

Key Findings

The ECAR Study of Undergraduate Students and Information Technology, 2008

Judith Borreson Caruso and Gail Salaway

For today's traditional-age undergraduates, information technology (IT) plays an integral role in their everyday lives. They actively use technology for school, work, and recreation. As new technologies become available, they readily adopt them as soon as they perceive that the benefits and costs are aligned. Yet, the extent of student technology adoption and perception of the value of these technologies is not readily known. In its fifth study of undergraduate students and IT, the EDUCAUSE Center for Applied Research (ECAR) seeks to more fully understand the varied use of, skills with, and experiences with IT of today's undergraduate students.

The ECAR Study of Undergraduate Students and Information Technology, 2008 analyzes the responses of 27,317 freshmen, seniors, and community college students at 98 colleges and universities in the United States to a web-based survey, as well as findings from focus-group discussions. It also compares responses from students from institutions that have participated in the study over the past few years. The goals of the ECAR annual student surveys are to:

- provide information on the technology behaviors, preferences, and attitudes of higher education's undergraduates, especially as these variables relate to their academic experience,
- provide information to college and university administrators that will help them implement campus technology environments for students, and
- inform the practices of teaching faculty who are working to incorporate information technologies in rich and meaningful ways into their curricula and pedagogies.¹

Because of the increasing interest and use of social networking sites (SNSs) among undergraduates, the 2008 survey included questions about students' use of and experiences with these websites in addition to a set of core survey questions about undergraduate students' use of, skill with, and experiences with IT. Also, Nicole Ellison of Michigan State University opens the study by describing her research and perspectives about social networking's impact on students and the community.

Methodology and Study Participants

The 2008 study, which builds on previous ECAR studies of undergraduates and IT, consists of the following data collection and analytical initiatives:

- A literature review (extending the 2007 literature review) and review of other relevant surveys.
- A quantitative web-based survey of college and university freshmen and seniors at 90 four-year institutions (24,000 respondents, or 87.8% of the total) and students at 8 two-year institutions (3,317 respondents, or 12.2% of the total).
- Student focus groups, which provided qualitative data from 75 students at 4 institutions.
- Analysis of qualitative data from 5,877 written responses to the survey's open-ended question.
- Comparison of longitudinal data collected in the 2006, 2007, and 2008 surveys where available.²

