The ECAR Study of Undergraduate Students and Information Technology, 2008

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The ECAR Study of Undergraduate Students and Information Technology, 2008
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The mission of the EDUCAUSE Center for Applied Research is to foster better decision making by conducting and disseminating research and analysis about the role and implications of information technology in higher education. ECAR will systematically address many of the challenges brought more sharply into focus by information technologies.

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Foreword

There was a time when students expressed their rejection of heartless university bureaucracies by carrying signs reading “do not fold, spindle, or mutilate.” The ubiquitous punched card that gave them their slogan perfectly symbolized the reduction of human relationships to the level of the machine—most particularly, the computer.

Today, students are using information technology (IT) itself to fold, spindle, and mutilate received ideas about how personal relationships and communities operate. In social networking sites (SNSs), they’ve found one of those quintessential new forms that define a generation. This study’s Introduction by Nicole Ellison, assistant professor of telecommunication, information studies, and media at Michigan State University, tells us that SNSs are “fundamentally changing the fabric of the university” by helping students stay in touch with a broader range of people (and perspectives), by making it easier for relationships to form, and by providing a new channel for interaction with classmates.

Where students lead, institutions must follow, and the ambition of the EDUCAUSE Center for Applied Research (ECAR) in its annual studies of undergraduates and IT has always been to help the two stay connected. The tendency for IT to serve up hot new topics on short notice hasn’t always made that easy, so with this fifth study we introduce a new element in our survey design: a focused special topic that supplements the more general core information that, with appropriate changes, we track from year to year. The social networking results presented here in Chapter 6 are the first fruit of what we hope will become a tradition of cutting-edge research on emergent (but still reasonably “ripe”) topics.

It didn’t take a lot of agonizing for us to choose social networking as our premiere focus topic. Our 2006 and 2007 studies told us that use of SNSs rose in one year from 72% to 80% among students at institutions that took part in both surveys. Facebook had become a classic example of dorm-room entrepreneurialism, the news was full of sometimes lurid stories of cyberstalking and naive self-expression on SNSs, and “Web 2.0” was driving a new investment boom in Silicon Valley. The need for some empirical information about this new phenomenon was clear.

So what did we discover? Reading Chapter 6 is the best way to find out, but overall we confirmed the extraordinary popularity of SNSs (85% of respondents use them, and an amazing 95% of those 18–19 years old), and we also found that students are neither obsessed with them nor careless in the way they share information about themselves.
Most of our respondents spend 5 hours or less per week on SNSs, and almost 9 in 10 place access restrictions on their profiles. Some students vociferously objected in their written comments to any institutional intrusion into SNSs; others seemed to keep the door open at least a crack. Yet it’s clear that, like other more traditional forms of student socializing, SNSs make a contribution to academics. Half of students report using SNSs to communicate with classmates about course work—almost 10 times the rate of those who say they use them to communicate with instructors. This is surely a place for institutions to tread carefully, if only to avoid the risk of stifling organic relationships that bring more benefit than any “official” initiative can. But regardless of how the institutional presence evolves, we can have little doubt that colleges and universities concerned about the quality of their communities have an interest in what goes on in social networking.

Besides our social networking focus topic, of course, our 2008 study continues to report on topics our past studies investigated, including students’ ownership and use of technology, their self-assessment of their skills, and their perspectives on how IT affects their engagement and success in course work. One of the most significant trends we report this year is the continuing “mobilization” of the student body. Laptops continue to gain as the computer platform of choice, and two-thirds of our respondents report owning an Internet-capable cell phone, though a variety of barriers—probably high monthly data-access fees above all—mean that only a fraction use their portable devices to access the Internet. That caveat notwithstanding, it appears that the stage is set for a potential tidal wave of new student demands for mobile device support. We also report that students have had generally positive experiences with course management systems and tend to agree that IT services are available for course work when needed, but they are more critical about their instructors’ ability to use IT effectively in courses.

As always, this year’s study required much collaboration and mutual support. For the second year in a row, our principal investigators Gail Salaway and Judy Caruso have coauthored a crisp and fascinating study. Caruso, who has been involved in every student study we’ve conducted since the series inception in 2004, managed a complex institutional review board (IRB) process with finesse and led the student focus groups that contribute so much of this study’s flavor. Salaway contributed excellent methodological skills and an unbending concern for clarity and precision. ECAR Fellow Mark Nelson once again brought his qualitative research skills to bear on the survey’s open response questions. We also thank our colleague Julie Little, interim director of the EDUCAUSE Learning Initiative, for her expertise and careful review of the study text.

We owe a great deal to our colleagues and friends at institutions of higher education. Ellison, one of the pioneers in the blooming field of SNS research, contributed a fine Introduction that we recommend highly to anyone interested in what participants really get out of SNSs. She also reviewed the study text and made many valuable contributions to our analysis. We’re grateful as well to James Jonas, Information Services/Electronic Resources librarian at the University of Wisconsin–Madison, for his assistance with our literature search.

From the beginning of our work on undergraduates and IT, we’ve been conscious of the sensitivities that surround the study of student populations. We could not possibly carry out the laborious and complex coordination of IRB approvals without the generous assistance of individuals at participating institutions, and we are further indebted to them for developing random samples.
of their freshman and senior populations
and for deploying the survey. One measure
of our obligation is that these colleagues
are too many in number to name here, so
we direct the reader to Appendix A to find
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Ron Yanosky
Boulder, Colorado
Executive Summary

I don’t look at it as “getting on the Internet.” The Internet is a part of life. It’s a lifestyle.
—An undergraduate student

For today’s traditional-age undergraduates, information technology (IT) plays an integral role in their everyday lives. They actively use many different technologies for school, work, and recreation. They adopt new technologies when they perceive the benefits and costs are aligned. They report a wide range of preferences, uses, skills, and opinions about IT in the academic context. And many of these views and practices change quickly over time.

In this fifth annual study, the EDUCAUSE Center for Applied Research (ECAR) again employs analytics to better understand undergraduates’ experiences with IT and how they are evolving. The purpose of the study is threefold:

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

The 2008 survey that informed this study has two components. First, as in previous years, the core survey queries undergraduates about their use of, and skill with, technologies and their perceptions about the impact of IT on their academic experience. In addition, ECAR believes that there is value in providing more in-depth findings about specific topics that are both relevant and timely to higher education. For 2008, the survey therefore included a focus area topic about social networking sites (SNSs)—a technology that students are enthusiastically adopting and that is already changing the social fabric of universities. Nicole B. Ellison, assistant professor of telecommunication, information studies, and media at Michigan State University, provides the Introduction to this study (Chapter 2), describing her perspectives and research about the impact of SNSs on both students and the academic community.

Methodology

The 2008 study builds on previous ECAR studies of undergraduates and IT and uses a multipart research approach that includes

- 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 and students at 8 two-year institutions;
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◆ student focus groups, which provided qualitative data from 75 students at four institutions;
◆ analysis of qualitative data from 5,877 written responses to the open-ended survey question; and
◆ a comparison of longitudinal data collected in the 2006, 2007, and 2008 surveys, where available.1

The great majority of the 27,317 student respondents are among those commonly called traditional students—under 25 years of age (78.8%), attending a four-year institution (87.8%), and going to school full time (84.0%). Most attend public institutions (74.8%), and about a third (32.3%) attend institutions with enrollments greater than 15,000 students.

Key Findings

Undergraduates had much to say about their experiences with IT, and many themes and findings emerged from their responses. The following stand out as especially interesting or relevant to helping college and university administrators as they make investment and priority decisions about IT deployment at their institutions.

Mobility: Laptops and Internet-Capable Cell Phones

Laptops continue to gain as the computer platform of choice. This year, 80.5% of respondents own them, and longitudinal data for just 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. Most freshmen at four-year institutions have new laptops when they enter college—with 71.1% owning one that is less than a year old. Most respondents (68.9%) own a computer of some type that is two years old or less, well within recommended equipment replacement cycles. However, about one-sixth of respondents (16.8%) have a computer four years old or older, more likely to encounter reliability and/or performance problems. And 1.5% of respondents still don’t own a computer at all.

Colleges and universities are tracking the maturation and price points of converged mobile handheld devices as a platform for providing IT services to students. ECAR data show that Internet-capable cell phones are now owned by fully 66.1% of respondents. Yet, most do not take advantage of the Internet capability, citing high cost, slow response, and difficulty of use as primary reasons. Despite these barriers to use, ECAR finds that 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.

