = not useful, 2 = somewhat useful, 3 = useful, 4 = very useful, and 5 = extremely useful). All features are identified as useful, with "sharing materials among students" (mean of 3.44) and "online discussion boards" (mean of 3.23) identified as the least useful. Those students reporting a positive experience with course management systems rate all the features more useful than those students who reported a negative experience with course management systems. Also, the more a student uses a course management system, the more he or she likes it.

When asked about IT's contribution to their academic experience, student respondents are positive about the seven academic outcomes queried. These outcome statements included "IT helps me to do better research for my courses," "The use of IT in my courses has improved my learning," and "IT helps me better communicate and collaborate with my colleagues." More than 64 percent agree or strongly agree that IT has improved learning. Older students, business majors, and engineering majors are more positive about the impact of IT on their academic experience than are other students. Students who describe themselves as early adopters or innovators with technology agree more positively with academic outcome statements than do students who describe themselves as later adopters of technology.

## OBSERVATIONS—WHAT DOES THIS MEAN?

Based on its findings in *The ECAR Study of Undergraduate Students and Information Technology, 2006*, ECAR thinks these observations merit further consideration:

### 1. Undergraduate students are a diverse group.

The perception that the typical undergraduate is 18–24 years old is changing, with more and more returning adults attending colleges and universities. While younger students are perceived overall as ready technology adopters and eager for more IT in their courses, their responses to the ECAR survey indicate that they desire a moderate amount of technology in the classroom. Younger students also identify themselves as less skilled than older students in specialized software such as spreadsheets and presentation software. Older students are more likely to say they need training than younger students. The majority of undergraduate students in this study identify themselves as mainstream technology adopters. Yet, 36 percent of the students identify themselves as innovators or early adopters and 15 percent as late adopters or laggards. Some question remains how higher education institutions are going to meet the varied IT demands of the diverse undergraduate student population.

### 2. The curriculum matters when it comes to student use and skill with technology.

A major finding of the 2006 ECAR study is that students with the highest level of IT skills acquired many of these skills because of curricular requirements. Students note that they learn technologies because it is required in their courses. Engineering and business students report the highest use and skill with presentation and spreadsheet software. Fine arts students report greater skill with graphics software than other students. This data indicates the importance of the curriculum in the development of needed IT skills for students.

### 3. Use of technology changes as undergraduate students mature.

Freshmen and senior students profile differently in their use and skills with IT. Freshmen tend to use instant messaging, blogs, and social networking software more than seniors. The question remains whether these freshmen will carry this into their senior year, or whether it is truly an age phenomenon. Seniors use presentation and spreadsheet software more frequently than their freshmen counterparts. This is likely due to the increased requirements for use of this software in their courses. To what extent can institutions introduce these specialized technologies earlier in students' academic careers?

### 4. IT in courses is about convenience.

In their responses to the survey, many students report that IT in their courses is about convenience. They are pleased that IT allows them to balance their work, academic, and personal lives. They find online course content convenient to access on their schedule rather than being at a set time and place. These students indicate the importance of being able to communicate with classmates and faculty via e-mail at any time and receive prompt answers to their questions. Students express dissatisfaction when course management and e-mail systems are down or unavailable, when response times are slow, or when the technology doesn't allow them to complete their coursework.

### 5. Overall, students prefer a moderate amount of technology in courses.

While many students may readily adopt social technologies, overall they clearly indicate a preference for a moderate amount of technology in their courses. Many students want technology to be a supplement to the classroom experience, not a replacement. While this is true of many students, there are also students who find completely online courses valuable, enabling them to access the course at their convenience.

Student respondents who identify use of podcasts, e-portfolios, instant messaging, Webcasts, and simulations in their current academic period are more likely than other students to say that IT in courses improves learning. Two-fifths (40.3 percent) of the student respondents agree or strongly agree that they are more engaged in

courses that incorporate IT, and more than two-thirds (68.7 percent) believe that IT facilitates prompt feedback from their instructors. More than half of ECAR respondents (55.3 percent) believe that IT helps them communicate and collaborate more effectively with their fellow students.