Significant Findings

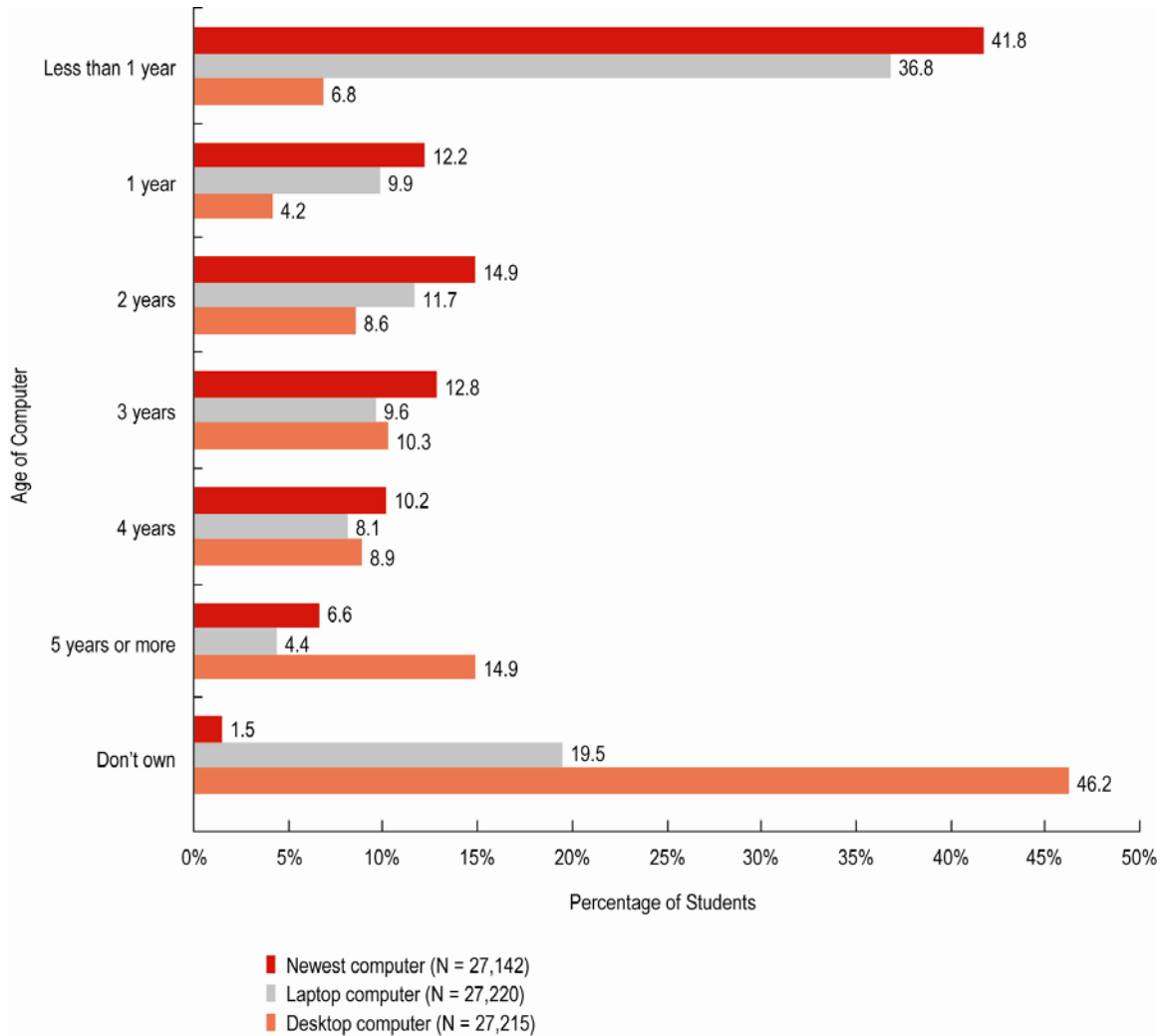
Following are some of the important findings of *The ECAR Study of Undergraduate Students and Information Technology, 2008*.

Ownership of Technology

More than 80% of student respondents own laptops, 53.8% own desktops, and one-third of them own both a laptop and a desktop. The longitudinal data for those institutions that have participated in ECAR studies for the past three years show that laptop ownership has increased from 65.9% in 2006 to 82.2% in 2008. In fact, freshmen respondents are entering college with new laptops in hand—this year 71.1% have a laptop less than one year old. And most respondents (68.9%) own a computer of some type that is two years old or less, well within recommended equipment replacement cycles (see Figure 1).

Ownership of Internet-capable cell phones is also on the rise, now owned by 66.1% of respondents. Most respondents, however, do not yet take advantage of the Internet capability, citing high cost, slow response, and difficulty of use as primary reasons. Despite these barriers to use, almost one-fourth of respondents do access the Internet from a cell phone or PDA at least monthly, and 17.5% do so weekly or more often. Among respondents who say they are early adopters of technology, 25.9% already access the Internet from handheld devices weekly or more often.

Figure 1. Age of Computers Owned by Students



Use of Technology

Student survey respondents report spending an average of 19.6 hours per week actively doing online activities for work, school, or recreation, and 7.4% spend more than 40 hours per week. Engineering majors use the Internet most often (mean of 24.8 hours per week), and life/biological sciences and education majors show the least use (means of 17.9 and 17.6 hours per week, respectively).

Almost all students surveyed use the college or university library website (93.4%) and presentation software (91.9%). Also used by most students are spreadsheets (85.9%), SNSs (85.2%), text messaging (83.6%), and course management systems (CMSs) (82.3%). Younger students report much greater use of social networking, text messaging, and instant messaging than older students (see Table 1).