Computer and Internet Activities

ECAR respondents spend an average of 19.6 hours per week actively doing online activities for work, school, or recreation. Although more than two-thirds (69.0%) spend 20 hours or less, about 1 in 14 (7.4%) spends more than 40 hours per week—in the range typically considered a full-time job. Time spent online varies by major, with engineering majors using the Internet most often (mean of 24.8 hours per week) and life/biological sciences and education majors using the Internet least often (means of 17.9 and 17.6 hours per week, respectively). Community college students show significantly less overall time online (mean of 14.8 hours per week). Today, almost all respondents report using high-speed access to the Internet; only 1.9% of respondents report still using dial-up services.

For undergraduates, technology is first about communication. After discovering in previous surveys that e-mail use is ubiquitous,
the ECAR survey did not ask about it this year. A much newer mode of communication, social networking, has become nearly ubiquitous as well: 85.2% of respondents use SNSs (primarily Facebook), and most do so on a daily basis to keep in touch with others. Text messaging (used by 83.6%) and instant messaging (IM) (used by 73.8%) are immensely popular, especially among younger students. More than one-third of respondents are also interactive on the Internet by contributing content to blogs, wikis, and photo or video websites.

Students are also actively involved in creating visual and audio media. About one-third of respondents (males more than females) use audio-creation or video-creation software, and 73.9% use graphics software (Photoshop, Flash, or the like). Further, highly interactive games are popular, with almost one-third of respondents (more males than females) engaging in online multiplayer computer games such as World of Warcraft, EverQuest, and poker. And the emerging online virtual worlds (such as Second Life) are already being used by about 1 in 11 respondents (8.8%).

**IT Skills and Internet Literacy**

ECAR survey respondents generally perceive that they are “fairly skilled” to “very skilled” in core applications used for course work—presentation software (such as PowerPoint), spreadsheets (such as Excel), course management systems (CMSs), and the college/university library website. Seniors report higher skills than freshmen in using spreadsheets and the college/university library website, reflecting experience gained from taking more courses. Gender differences are not great, with the exception that males report much stronger skills in 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 reports about their ability to “use the Internet effectively and efficiently to search for information,” with half rating themselves as “very skilled” and another third rating themselves as “experts.” Further, about half of respondents 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.”

Many educators believe that students’ perceptions about their IT skill levels and Internet savvy are questionable, characterizing their approach to information literacy as do-it-yourself and often relying too heavily on peers rather than on library staff or faculty. In addition, students may have confidence because they are unaware of the complexities involved or just because they have grown up with technology. This potential gap between actual and perceived skills and literacy is important to understand and factor into strategies for teaching and learning at the institution.

**IT in Courses**

Although respondents are generally enthusiastic about IT, most say they prefer only a “moderate” amount of IT in their courses (59.3%). This finding has been consistent over the past five years’ studies, even as new technologies have emerged and the overall digital environment has become increasingly dense. It suggests a widespread perception among students that IT resources are best situated in a variety of other learning environments. Especially, respondents emphasize that technology should not eclipse valued face-to-face interaction with instructors.

Males prefer somewhat more IT in courses than females. 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. In 2007 the difference was slight, and ECAR speculated that we might see a trend away from age as a differentiator (which the 2008 data now validate). This finding likely reflects that technology is becoming increasingly integrated into the lives of students of all ages.

Respondents identified which technologies they were actively using as a part of their courses during the quarter/semester of the survey (February 15 through April 7, 2008.) Several basic technologies were used by many respondents during that term—college and university library websites, spreadsheets, and presentation software. For these and other technologies used in courses, student major plays a key role. Engineering and physical sciences majors used more programming languages and discipline-specific IT; business and engineering majors used more spreadsheets; and fine arts majors used more graphics, audio-creation, and video-creation software. Community college students showed less use of technology in courses during this time. Of special note is that although few respondents (4.2%) used podcasts this quarter/semester, student comments from focus groups and from the survey were extremely positive about podcasts as a supplemental tool for courses. This mimics last year’s finding.

ECAR also asked students if they liked to learn using specific types of technologies. The most frequently cited item was running Internet searches (80.2%). More than one-third of respondents (44.3%) say they like to learn through text-based conversations over e-mail, IM, and text messaging or by contributing to websites, blogs, or wikis (35.5%). Interestingly, a solid half (50.8%) like to learn through programs they can control, such as video games or simulations. This is important in the context of discussions about digital game–based learning in higher education and whether the extent of learning justifies the resources required to implement a game.4

ECAR was interested in the extent to which students participate in online courses, especially considering earlier years’ findings that most students prefer a balance between technology and in-class interactions. Only 11.9% of respondents were taking one or more online courses at the time of the survey, and only 2.8% were taking exclusively online courses. This makes sense, given that the ECAR survey respondent base is heavily weighted with so-called traditional students. In fact, part-time students and older students were more likely to be taking online courses.

Asking this question triggered many written comments about online courses. Positive comments pointed to convenience and the ability to take courses that would otherwise be unavailable to a student. The majority of comments, however, were negative. Four themes emerged—that the lack of face-to-face interaction detracts from learning, that online courses facilitate cheating, that technical problems still exist, and that online courses require students to “teach themselves,” making the courses more demanding.

Further, some institutions are considering the value to students of experiencing online courses. ECAR therefore asked students if during their college career “it would benefit students if my institution required students to take at least one entirely online course.” There is a resounding lack of support for this idea, with only 23.0% of respondents in agreement. The negative response is likely due both to the lackluster response to online courses as well as to students’ taking issue with the idea of making the course a “requirement.”

Currently, 82.3% of respondents have used a CMS, most of them using it several times per week or more often. At four-year institutions, only slightly more seniors (85.3%) have used a CMS than freshmen (77.1%). Among respondents from the eight
participating community colleges, 60.1% have used a CMS. Consistent with previous years’ findings, respondents generally like using a CMS; 57.8% of respondents say their CMS experience is positive, and an additional 11.7% go so far as to say their experience is very positive. However, about 1 in 20 students (5.3%) do report an overall negative experience with CMSs.

In response to previous years’ comments from students about course problems related to reliability of CMSs, networks, and other IT services, ECAR asked directly about the availability of IT services for course work. Half of respondents (49.8%) agreed with the statement “My institution’s IT services are always available when I need them for my course work.” One-third (33.4%) were neutral, and 16.8% disagreed. Clearly, from a student perspective, there is room for improvement in the performance of most campus IT infrastructures and services.

Instructor Use of IT in Courses

As in previous years, hundreds of students commented about the link between technology, instructors, and learning. Qualitative analysis shows that the themes expressed in 2008 are consistent with those from last year (see the 2007 study report for an in-depth analysis). To supplement ECAR’s understanding of issues that came up in previous surveys’ qualitative remarks, the 2008 survey asked students three specific quantitative questions about instructor use of IT. ECAR finds that fewer than half of students think that most of their instructors use IT effectively in courses. The data show that

- two-fifths of respondents (44.0%) report that most of their instructors use IT effectively in courses,
- one-third of respondents (34.1%) report that most of their instructors provide students with adequate training for the IT the instructor uses in his or her course, and
- one-third of respondents (35.2%) report that most of their instructors understand the IT skill levels of their students.

Students who are positive about their CMS experience are much more likely to think that more of their instructors use IT effectively than those who report negative CMS experience. Similarly, respondents who agree that their institution’s IT services are always available when needed for course work are also more positive about instructor use of IT in courses.

The Impact of IT in Courses

How does higher education’s use of IT impact student success? This is a bottom-line concern for both educators and administrators and has been an ongoing challenge for decades. Adding a technology component to the mix means factoring in issues such as information literacy and emerging technologies. Still, the ECAR survey provides a valuable opportunity to learn more about how students perceive the impact of IT on their academic course work. To this end, ECAR designed questions about each of three important dimensions of student success.

- 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% of respondents agree).
- Convenience: “IT makes doing my course activities more convenient” (65.6% of respondents agree).