Table 1. Student Computer and Internet Activities

	Students Engaged (N = 27,317)	Median Frequency of Use*	Associated Demographic Factors
Almost All Students Engaged			
Use the college/university library website	93.4%	Weekly	4-year institutions/ social sciences
Presentation software (PowerPoint, etc.)	91.9%	Monthly	4-year institutions/ seniors
Most Students Engaged			
Spreadsheets (Excel, etc.)	85.9%	Monthly	Seniors/business/ engineering
Social networking websites (Facebook, MySpace, Bebo, LinkedIn, etc.)	85.2%	Daily	Age (younger)/reside on campus
Text message	83.6%	Daily	Age (younger)
Course management system	82.3%	Several times/ week	4-year institutions
Download web-based music or videos	77.3%	Weekly	Male/age (younger)
Graphics software (Photoshop, Flash, etc.)	73.9%	Monthly	Fine arts
Instant message	73.8%	Several times/ week	Age (younger)/reside on campus
Some Students Engaged			
Contribute content to photo or video websites (Flickr, YouTube, etc.)	46.6%	Monthly	–
Contribute content to wikis (Wikipedia, course wiki, etc.)	38.2%	Monthly	–
Contribute content to blogs	34.1%	Monthly	–
Video-creation software (Director, iMovie, etc.)	32.9%	Once per quarter/ semester	Male
Audio-creation software (Audible, GarageBand, etc.)	32.5%	Once per quarter/ semester	Male
Use the Internet from a cell phone or PDA	30.8%	Weekly	–
Online multiuser computer games (<i>World of Warcraft</i> , <i>EverQuest</i> , poker, etc.)	29.4%	Monthly	Male
Podcasts	29.1%	Monthly	Male
Webcasts	25.0%	Monthly	Male
Social bookmark/tagging (del.icio.us, etc.)	16.7%	Monthly	–
Online virtual worlds (Second Life, etc.)	8.8%	Once per quarter/ semester	–

**The median frequency of use is calculated only for those students engaged in an activity. It is the midpoint in a series of data values; half the data values are above the median, and half are below. Data values are once a year, once per quarter/semester, monthly, weekly, several times/week, and daily.*

About one-third of respondents report using audio-creation or video-creation software (males more than females), and 73.9% use graphics software (Photoshop, Flash, etc.). Almost one-third engage in online multiuser computer games (*World of Warcraft*, *EverQuest*, poker, etc.) and already about 1 in 11 respondents (8.8%) report using online virtual worlds (*Second Life*, etc.). And students are interactive on the net, with more than one-third contributing content to blogs, wikis, and photo or video websites.

Student IT Skills and Information Literacy

ECAR survey respondents generally perceive that they are “fairly skilled” to “very skilled” in the core applications commonly used for coursework—presentation software (PowerPoint, etc.) (mean of 3.62 on a scale where 1 = not at all skilled, 2 = not very skilled, 3 = fairly skilled, 4 = very skilled, and 5 = expert); college or university library website (mean of 3.48); spreadsheets (Excel, etc.) (mean of 3.41); and CMSs (mean of 3.39). Seniors report greater skill than freshmen in using the college or university library website and spreadsheets (Excel, etc.), reflecting experience gained from taking more courses. Gender differences are not great, with males and females reporting similar skill levels for most applications. Males do, however, report much stronger skills for computer maintenance.

This year ECAR asked three questions about information literacy, derived from the standards published by the Association of College and Research Libraries (ACRL). Not surprisingly, respondents consider themselves quite Internet savvy. A full 79.5% give themselves glowing marks for their ability to “use the Internet effectively and efficiently to search for information,” with almost half rating themselves as “very skilled” and another third rating themselves as “experts.” Although overall ratings are lower, about half of respondents also say they are “very skilled” or “expert” when it comes to “evaluating the reliability and credibility of online sources of information” or “understanding the ethical and legal issues surrounding the access and use of digital information.”

Skills and technology adoption rates are related. Just over one-half of respondents consider themselves mainstream adopters of new technologies. About 36% consider themselves early adopters of technologies, and only 13% consider themselves late adopters of technology. Respondents who perceive themselves as early adopters of technology are also more likely to consider themselves “very skilled” or “expert” with presentation software (PowerPoint, etc.), spreadsheets (Excel, etc.), the college or university library website, and computer maintenance (software updates, security, etc.).