Convenience is the clear front-runner. Each year, in both the quantitative data and the qualitative data, respondents tell us that convenience is the most valued benefit of IT in courses. Still, 9.4% of 2008 respondents disagree with the convenience statement. With respect to learning, almost half of respondents (45.7%) agree that IT in courses improves their learning; another 39.3% are
neutral, and 15.1% disagree. Perceptions about IT’s impact on courses are consistent across most demographic factors, with a few exceptions. Engineering and business majors agree slightly more with all of these statements about IT in courses.

What are the common characteristics of respondents who are positive about the impact of IT? This cadre of students describe themselves as preferring more IT in their courses and as early adopters of technology. They are more positive about their experiences with CMSs and with the availability of campus IT services when needed for courses. Most important, they are more likely to say they have instructors who use IT effectively.

**A Digital Divide**

ECAR asked respondents to describe themselves in terms of technology on two dimensions—how much IT they preferred in their courses and how they adopt technology (from leading edge to trailing edge). Responses to each question form a traditional bell-shaped curve, indicating a wide range of views, from those who prefer extensive IT in courses and adopt technologies early to those who prefer limited or no IT in courses and adopt technologies only when necessary. Overall, student preferences for IT in courses and adoption practices do not vary significantly with age, class standing, or Carnegie classification. But they do differ when it comes to gender. For example, half of males (52.8%) consider themselves early adopters of technology, compared with only one-fourth of females (25.2%).

These different segments of undergraduates report very different experiences when it comes to technology. Those who are more technology oriented report that they experiment with new technologies and want to use them in courses. They spend more time online and accessing the Internet from cell phones and are more engaged in sophisticated software such as that used for creating graphics, audio, and video. They largely view technology as having positive outcomes on their course work. In contrast, those who identify themselves as not very technology oriented prefer less IT in courses and are less likely to claim strong IT skills in the basics required for courses—CMSs, presentation software, and spreadsheets. They are less likely to view technology as having a positive impact on their course work.

This self-described “digital divide” highlights the reality that a one-size-fits-all technology strategy for teaching and learning may not be as effective as one that explicitly factors in the differences between these high-tech and low-tech groups.

**Social Networking Sites**

Ellison’s Introduction to this study describes the fast-paced evolution and adoption of SNSs and how, after just a short few years, SNSs play an essential role in the lives of college and university students. Her essay is itself evidence that after several years during which journalism and pop cultural analysis dominated discussions of social networking, researchers are now taking SNSs seriously, studying a broad range of related issues. ECAR, as well, was prompted to ask undergraduates about SNSs.

**SNS Users’ Profiles**

Overall, 85.2% of respondents are now 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—show that for the 44 institutions that participated in all three years’ surveys, the percentage of respondents who use SNSs has increased, from 74.8% to 88.8%. But the striking change is in how many respondents now use an SNS on a daily basis, up from 32.8% in 2006 to 58.8% in 2008. 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
Virtually all respondents 18 or 19 years old use SNSs (95.1%), in contrast with about half of respondents aged 25 or older (50.2%). Facebook is currently the SNS of choice at doctoral, master’s, and bachelor’s institutions, while MySpace is the SNS of choice at associate’s institutions. Seniors, closer to entering the workforce, are more likely to use the growing career SNS LinkedIn than are freshmen.

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.

Most respondents (55.8%) spend 5 hours or less per week on SNSs, and another fourth (26.9%) spend between 6 and 10 hours per week. What are students doing with all of their time on SNSs? Hands down, the most common use is to stay in touch with friends (96.8%). Repeatedly, the open-ended survey comments 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. Two-thirds of respondents value SNSs as a way to share photos, music, videos, and other works; about half report using SNSs to find out more about people, to plan or invite people to events, and to communicate with classmates about course-related topics. For these activities, younger students are more active.

Perhaps most interesting to colleges and universities is the finding that half of SNS users (49.7%, and females more than males) have integrated SNSs into their academic life as a mechanism for communicating with classmates about course-related topics. 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 about the involvement of instructors in their SNS lives—many being adamant that social networking sites should be the exclusive realm of students, but others liking the idea of interacting with instructors and using the same SNS mechanism they already use to communicate with friends and classmates.

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 is that they are just not interested, and two-fifths say they actually don’t like SNSs. However, a significant number of respondents point to security concerns (19.0%) and privacy concerns (34.6%), and some of these might choose to use SNSs if they believed that privacy and security problems were remedied.

SNS Privacy and Security

Much attention, from both the popular press and researchers, has focused on SNS privacy and security issues. Are undergraduates at risk for identity theft, harassment, or other misuse of personal information? ECAR asked students their opinions about basic privacy concerns, and also about their practices to prevent exposure—what they reveal about themselves on SNSs and to what extent they place restrictions on access to their SNS profiles.

It is common for all age groups to reveal their first name and personal photos on SNS profiles (about 90%). 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, with the following exception: Females report revealing less information that is especially helpful in identifying them directly—last name, cell phone number, and home phone or address.

Overall, SNS users do not appear to be overly concerned about privacy and security issues. Only about half of respondents (54.4%) are at least moderately concerned that their information will be misused. None of the concerns ECAR asked about—misuse of information, security problems (for example, exposure to files with viruses), cyberbullying or cyberstalking, and leaving a history that could cause problems (such as when applying for a job)—led even one-third of SNS users to characterize themselves as “very concerned” or “extremely concerned.” Females are more concerned than are 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 information.

Why this lack of strong concern? One possibility is that students who say they are less concerned may just be unaware of the risks inherent in SNSs. Alternatively, since SNSs have capabilities for protecting personal information, it is likely that respondents who do actively place restrictions and/or take care in what they put on SNSs factor that into their answers and express less concern. In fact, most respondents using SNSs do put restrictions on who can access their profiles (87.4%), and nearly half (45.4%) say they put a lot of restrictions on them. Females are more likely to place restrictions and to place more restrictions than males. Younger respondents are somewhat more likely to do so than older respondents. However, older respondents are less likely to reveal personal information in the first place.

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. This suggests that understanding the risks and consequences of security and privacy exposure along with understanding methods of protecting personal information can help students choose what information they reveal and/or protect.

**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 do not skip classes. Instead, we found a widespread attitude that IT resources—no matter how students think about them—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.”
Upcoming: The 2009 ECAR Study

In 2009, ECAR will again conduct the survey of undergraduates and IT. The survey will be updated to reflect changes in technology and to incorporate what has been learned from the 2008 study. Questions about the use of IT in and out of courses and about student perceptions regarding the impact of IT on their academic experience will continue to form the core of the survey.

The 2009 survey will again feature a special topic area. Because many colleges and universities are now making decisions about delivering IT services to Internet-capable cell phones, the 2009 survey will ask students about their use of Internet-capable handheld devices. It will likely include questions about what services and content students use, or plan to use, and their opinions about these devices as a platform for accessing institutional IT services.

ECAR invites colleges and universities to participate in and support the 2009 survey and, in return, receive the data from their institution’s respondents. For more information, see the ECAR website, http://www.educause.edu/ECAR/Reference/StudentStudy/5822.

Endnotes

1. For comparison of 2006, 2007, and 2008 data, we used data from the 44 institutions that participated in the student study each of these years. Although the institutions are the same, they surveyed different students each year.


7. Students participating in the survey are assured that no confidential information about them will be made available to their institutions.
Introduction: Reshaping Campus Communication and Community through Social Network Sites

Nicole B. Ellison, Michigan State University

In the last few years, social network sites (SNSs) such as Facebook and MySpace have become standard fixtures on college campuses throughout the United States, and they now constitute an integral part of the daily communication practices for many students. For those of us involved in higher education, it is particularly important to understand SNS practices, outcomes, and motivations for use because these sites are fundamentally changing the social fabric of the university and thus a wide range of campus activities.

On a purely social level, they offer students vast amounts of information about one another—information that provides the impetus for social interactions that might not otherwise occur. When used as an organizing tool, they provide new ways for student groups to reach out to members, share information, learn about campus events, and mobilize support and action. Finally, although many instructors see SNSs as a distraction in classrooms with Internet access, their use is indirectly affecting teaching and learning practices as students use them to arrange study groups, talk about course work, and connect with classmates. In short, for many students, SNSs figure prominently in shaping their campus experience from the moment they check out their future roommate on Facebook to the day they join their school’s “alum” network.

Of course, SNS use is growing among other segments of society. Elsewhere, my colleagues and I have argued that SNSs are affecting greater society in important ways. First, SNSs enable users to manage large extended networks more effectively, including people we otherwise wouldn’t track, thus increasing our ability to access resources embedded in social relationships. Second, SNSs give us information about people we may meet in various casual encounters throughout our daily activities. This information can serve as a social lubricant, enabling new kinds of interactions that may have positive outcomes for individuals and communities. Third, these sites give individuals new ways of connecting with one another over shared interests, problems, or experiences and then to mobilize coordinated displays of support or action.

We see similar patterns of use unfolding on campuses across the United States. Due to their particular stage of psychological development and because they are such avid users of these sites, undergraduate students as a group are an especially fascinating focus for SNS researchers. For those of us who work with students inside and outside the classroom, attempting
to describe, measure, and understand changes introduced by SNS use on campus is even more compelling.

SNSs create new opportunities for educational institutions as well as new challenges. Universities must consider policy decisions that would have been inconceivable just a few years ago. For instance, should students who find something troubling in an SNS profile be allowed to change their assigned roommate before meeting him or her face-to-face? Should these technologies be incorporated into the classroom, and if so, how? What about student-instructor “friending”? Will students expect special treatment from professors who accept their friend requests? How should universities react to problematic SNS content: by imposing penalties, offering educational programs, or turning a blind eye? These are just a few examples of the kinds of questions now facing institutions of higher learning in relation to SNSs.

**Definitional Issues**

In an overview of social network sites we wrote for the *Journal of Computer-Mediated Communication*, danah boyd and I defined SNSs as “web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system.” As the above suggests, SNSs constitute a new medium that incorporates many aspects of earlier online modes of communication, such as personal web pages and messaging systems, but with new features that build upon the social network that is at the heart of these systems.

The SNS profile itself can resemble a personal web page (although the format is more constrained), with photographs and self-descriptive text. What differentiates SNSs from other, earlier forms of online self-representation is the articulated social network these sites enable and the ways in which they help users manage what can quickly become a large extended network of contacts. The social network is created when users of Facebook, MySpace, or other SNSs link to the profiles of others on the system (or, in the vernacular of many of the sites, they “friend” other users). Features such as Facebook’s News Feed or MySpace’s Friend Updates allow users to monitor all of their friends’ recent online activity on one page.

Depending on the site and the customized add-ons users choose to install, these sites provide users with a vast array of possibilities for creating content and connecting with one another. Users can share photos, music, blog posts, and videos with one another and can comment on content posted by their peers. They can join groups; affiliate with brands, organizations, or political causes; or search for others with shared interests. These sites host a variety of communication tools: synchronous and asynchronous, one to one and one to many, massively public and intimately private, ranging from the mundane to the perplexing (as with one third-party Facebook application that allows users to throw virtual sheep at each other).

**History and Usage**

SNSs have been around for more than a decade: The first SNS, sixdegrees.com, launched in 1997. The last few years have seen an increase in the introduction of new services, including the creation of LiveJournal and BlackPlanet (both 1999), Cyworld (2001), Friendster (2002), LinkedIn (2003), and YouTube (2005). SNS use has now become a mainstream online activity, most visibly for younger users. The Pew Internet & American Life Project, for instance, recently found that 55% of the teens (aged 12–17) surveyed had a profile on an SNS such as Facebook or MySpace. Publications from 2007 estimated that users spent about 20 minutes a day on
Facebook and other SNSs. However, this number has no doubt increased in the last year as these sites add new communication features such as instant messaging (IM), which encourages users to keep the program open in a window throughout the day. College students are particularly avid users. Estimate ranges depend on the particular campus, but it is clear that SNS activity is the norm rather than the exception. A full 85.2% of the students participating in the ECAR study reported joining at least one SNS; among Eszter Hargittai’s survey of the University of Illinois at Chicago first-year students, 88% were SNS users.

There are hundreds of SNSs around the globe, such as Orkut in Brazil, Cyworld in Korea, and Bebo in the United Kingdom. Two of the sites that dominate this space, especially among U.S. undergraduates, are MySpace and Facebook.

MySpace was started in 2003 and was embraced by bands seeking publicity and the ability to reach new and existing fans. Attracted by the possibility of connecting with bands and one another, teens soon gravitated to the site and began creating profiles that became increasingly elaborate as users learned to alter the profiles’ look and feel through code they copied and pasted from other websites. MySpace was purchased by Rupert Murdoch’s News Corp. in mid-2005 for $580 million, a sum that Fortune later claimed was low. Currently, MySpace has an estimated 110 million monthly active users, making it by far the largest SNS in the United States.

As suggested by the ECAR findings, Facebook is especially popular among college-aged students. Facebook was started in 2004 by a Harvard undergraduate, Mark Zuckerberg. It was originally limited to university students but then opened up to high school students and businesses and is now available to anyone. (Currently, Facebook claims that more than half of its user base is not associated with a college.) Facebook shares the general SNS characteristics of MySpace but offers less ability to personalize the appearance of one’s profile. Thus, the pages appear more uniform, which can be less daunting to older users and advertisers. Facebook also recently opened up its application programming interface (API), enabling hundreds of developers to create applications that extend Facebook’s functionality. Currently, Facebook receives between 22 and 25 million visitors each month.

MySpace and Facebook are two of the most popular sites on college campuses, but research suggests that there are systematic differences among users that affect which site (if any) they choose to use. Hargittai’s work suggests that demographic variables play a role in predicting whether students use Facebook, MySpace, or another site. She finds that women are more likely than men to use MySpace; that students of Hispanic origin are more likely to use MySpace, whereas white/Caucasian students are more likely to use Facebook; and that students whose parents have less than a high school degree are more likely to be MySpace users, whereas students whose parents have a college degree are more likely to be members of Facebook.

Facebook and Social Relationships on Campus

It is clear that students have embraced the social and technical affordances provided by these sites, but until recently there was little empirical research that examined outcomes from and motivations for SNS use. Although it has shifted a bit in the last year or so, for a long time media coverage of SNSs on campus focused on negative outcomes, such as privacy concerns or poor self-presentational choices that diminished students’ attractiveness to employers or got them in trouble with campus officials and law enforcement. Typical popular-press titles include “Alarms Sound over Athletes’ Facebook Time” or “Cop Snares College Pals in Own Web.”
A few years ago, my Michigan State University (MSU) colleagues Charles Steinfield and Cliff Lampe and I noticed a discrepancy between the high usage we saw among undergraduates at our institution and the negative outcomes prevalent in the popular narratives that circulated about Facebook and other SNSs. We began a program of research focusing on Facebook use and social capital to understand more about the motivations for student use of Facebook and to describe the benefits, if any, they might be receiving from such use. Although our research has focused on Facebook use among undergraduates, many of these trends can be seen in other SNSs and populations.

Benefits of Facebook “Friends”: Research on Facebook Use and Social Capital

Our research uses social capital as our theoretical lens, which gives us a grammar for describing the kinds of benefits we suspected students might be experiencing from their use of Facebook. Social capital refers to the benefits we receive from our relationships with others. In his well-known book *Bowling Alone* (2000), Robert Putnam examines patterns of social capital in the United States and describes some of the reasons why this valuable resource might be declining.13 Putnam discusses two kinds of social capital. We typically get bonding social capital from our close friends and family; this comes in the form of emotional support and tangible resources. If we need a shoulder to cry on or money to cover this month’s rent, these are the people we turn to. Bridging social capital, however, is important as well. Bridging social capital is associated with our “weak ties”—people we are not particularly close to, such as friends of friends. These people aren’t likely to loan us money, but they are more likely to provide us with access to diverse perspectives and new information. Also, because we interact with close friends more frequently, we tend to know what they know. This isn’t the case with weak ties, and in fact research has shown that we are more likely to receive information about an employment opportunity from someone we see rarely, a pattern sociologist Mark Granovetter (1973) describes as the “strength of weak ties.”14

The notion that SNS use might be associated with larger networks of weak ties and thus higher levels of bridging social capital was something we suspected when we developed our Facebook study. For the past three years, we have surveyed MSU undergraduates about their use of Facebook and other variables such as social capital. Our first survey, fielded in April 2006, revealed that intensive use of Facebook was associated with higher levels of all three kinds of social capital we examined: bridging (the benefits associated with weak ties, such as new information and diverse perspectives), bonding (emotional and tangible support garnered from close friends and family), and maintained social capital (a concept we developed to describe the ability to mobilize resources from a previously inhabited network, such as one’s high school). Intensive use of Facebook was a significant predictor of bridging social capital. Interestingly, general Internet use was not, suggesting that only certain kinds of Internet activities are related to the creation and maintenance of bridging social capital. We also found similar patterns for bonding and maintained social capital, although the effects were not as strong.