IT in Courses

Every year, the ECAR study has asked students how much technology they prefer in their courses. For the past three years’ studies, student respondents report preferring a moderate amount of IT in their courses, with 59.3% of the respondents doing so in 2008. When asked about this finding, students in the focus groups emphasized the value of face-to-face interaction with instructors. Some recent research validates what these students say. An examination of more than 400 studies about factors contributing to student retention and degree completion concludes that “face time” with faculty and peers contributes to students feeling included and integrated into the academic environment, and ultimately contributes to their academic success.³ This year, for the first time, students from all age groups show the same pattern of preference for IT in courses. Previous years’ studies found that younger respondents preferred less technology in their courses than older respondents.

Most students report use of presentation software (PowerPoint, etc.) (63.5%) and the college or university library website (67.7%) in their courses during the quarter or semester of the study (February 15–April 7, 2008). Spreadsheets (Excel, etc.) are also used by 43.3% of students. All other technologies asked about are used by 20% of respondents or less. Student major plays a role in technology use. Engineering and physical sciences majors use more programming languages and discipline-specific IT; business and engineering majors use more spreadsheets; and fine arts majors use more graphics, audio-creation and video-creation software. Community college students report generally less use for all these technologies. Also, while few respondents use podcasts (4.2%), student comments from focus groups and from the survey were extremely positive about podcasts as a supplemental tool for courses.

ECAR asked students if they liked to learn using specific technologies. Most respondents report a preference to learn by running Internet searches (80.2%), and more than one-third like to learn through text-based conversation over e-mail, IM, text messaging, or through contributing to websites, blogs, wikis, and the like. Interestingly, a solid half (50.8%) like to learn through programs they can control such as video games and simulations.

The 2005 and 2006 ECAR studies reported that about 72% of all respondents had taken a course using a CMS sometime in their college career. Then, in 2007, the data showed a significant jump to 82%. This year, student exposure to CMSs remains at this increased level (82.3% of respondents). Most of these respondents use CMSs several times per week or more often.

At four-year institutions, somewhat more seniors (85.3%) have used CMSs than freshmen (77.1%). Among respondents from the eight participating community colleges, only 60.1% of respondents have used a CMS. Respondents generally like using a CMS—57.8% say their CMS experience is positive, and an additional 11.7% go so far as to say their experience is very positive. Only 5.3% report an overall negative experience with CMSs.

Availability of IT Services for Coursework

In 2008, for the first time, the ECAR survey asked students if they agree with the following statement: “My institution’s IT services are always available when I need them for my coursework.” Just under 50% of the respondents agree or strongly agree, with 16.8% disagreeing or strongly disagreeing. At most institutions (81.6%), 40% to 59% of students agree that IT services are always available for coursework, indicating a need for institutions to improve the reliability of their services.

Skipping Classes When Materials are Online

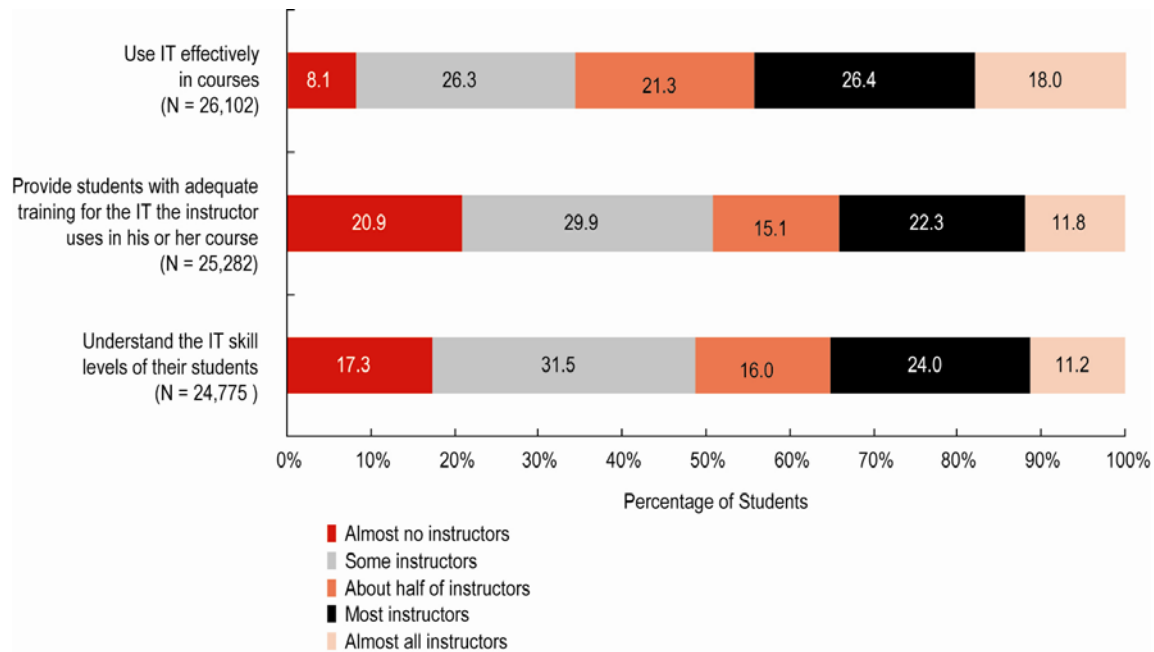
Also, for the first time in 2008, the ECAR survey asked students if they skip classes when materials from course lectures are available online. Just more than 62% of students disagree or strongly disagree. About 1 in 6 respondents, however, agree that they skip classes when these materials are online. When asked about skipping classes in the focus groups, students mention the importance of interaction with the instructor in learning the course materials.