However, our cross-sectional survey data didn’t allow us to determine the causal direction of our findings. Our results could indicate that heavy users of Facebook gain social capital through their use, but it may also be that individuals who start out with higher levels of social capital tend to use Facebook more. For insight into this and other questions, we approached our respondents one year later and invited them to take the survey again. When we examined the responses of...
only those who took the survey both years, we were able to argue more conclusively that Facebook use precedes gains in bridging social capital. The relationship between Facebook use at the first survey and social capital at the second survey was much higher than the correlation between social capital at the first survey and Facebook use at the second survey.15

Critical-thinking skills and expertise in one’s field of study are essential objectives of the college experience. But higher education should also develop other relevant skills, such as learning how to initiate and maintain different kinds of social relationships and successfully manage one’s online self-presentation. And community building, after all, is one of higher education’s key concerns. SNSs can be a significant tool in assisting students as they learn these kinds of skills, which will be increasingly important for them as they develop into successful citizens, community members, and professionals.

**Social Aspects of SNS Use**

Although more work is needed to fully understand the mechanism behind our social capital findings, we can speculate on the basis of what we know about the technical characteristics of these sites and how they tend to be used. Facebook, for instance, has a number of features that support keeping in touch with one’s network of weak and strong ties. First, individuals have the ability to include vast amounts of information in their profile, ranging from musical preferences to an open-ended “About me” section. If they wish, they can populate a number of contact information fields, such as instant messaging screen name, phone number, and address. (In our most recent study, about a quarter of respondents listed their cell phone number on their profile, and more than two-thirds listed their instant messaging screen name.) One’s privacy settings determine who can view this information. Inclusion of contact information assists users in staying in touch, and our interview data suggest that some undergraduate students use Facebook as a makeshift contact list or address book. As one student told us, “Honestly, I can’t remember what I did before Facebook. It sounds really pathetic, but it’s just so easy to access information about people. It’s not bad information, it’s just instead of ‘Do you have this person’s phone number?’ or ‘Oh God, where do they live, they live in this dorm but I need the room number,’ it’s just so easy to just go on there and find it.”16

Second, the site itself offers a variety of tools that enable communication among users, useful when contact information isn’t available or a phone call would be awkward. These include public postings (the “Wall”); a web-based messaging system; a lightweight, content-free digital nudge known as a “poke”; and, most recently, instant messaging. In my own use of the site, I appreciate the fact that it enables me to keep in touch with people whom I wouldn’t normally track in my own address book, such as old high school acquaintances I will probably never see face-to-face (save for a once-a-decade reunion). Now, students at a party can ask those they meet to “Facebook me!” with the knowledge that this fleeting connection can be digitally revitalized at any time should the need or desire arise. Other sites have similar features that can help individuals, once they have made a connection, keep in touch with one another. For instance, Cyworld users can visit one another’s “minihomes” and leave notes in their guest book; MySpace allows users to send messages to one another, instant message others, or leave public comments for one another.

Third, many SNSs enable users to get updates about friends when these individuals have engaged in public activity on the site, such as making changes to their profile or commenting about a photograph. In Facebook, this is known as the News Feed.
when it was first introduced (individuals who weren’t comfortable with early implementations of the feature claimed it felt like stalking), users now seem to appreciate the ease with which it enables them to keep up to date on their friends’ activities on the site. Although some of this information is likely to be shared in phone, IM, or face-to-face conversations with close friends, being able to monitor the activities of weak ties enables these relationships to be maintained more easily.

Recently I updated my status in Facebook to announce I was celebrating my 10-year wedding anniversary. Among the congratulatory messages I received were two from my extended network of weak ties—one from a childhood friend whom I hadn’t seen in 25 years, and the other from an SNS researcher from Finland whom I met once at a conference. I enjoyed hearing from both of these people and without the use of an SNS would be unlikely to maintain contact with either of them. Of course, I enjoy seeing updates about these people as well and appreciate the ability to engage in lightweight social surveillance of their lives. Knowing what is going on in their lives—whether it’s a major milestone or a quotidian occurrence—makes future interactions more comfortable. Moments that might otherwise be awkward, such as seeing a vague acquaintance after a few months, are smoothed by these ready-made topics of conversation. Having a base level of information about others can help avoid awkward inquiries; anyone who has ever inadvertently asked about someone who has passed away or a relationship gone sour can understand the value of these tidbits of information in smoothing social interaction.

A valid question for many is, “What is the point of keeping in touch with people you wouldn’t otherwise talk to?” The concept of social capital allows us to articulate why these large networks of weak ties are important to us both as individuals and as a society. From a bridging social capital perspective, the benefits of keeping in touch with our weak ties are practical: new information, ideas, and opportunities. These might not be connections that are engaged often, but they can be harnessed when and if the need arises. For instance, one of our interview respondents described the way that she envisioned her high school friends would continue to use Facebook to keep in touch, and that even at their 40th reunion they wouldn’t hesitate to ask favors from one another.

The benefits of these SNS-enabled weak ties can also be psychological: Many of us enjoy reading a quick note of congratulation or a happy birthday wish, even if it’s from someone we don’t know that well. In fact, our research shows that the influence of Facebook use on bridging social capital is particularly strong for those with low self-esteem. As described above, bridging social capital is associated with exposure to new ideas and perspectives. This kind of social capital may be particularly important during the undergraduate years because the period between the ages of 18 and 25, which has been called “emerging adulthood” by psychologist Jeffrey Arnett, is important for psychosocial development. During this time, individuals are relatively free from the social expectations they experienced as teenagers or will experience as adults, and they can explore different orientations toward work, interpersonal relationships, and the world in general. Encountering new ideas, engaging in new experiences, and meeting diverse kinds of people are especially important during this time because they expose individuals to different life experiences and paths. Indeed, expanding one’s horizon is one of the hallmarks of the higher education experience. SNSs may be particularly helpful in this regard because they allow us to maintain a larger network of weak ties through mechanisms such as rekindled relationships from the past or the ability to maintain a connection with individuals who otherwise would exist as ephemeral connections—people we meet once and then never see again.
Friendship and SNSs

The ease with which SNSs allow individuals to connect with others and thus maintain these connections is a concern for some, who believe that this will somehow dilute the meaning of friendship. “How can someone have 500 friends?” is a common refrain asked by people who may not fully understand the meaning of “friends” in this context. Christine Rosen, for instance, writes in *The New Atlantis*: “Friendship on these sites focuses a great deal on collecting, managing, and ranking the people you know. Everything about MySpace, for example, is designed to encourage users to gather as many friends as possible, as though friendship were philately.”19

Although for some the metaphor of friends as postage stamps to be studied may be apt, many of the Facebook users we’ve surveyed are very savvy about the wide range of relationships that are articulated as “friends” in Facebook. Other research on the topic supports this notion as well; boyd lists the reasons why someone might accept a friend request, including impression management (having lots of friends makes you look popular), politeness norms, self-expression needs, and getting access to content otherwise protected by privacy settings.20 Actual friendship is a reason, of course, but it is only one of many. I believe that the undergraduates who use Facebook are more aware of the ambiguities surrounding the “friends” label than we might think. In fact, in one of our studies we asked students to articulate how many of their Facebook friends were actual friends. It turned out to be about one-third, on average. In my assessment, Facebook doesn’t appear to be cheapening or threatening “real” friendships and in fact may be enabling its users to expand their social networks in positive ways.

Online and Offline Patterns of Communication

Many of the early forms of computer-mediated communication brought strangers together to discuss, argue, and provide support for one another. Indeed, the fact that the Internet allowed people to come together on the basis of interests, not accidents of geography, was celebrated: Think of Rheingold’s book *The Virtual Community* (although many of those participants were located in and around California’s Bay Area).21 Online dating is a similar case, because participants are specifically seeking individuals outside their existing pool of contacts.