Instructor Use of IT in Courses

Again this year, hundreds of student comments address the link between technology, instructors, and learning. Qualitative analysis shows that the themes are consistent with last year (see the 2007 study report for an in-depth report of the qualitative analysis).⁴ Taking the next step, the 2008 survey asked

students three specific questions about instructor use of IT (see Figure 2). ECAR finds that 44.4% of respondents report that “most” or “almost all” of their instructors use IT effectively in courses. Also, 34.1% of respondents report that most or almost all of their instructors provide students with adequate training for the IT the instructor uses. Approximately one-third of respondents report that most or almost all of their instructors understand the IT skill levels of their students.

Figure 2. Instructors and IT in Courses



Student Success and IT in Courses

How does higher education’s use of IT affect student success? While this is a bottom-line concern for both educators and administrators, it is fraught with exceedingly complicated issues. Still, the ECAR survey provides a valuable opportunity to learn more about this critical area—specifically about how students perceive the impact of IT on courses. To this end, ECAR designed one question about each of three important dimensions of student success:⁵

- *Learning*: “The use of IT in my courses improves my learning.” (45.7% of respondents agree)
- *Student engagement*: “I get more actively involved in courses that use IT.” (31.8% agree)
- *Convenience*: “IT makes doing my course activities more convenient.” (65.6% agree)

Convenience is the clear front-runner. Each year, in both the quantitative and qualitative data, respondents have told us that convenience is the most valuable benefit of IT in courses. Still, 9.4% of 2008 respondents disagree, indicating that there is room for improvement even on the convenience dimension. With respect to learning, almost half agree (45.7%), another 39.3% are neutral, and 15.1% disagree that IT in courses improves their learning.

This distribution of responses is consistent across most demographic factors, with a few exceptions. Engineering and business majors agree slightly more with the statements about the academic

outcomes of IT. However, the respondents who are most positive about the impact of IT are those who prefer more IT in their courses, who describe themselves as early adopters of IT, who are positive about their CMS experience, who think their instructors use IT effectively in courses, and who agree more strongly that their institution's IT services are always available for coursework when needed.

Social Networking Sites

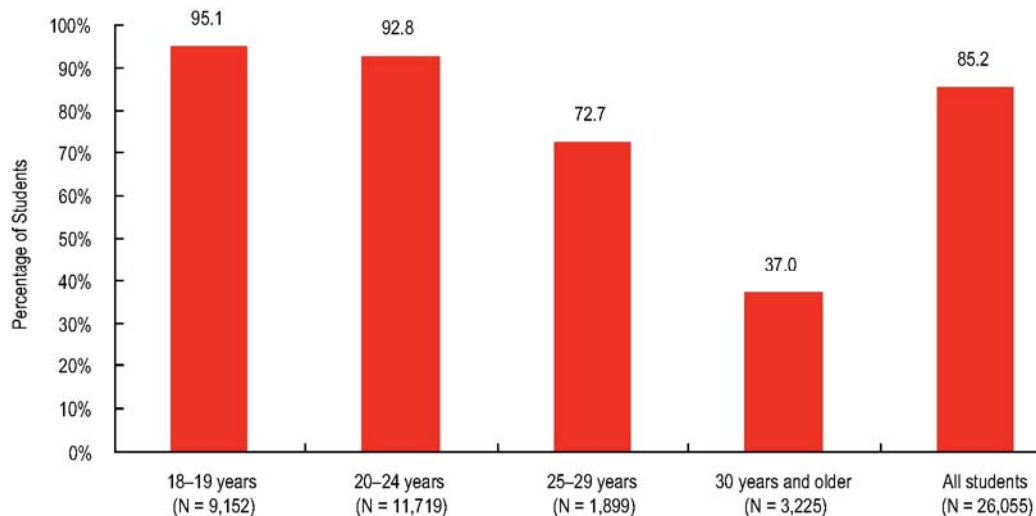
The growing significance of SNSs in student culture and high participation rates for them in the 2007 study led ECAR to include a focused set of questions about students' use of and experience with SNSs in the 2008 survey. Besides the quantitative survey questions, SNSs were discussed in the student focus groups as well.

SNSs, Profiles, and Friends

Over 85% of respondents report using SNSs. In fact, ECAR longitudinal data about basic SNS usage from the 2006 survey to the 2008 survey—an elapsed time of only two years—shows that for the 44 institutions that participated in all three years' surveys, there is an increase in respondents who use SNSs, from 74.8% to 88.8%. But the striking change was in how many respondents now use SNS on a daily basis, from 32.8% in 2006 to 58.8% in 2008. Bottom line, SNS usage has increased, and dramatically so.

Age is the single most important factor in looking at usage of and perceptions about SNSs. Younger students are clearly leading the charge. Virtually all respondents 18–19 years old use SNSs (95.1%) as do those aged 20–24 years (92.8%) (see Figure 3).

Figure 3. Use of Social Networking Sites, by Age



Most respondents report using just one (52.9%) or two (38.4%) SNSs, and by far, most keep only as many profiles as the number of SNSs they use. These SNS profiles appear to be stable—with 80.7% of respondents saying they change a profile only monthly or less often. SNS friends are an entirely different matter, with more than one-fourth of respondents (28.4%) saying they have more than 300 SNS friends. Younger respondents keep many more SNS friends than older respondents. Facebook