SNSs are different because these sites often support connections between people who share some sort of offline connection, such as living in the same dorm or working at the same institution. Research suggests that students are using Facebook to supplement, not replace, face-to-face communication. Scott Golder and his colleagues found that Facebook use decreases during times traditionally associated with face-to-face socializing for college students.22 For instance, use of Facebook was higher during the week than on weekends and higher during breaks (such as the summer months and winter break) than during the school year.

SNSs and Past, Present, and Future Relationships

One useful way of thinking about Facebook and relationships is to consider past, present, and future relationships. Although the bulk of my research examines Facebook specifically, these trends will hold true for other SNSs as well.

Regarding “past” relationships, one of the primary uses of Facebook is to maintain connections with people from previously shared geographical (or other) places. For college students, this can mean acquaintances from high school or from their hometown. As these sites are adopted by a broader cross section of the public, we can expect to see them used to keep track of former colleagues, neighbors, or extended family in other cities. As I discuss above, one may
have Facebook friends whom one never sees, but the lightweight connections enabled by these services are helpful.

SNSs can also be used to maintain current relationships, although this use might not be as valuable to users because close friends usually use a variety of communication media to keep in touch. Features such as birthday reminders and invitations to parties and other events can support existing relationships. Close friends may use Facebook to share or comment on one another’s photos, allowing them to connect once in a face-to-face setting and again in a mediated context. In fact, Facebook is one of the most popular sites for sharing photos on the web.

The notion of SNSs supporting “future” relationships may be a bit misleading, but I believe the information available in SNSs can lower the barriers to initial communication and serve as a social lubricant, easing the way for relationships to form. Our research on Facebook suggests that typically individuals don’t browse the profiles of total strangers (as happens in other online contexts such as online dating sites) or try to “friend” them; more likely, the individuals have some shared connection with another person and then use the site to find out more about them. This shared connection could be a shared class or dormitory, a brief encounter at a social event, or a mutual friend. Identity information from Facebook (such as musical tastes, friendship networks, or political orientation) can then be used to initiate a face-to-face conversation.

This theme emerged again and again when we spoke with MSU undergraduates about their Facebook use. For instance, one of the undergraduates we spoke with told us that Facebook “just makes it a little bit more intimate in your friendships with people. And gets more information out there that…someone would feel weird asking me, like, what I like to do.” This individual (a male) explained that he enjoyed shopping for shoes, and that having this information in his profile had resulted in several conversations that wouldn’t have otherwise occurred.

Self-Presentation and Privacy

Facebook and other SNSs let individuals construct an online representation of self, but users are sometimes unaware of their audience or experience problems due to the different groups that converge in online spaces such as Facebook. For students, this may include close friends, distant friends, family, professional contacts, and professors. Privacy concerns are frequently mentioned in conjunction with SNS use, especially for younger users who may not be aware of the true audience for their online self-disclosures. Early work on the subject pointed out that although students claimed to be concerned about privacy, they were likely to include personal information in their SNS profiles. In one of the first academic studies addressing this topic, Gross and Acquisti examined thousands of student Facebook profiles and described the potential privacy threats they discovered. For instance, they argued it was possible to reconstruct users’ Social Security numbers using information commonly found in Facebook profiles, such as hometown and birthday.

Norms have changed since this early research: Features such as Facebook’s News Feed may have made individuals more aware of the true audience of their profile information, and recent surveys show that 66% of the online teens who have profiles limit access to their profile in some way; of those who don’t, about half include some false information. The ECAR data reveal similar trends.

Educational Uses of SNSs

Like many communication and information technologies, SNSs are being assessed for their potential to support classroom instruction and other activities. Instructors are drawn to them
for many reasons, chief among them being the pedagogical possibilities inherent in the social processes they support (for instance, identity information that might humanize a large lecture class) and the practical fact that these technologies are already ingrained into the daily communication practices of their students. As an EDUCAUSE report on Facebook stated, “Any technology that is able to captivate so many students for so much time not only carries implications for how those students view the world but also offers an opportunity for educators to understand the elements of social networking that students find so compelling and to incorporate those elements into teaching and learning.”

Among instructors, early adopters are using SNSs in the classroom in a wide range of ways. At one end of the spectrum, instructors are replacing more traditional media with SNSs as a way to broadcast course announcements, recognizing that Facebook messages are more likely to be seen by students who check Facebook on a daily basis but e-mail less frequently. Others hope to energize course material by capitalizing on the fact that a new medium is often more engaging and interesting (at least initially) for students than one they’ve experienced hundreds of times and that the identity information found in SNSs can reinvigorate online and offline discussions. It may be that students appreciate the convenience of using an SNS to receive course-related announcements (as opposed to logging into a separate course management system such as Blackboard or ANGEL), but this is not where the true opportunities for higher education are found.

The real opportunities will be realized by instructors who infuse SNS practices into learning activities using sound pedagogical practices, drawing upon concepts such as digital literacy to articulate the instructional potential of these tools. Classes that take the technological, psychological, and sociological aspects of SNSs as a focus are natural contexts for this approach. BJ Fogg at Stanford is an innovator in this regard. In fall 2007 he taught a class focusing on creating Facebook applications; the following spring, he and his students examined Facebook from a psychological perspective. Reflecting upon the experience, he writes, “As a teacher and researcher, I find that dealing head-on with Facebook is the right approach. The students resonate with projects related to Facebook. They respond well to any assignments I give via a Facebook channel. And when they post work on Facebook, the students’ friends outside the class often comment. So I’m seeing lots of benefits. On top of that, by using Facebook I’ve learned a lot about the challenges students face, what matters to them, and how my approach to teaching can benefit them most. Finally, Facebook matters because it’s an indicator of what’s coming next. The changes Facebook has made in the last 14 months have rippled through the technology industry. You can’t understand what’s going on today—or what’s likely to happen—without understanding what makes Facebook tick.”

Not all instructors see the appeal of SNSs. Some are concerned about the increased (and, they believe, inappropriate) familiarity these sites may encourage between students and instructors; others view the sites as distractions from the real work of learning. Recent research by Haya Ajjan and Richard Hartshorne suggests that some instructors resist using Web 2.0 tools even though they recognize the benefits.

We will likely see new technical and pedagogical innovations in the near future as private companies, institutions, and individual instructors engage with novel teaching methods and create new technical tools to support student learning using SNSs. Inigral, for instance, has recently introduced a new Facebook application called Schools, which is currently being tested at pilot institutions such as Abilene Christian University.
acknowledging institutional needs for privacy and security, the tool integrates data from each school’s registrar to show students their friends’ course schedules and enables student-to-student communication. As founder Michael Staton explains, “Through testing an earlier version of our tool, Courses, we learned that students are not very interested in assignments and documents; they are much more interested in sharing and viewing information that helps them start or maintain a relationship with a classmate or friend, and a lot of that information is about school. We set aside our earlier project, Courses, and rebuilt it as Schools, which emphasizes features that support relationship-building and information-sharing in the academic context.”

Christine Greenhow is a researcher in learning technologies at the University of Minnesota’s College of Education and Human Development who has been studying the use of SNSs in educational contexts and is currently conducting research to explore what connections might exist between SNS participation and learning for teenage students. She argues, “I think the message for educators, especially K–12 and college undergraduate instructors, is that it’s more about teaching students how to use these tools to reinforce and develop the new learning competencies that are increasingly being called for. It’s not so much about putting curriculum or links to assignments inside these spaces—I think that’s a misuse and a misunderstanding of the opportunity these SNSs present—but knowing and supporting the ‘informal learning’ students are already doing in tandem with ‘formal learning.’”

The observation that students are using SNSs to support informal learning practices is supported by our survey data. Regardless of whether instructors are explicitly incorporating SNSs in their curricula, it is clear that students are integrating these tools into their educational experiences and that SNSs are influencing what happens in the classroom in a variety of direct and indirect ways. In April 2008 we asked a random sample of MSU undergraduates about educational uses of Facebook—specifically, whether students had engaged in various behaviors in the six months prior to the survey. (Note that 96% of our respondents reported being a member of Facebook.) Although only 10% of the MSU respondents said they used Facebook as part of an assigned class exercise, about half had used Facebook to arrange a study group or meeting, more than half had used it to discuss classes or schoolwork, and about one-third reported using Facebook to “collaborate on an assignment in a way that your instructor would like.” Most of our respondents (69%) had used Facebook to contact another student with a question related to class or schoolwork. The ECAR data presented in Chapter 6 of this study reflect a similar contrast between low use of SNSs for student communication with instructors and much higher usage for communication about class assignments between classmates. These social, informal, peer-to-peer discussions are important because this kind of on-demand, supportive interaction is now accepted as a valuable component of the learning process. The fact that they are happening on SNSs rather than on institutional CMSs suggests that SNSs may be challenging the careful plans of both CMS vendors and instructional technology administrators to provide “official” tools for student interaction and collaboration.