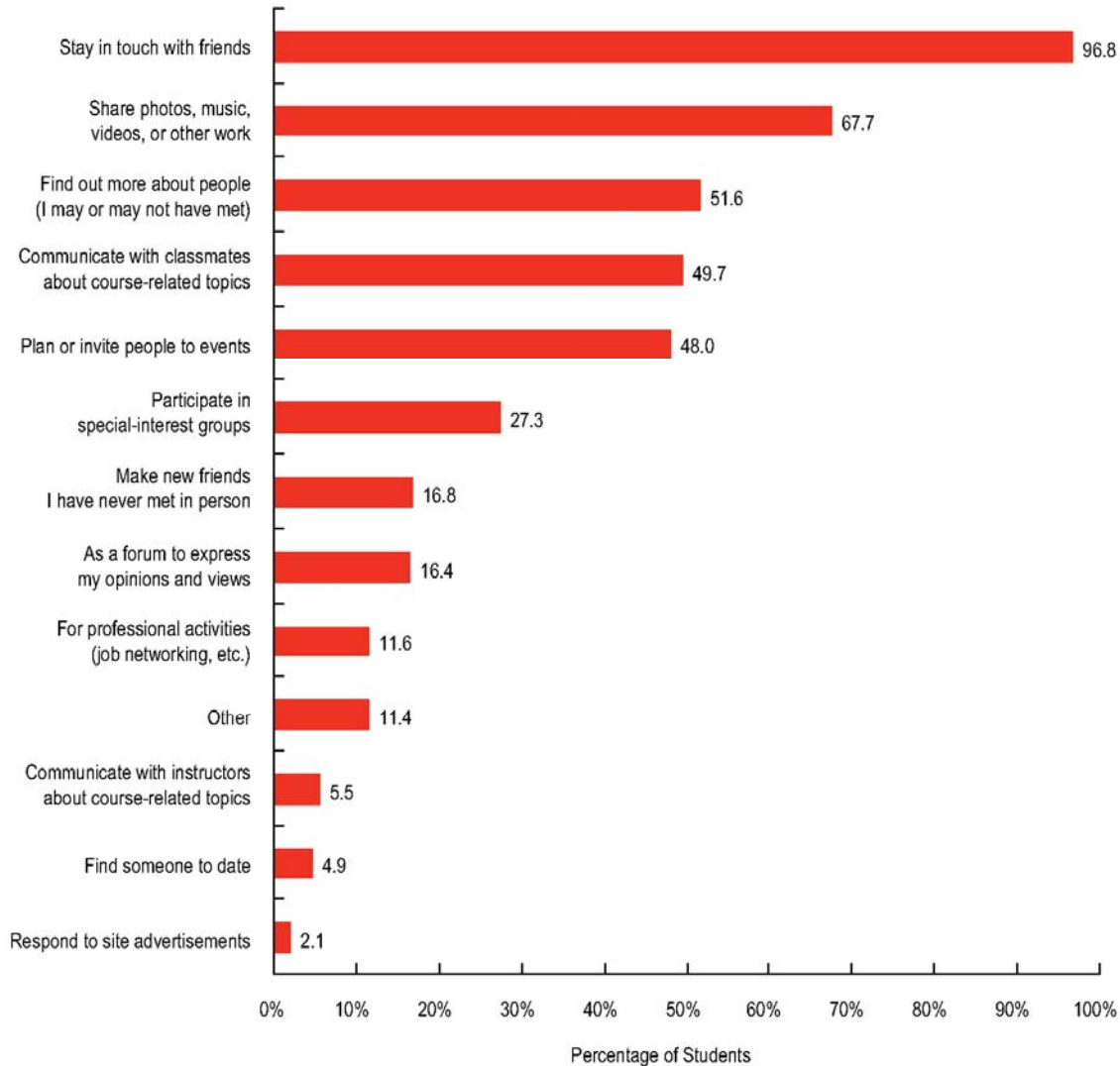
is clearly the SNS of choice, used by 89.3% of students, with MySpace second at 48.3%. Other specific SNSs each had less than 10% usage.

ECAR asked the 14.8% of respondents who do not use SNSs, why not? Two-thirds of these respondents say that one of their top three reasons for not using SNSs is that they are just not interested, and two-fifths say they actually don't like SNSs. This agrees with what students said in the focus groups. A familiar comment was, "I'm not interested. I tried it once, and it seemed like a waste of my time."

SNS Uses

Most respondents (55.8%) spend 5 hours or less per week on SNSs and another 26.9% spend between 6 and 10 hours per week. The most common use of SNSs is to stay in touch with friends (96.8%) (see Figure 4). Repeatedly, in the open-ended survey comments and in the focus groups, students spoke about the value of SNSs for getting and (creatively) staying in touch with family, local friends, long-distance friends, high school friends, and a host of other colleagues.

Figure 4. How Social Networking Sites Are Used (N = 22,207)



Perhaps most interesting to colleges and universities is the finding that half of respondents who use SNS (49.7%) have integrated them into their academic lives as a mechanism for communicating with classmates about course-related topics (females more than males). Only 5.5%, however, extend their use of SNSs to communication with instructors about course-related matters. Students in focus groups and in the survey comments expressed both pros and cons to involvement of instructors in their SNS lives—many adamant that SNSs should be the exclusive realm of students, but others liking the idea of interacting with instructors and teaching assistants using the same SNS mechanism they already use to communicate with friends and classmates.

SNS Privacy and Security

Early research on social networking tended to focus on SNS privacy and security issues, especially the risks of identify theft, harassment, or other misuse of personal data. In response to ECAR's question about what personal information students reveal online, first name and photos were the most common (revealed by about 90% of students). Younger respondents are more likely to reveal all types of personal information ECAR asked about, especially last name, date of birth, e-mail address or IM screen name, and cell phone number. Data patterns for revealing information are similar for males and females, except that females use more caution about revealing information that can be particularly useful in identifying them directly, such as last name, cell phone number, and address or home phone number.