I believe that SNSs have real potential to be used to support teaching and learning practices, although their true utility will be for supporting informal, peer-to-peer exchanges and campus connections, as opposed to being utilized as a repository for documents or other traditional uses. The social affordances of SNSs, such as making identity information more salient during class discussions or supporting peer-to-peer connections, can
accommodate different learning styles inside and outside the classroom. SNS activity doesn’t have to be limited to course-related activities. At a broad level these tools should be leveraged as environments in which students have the opportunity to practice managing their online self-presentation within the relatively safe confines of the university (as opposed to after graduation in the “real world”). Finally, and most important, SNS use has the potential to help students hone their digital literacy skills, which will be increasingly critical as they transition into successful digital citizens and professionals.

SNSs and Campus Life

Students and faculty aren’t the only ones using SNSs. Other groups on campus have also started to explore ways to incorporate SNSs into their activities. Some universities, such as the University of Miami, have started to purchase Facebook ads to promote intramural sports. Other institutions have explored using SNSs to recruit new students, to keep in touch with alumni, and to gain insight into campus trends. University libraries and librarians have been particularly engaged in finding new uses of SNSs. For instance, libraries can create groups that let them communicate with their patrons, and a few libraries have created Facebook applications that let users conduct literature searches from within the site.

Campus administrators would do well to explore how to harness the social connections that SNSs support. One study that examined Facebook use on campus found that student use of Facebook was positively correlated with feelings of connection to the campus, and anecdotal evidence of this is easily found. For instance, in the aftermath of the Virginia Tech shooting, students used Facebook to mourn, support one another, and share information. In short, the next few years promise to reveal more varied uses of SNSs on the campus as SNS companies continue to innovate and as users continue to adopt and adapt these services.

Areas of Concern

Given these trends, many institutions are wondering how and whether to enact formal policies about SNS use on campus. Administrators, faculty, and staff within institutions of higher education need to consider a number of issues when pondering questions such as whether these tools should be used to submit graded assignments. First, the private companies that run many SNSs are not accountable to the university; they may change their terms of use and intellectual property and privacy policies at their discretion. Additionally, any instructor or institution that relies on a third-party site to host student material that will be graded needs to be aware that this content (or the site itself for that matter) could disappear at any time and may not be archived. Obviously, this is unlikely to happen with a popular service such as Blogger, Facebook, or MySpace, but it is something instructors should reflect on when assessing the trade-offs between in-house applications and third-party tools, which may be more technically sophisticated and more likely to be used by students after they graduate.

Additionally, there are ethical considerations that surround the formal use of SNSs within the classroom. For instance, is it appropriate to mandate that students become members of a commercial enterprise that seeks to monetize their attention through advertising revenues? In a related vein, the Family Educational Rights and Privacy Act (FERPA) prohibits the public release of certain kinds of information. A problematic scenario may arise if, for instance, a student’s participation in a particular course-related group is mandatory and this membership information is available to the general public through the SNS.

Perhaps most important to consider is how students will view the incorporation of SNSs in their formal academic lives. Student resistance is a reason to tread cautiously in this arena. Students may associate SNSs
with a specific set of practices; for many, it is a playful environment separate from their academic pursuits. Reminding them about a final exam via Facebook may be the equivalent of showing up at a frat party on a Saturday night with some calculus problems to solve—and just as welcome.

Similarly, it is worth considering the relationship between instructors and their students and how this might be affected by the “friending” mechanism available on most SNSs. As a recent piece in The Chronicle of Higher Education pointed out, “friending” between instructors and students is uncharted territory. Even instructors who aren’t interested in exploring SNSs in the classroom are faced with decisions about their own SNS use. For instance, should instructors post public profiles on these sites? If so, what information is appropriate to include? Including one’s musical tastes is unlikely to invite controversy, but what about religious beliefs, sexual orientation, or political affiliation? Should students and instructors be Facebook friends? Will friended students expect preferential treatment, as some instructors fear? Is it ethical for instructors to use information they gather from SNSs when deciding whether to accept students’ excuses about missed exams or to grant paper extensions? Will students think a friend request from an instructor is creepy?

Norms regarding many of these issues are still in flux, although some have begun to calcify. Regarding student-instructor friending, many instructors allow students to initiate contact or friending, and some prefer to wait until the course is over to accept these requests. Early exploratory research on the issue reported some student resistance to faculty presence on Facebook but found that contact on Facebook did not affect student evaluations. The same study found that about one-third of the students surveyed did not believe that faculty should be present on Facebook at all. More positive results were found in a 2007 experimental study, which found that students who were exposed to an instructor’s highly disclosive Facebook profile anticipated a better classroom climate than students who saw a profile that was lower in self-disclosure, with similar results for other variables such as motivation. Although positive open-ended comments by participants suggested that the self-disclosure encouraged students to find common ground with the instructor, negative comments betrayed a concern that the profile wasn’t “professional enough for a college-level professor.” The authors also caution that although the majority of the respondents reported positive perceptions of the Facebook profile, instructors should be cognizant that students might resent a lack of consistency between an instructor’s online self-presentation and classroom teaching style.

Unfortunately, little research is available that assesses the educational effectiveness of SNS tools. We need to conduct research that examines SNSs from an educational perspective and considers sound pedagogical principles in conjunction with assessments of the tools and the social practices that accompany their use. As Greenhow explains, “Most of the research that has been done on SNSs to date has been done outside the field of education and has tended to focus on network structures, friendship characteristics, and privacy issues. There is little that looks at their connection to learning and the educational benefits they may bring.”

**Conclusion**

The classroom has changed much in the last 20 or 30 years. Norms concerning student-instructor interactions, campus codes of behavior, and instructional style have evolved in unexpected ways. Teaching and learning practices have evolved as well. Spurred in part by the changes encouraged by SNSs, learning activities that happen outside the classroom are acknowledged by many to be as important as what happens inside it. Three hours a
week is simply not enough time to influence the wide range of learning outcomes that institutions of higher learning want to affect—outcomes that transcend the acquisition of information and include ways of interacting with the world, exploring identity issues, and forming and maintaining social relationships with peers. As I’ve tried to outline above, SNSs may be able to support these processes in vitally important ways. As these services and our use of them evolve, the next few years promise to be a very exciting time for students and those of us who support their development inside and outside the classroom.

Endnotes
2. Although the term social networking sites is used frequently, I choose to refer to these sites as social network sites. As danah boyd and I write, “‘networking’ emphasizes relationship initiation, often between strangers. While networking is possible on these sites, it is not the primary practice on many of them, nor is it what differentiates them from other forms of computer-mediated communication (CMC).” See danah m. boyd and Nicole B. Ellison, “Social Network Sites: Definition, History, and Scholarship,” Journal of Computer-Mediated Communication 13, no. 1 (2007): 210–230.
16. Ibid.
26. Even traditional course management systems such as Blackboard are getting in on the act. Blackboard recently announced a Facebook application that informs users when changes are made in their Blackboard account.
32. Matthew Robert Vanden Boogart, “Uncovering the Social Impacts of Facebook on a College Campus” (MS thesis, Kansas State University, Department of Counseling and Educational Psychology, 2006).
Methodology and Respondent Characteristics

I'm all for IT: I completed this entire survey via my iPhone.
—An undergraduate student

The ECAR study of undergraduates and information technology (IT) is designed explicitly to help inform college and university leaders, technology staff, and faculty as they make critical decisions about their institutions’ technology investments and implementations. ECAR collects, analyzes, and makes available both qualitative and quantitative data that profile undergraduate use of technology in general, that is relevant to administrators in deploying the overall campus technology environment, and that is useful to instructors and instructional technology staff as they decide how to incorporate IT into the curriculum.

This 2008 research of undergraduates and IT marks ECAR’s fifth annual study. In 2004, the first ECAR study was launched with a baseline of 13 institutions; this year, 98 U.S. institutions participated, along with two international institutions—one from Ireland and one from Spain. The data presented in this study reflect only the results from student respondents of the U.S. institutions.