Overall, students do not appear overly concerned about privacy and security issues in their use of SNSs. Only about half of respondents (54.4%) are at least moderately concerned that there will be misuse of their personal information. Females were more concerned than males about security issues and about cyberbullying or cyberstalking. Older students are more concerned than are younger students about security problems and misuse of their personal information. In the focus groups, students expressed confidence in their ability to control who could see their profiles, and they acknowledged placing restrictions on access to their profiles. In fact, about 87% of survey respondents indicated that they do put restrictions on their profiles.

The strongest finding is that respondents who are more concerned about privacy and security are much more likely to place restrictions on their SNS profiles. These SNS users are also somewhat more likely to reveal less personal information on SNSs.

Conclusion

Most of the 2008 survey respondents belong to the Net Generation, and the ECAR data confirm the IT use characteristics often assigned to this generation. Findings indicate that they value IT's role in providing convenience and expect IT services to be available when they need them; they actively use multiple modes of IT to communicate, socialize, and stay connected with others; they perceive themselves as net savvy; they choose mobile technologies and use of visual media; and they take advantage of Web 2.0 technologies to express themselves on the Internet in varied and creative ways. Older students show many of these characteristics as well.

At the same time, Net Generation students, along with older students, report that they are not looking for extensive use of IT when it comes to their academic courses. They do not take lots of entirely online courses, and most indicate that even when course lecture materials are posted online, they still

attend classes. Instead there is a widespread attitude that IT resources are best situated in learning environments where technology is balanced with other learning activities, especially face-to-face interactions with faculty and students in the classroom. As one engineering major summed up, “I feel that IT is a wonderful tool when it is fully understood by both the course instructor and the students. Anything less than that and the tool suddenly becomes something that merely looks pretty, or in the worst case, is a clunky monster.”

Endnotes

1. In the initial 2004 study, 13 colleges and universities participated; in 2005, 63 institutions; in 2006, 96 institutions, and in 2007, 103 institutions. (See Robert B. Kvavik, Judith B. Caruso, and Glenda Morgan, *ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control* (Research Study, Vol. 5) (Boulder, CO: EDUCAUSE Center for Applied Research, 2004); Robert B. Kvavik and Judith B. Caruso, *ECAR Study of Students and Information Technology, 2005: Convenience, Connection, Control, and Learning* (Research Study, Vol. 6) (Boulder, CO: EDUCAUSE Center for Applied Research, 2005); Gail Salaway, Richard N. Katz, and Judith Borreson Caruso, with Robert B. Kvavik and Mark R. Nelson, *The ECAR Study of Undergraduate Students and Information Technology, 2006* (Research Study, Vol. 7) (Boulder, CO: EDUCAUSE Center for Applied Research, 2006); and Gail Salaway and Judith Borreson Caruso, with Mark R. Nelson, *The ECAR Study of Undergraduate Students and Information Technology, 2007* (Research Study, Vol. 6) (Boulder, CO: EDUCAUSE Center for Applied Research, 2007), all available from <http://www.educause.edu/ecar>.
2. For comparison of 2006, 2007, and 2008 data, the data from the 44 institutions that participated in the student study each of these years is used. While these institutions are the same over these time periods, they have surveyed different students each year.
3. Veronica A. Lotkowski, Steven B. Robbins, and Richard J. Noeth, *The Role of Academic and Non-Academic Factors on Improving College Retention* (ACT, 2004), http://www.act.org/research/policymakers/pdf/college_retention.pdf.
4. Salaway and Caruso, *The ECAR Study of Undergraduate Students and Information Technology, 2007*, 85–88.
5. Peter Ewell and Jane Wellman, “Enhancing Student Success in Education: Summary Report of the NPEC Initiative and National Symposium on Postsecondary Student Success” (National Postsecondary Education Cooperative [NPEC], 2007). ECAR used this and other articles generated from the initiative.

Judith Borreson Caruso (judy.caruso@cio.wisc.edu) is an ECAR Fellow and Director of Policy and Planning at the University of Wisconsin–Madison. Gail Salaway (gsalaway@educause.edu) is an ECAR Fellow.

A copy of the full study referenced above will be available via subscription or purchase through the EDUCAUSE Center for Applied Research (www.educause.edu/ecar).