Each year, questions about undergraduate use of IT in and out of classes and about student perceptions regarding IT’s impact on their academic experience form the core of the survey. Starting in 2008, the survey adds value by also including a special focus area—a more in-depth set of questions about a topic (which changes each year) that is currently important to higher education. For 2008, ECAR chose student use of social networking sites (SNSs) for the survey focus area, adding research-based information to the already widespread discussion about student adoption of SNSs and their impact on colleges and universities.

Methodology
The 2008 study builds on and extends previous studies and consists of the following data collection and analytical initiatives.

Literature Review
A literature review was conducted (extending the 2007 literature review), along with a review of other relevant surveys. The bibliography appears in Appendix E.

Web-Based Survey
A web-based survey of college and university undergraduates supplied the quantitative data about student experiences with IT in higher education. The 2008 survey was based on the 2007 survey, with improvements made to some core questions and to the survey structure overall, and a section was added to include questions about the focus area (student use of SNSs). The survey questionnaire appears in Appendix B.
Institutions were asked to sample their freshman and senior students. Each university used a different sampling model, and a number of them chose to include their entire freshman and senior classes. In the absence of weighting of institutional responses, this means that the results can be generalized to the sampled students but not to the 98 institutions.5

**Student Focus Groups**

ECAR collected qualitative data by means of student focus groups at University College Dublin; the University of North Carolina, Pembroke; Coppin State University; the University of Maryland, Baltimore County; and Presbyterian College. The interviews included as diverse a group of students as possible. A total of 75 students participated in the focus groups, and each focus group meeting lasted for an hour. The focus group interview questions appear in Appendix C.6

**Qualitative Analysis of Student Comments**

A total of 5,877 respondents (21.5%) answered an open-ended question in the online survey. They expressed opinions on their use of and skill with IT, the state of their institution’s IT support services, their perceptions of technology use in their courses, and their experiences with SNSs. These comments, focusing on selected topic areas, were analyzed using the content analysis tool SPSS Text Analysis for Surveys. This provided additional insight into the substance of the qualitative data.7 These findings have been incorporated into the text of the study.

**Longitudinal Analysis**

The data from the 2006, 2007, and 2008 surveys were compared where possible to identify any significant changes during the past three years. Where questions were consistent over the past three years, ECAR was able to use comparative data from the 44 institutions that participated in all three studies. Where survey questions were consistent over only the past two years, ECAR was able to use comparative data from the 66 institutions that participated in both the 2007 and 2008 studies. However, it is important to note that this study does not attempt to follow the same students over time.

**Analysis and Reporting Conventions**

The following conventions are observed in analyzing and reporting data results:

- Some tables and figures presented in this study include fewer than 27,317 respondents. They were adjusted for missing information.
- Percentages in some charts and tables may not add up to exactly 100%, due to rounding.
- The Likert scales used in the online surveys are footnoted in the tables and figures showing results for the survey questions.
- Associations between survey questions (variables) that are both statistically significant and meaningful are reported in the text and/or supporting figures and tables. Note that a statistically significant relationship between two variables doesn’t necessarily indicate a causal relationship.

**Research Team**

Judith Borreson Caruso and Gail Salaway are the principal investigators. Mark Nelson’s contribution to the study is a content analysis of student comments to an open-ended survey question. Nicole B. Ellison of Michigan State University’s Department of Telecommunications, Information Studies, and Media contributed the Introduction, Chapter 2.

**Judith Borreson Caruso**

Judith Borreson Caruso is Director of Policy and Planning at the University of Wisconsin–Madison and has been an ECAR Research Fellow...
since July 2002. She has been in higher education IT roles for almost 30 years in the areas of application development, data management, policy, and security. Caruso is active in several IT professional organizations, including EDUCAUSE. She has served on the EDUCAUSE Current Issues and EDUCAUSE Quarterly editorial committees. Currently, she serves on the executive committee of the University of Wisconsin System IT Management Council. While with ECAR, she participated in the enterprise resource planning (ERP), IT security, and student studies.

Nicole B. Ellison
Nicole B. Ellison is an Assistant Professor in the Department of Telecommunications, Information Studies, and Media at Michigan State University. She studies the social implications of new information and communication technologies such as SNSs, online dating sites, and blogs. Recent projects include an investigation of the relationship between Facebook use and social capital among college students and a special issue of the Journal of Computer-Mediated Communication on SNSs, which she coedited with danah boyd. Previously, she has examined misrepresentation in online dating profiles, student perceptions of educational blogging, and technology use by telecommuters, the latter explored in her 2004 book Telework and Social Change. Ellison received her PhD from the Annenberg School for Communication at the University of Southern California in 1999.

Mark R. Nelson
Mark R. Nelson earned his PhD in information science from the University at Albany, State University of New York, in 1998. He is the Digital Content Specialist at the National Association of College Stores (NACS). Recently, he was appointed Vice President for Strategy and Development for NACS Media Solutions. Formerly, Nelson was Assistant Professor in Management Information Systems and Information Technology at the Lally School of Management and Technology at Rensselaer Polytechnic Institute. Nelson has served as an ECAR Fellow since summer 2003. In this capacity, he has contributed to major research studies including IT leadership, IT in medical school research, and the annual student studies. He has also authored several research bulletins. He is a specialist in qualitative research methods.

Gail Salaway
Gail Salaway earned her PhD in management of information systems from the University of California, Los Angeles, in 1984. She is a former Director of Administrative Computing and Communications at UCLA, where she was responsible for campus-wide administrative information systems and telecommunications services, and management of academic and general computing initiatives. As an ECAR Fellow, she has been principal investigator of research studies on IT leadership, IT alignment, IT networking, and undergraduates and IT.

Participating Institutions
Participation in the study was voluntary, and each institution obtained approvals from its institutional executives and its institutional review board (IRB). Therefore, the institutions participating in the study do not represent a statistical representation of U.S. higher educational diversity as a whole (see Table 3-1). Specifically, they are overwhelmingly four-year institutions (90 out of 98 U.S. institutions participating). Responses are further biased toward doctoral institutions (46.5%), larger institutions (66.4% enroll more than 8,000 students), and public institutions (74.8%). Findings are therefore considered to be instructive or indicative rather than conclusive of student experiences at different types of institutions. Even considering these biases, the 98 U.S. institutions that participated in this study do reflect a mix of the different higher education institution types in the United States, in terms of Carnegie class, size of institution, private versus public status, sources of funding,
and levels of technology emphasis. In this 2008 study, there was more participation from AA institutions—eight institutions accounting for 12.2% of student respondents, compared with four AA institutions accounting for 6.6% of student respondents in the 2007 study.

**Respondent Characteristics**

Invitations to participate in the survey were sent by e-mail to more than 250,000 students—seniors and freshmen at 90 U.S. four-year institutions and to general students at 8 community colleges (see Appendix D). A profile of responding students appears in Table 3-2. Although four-year institutions invited only seniors and freshmen, some students responded “other” when asked “What is your class standing?” These students’ understanding of their own standing differed from that of the official institutional record.

Freshmen from four-year institutions make up 32.9% of the respondents, seniors from four-year institutions make up 42.8% of the respondents, and community college students make up 12.2%. Female students make up 63.2% of the respondents, despite the strategy of oversampling male students in the population. As in past years, student respondents are weighted toward so-called traditional students. The majority of respondents are under 25 years old (78.8%) and go to school full time (84.0%). Freshmen most often live on campus (79.0%), while seniors (78.4%) and community college students (97.1%) most often live off campus. The grade point averages for our respondents show 75.7% having a B or better grade point average.

The overall student response rate in the 2008 study was 11.9%. A significant variation by institution was observed, and the response rate may be affected by a number of factors.

---

<table>
<thead>
<tr>
<th>Table 3-1. Profile of Participating Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carnegie Class</strong></td>
</tr>
<tr>
<td>Number of Institutions (N = 98)</td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
<tr>
<td>DR</td>
</tr>
<tr>
<td>MA</td>
</tr>
<tr>
<td>BA</td>
</tr>
<tr>
<td>AA</td>
</tr>
<tr>
<td>MED</td>
</tr>
<tr>
<td>ENGR</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>Student FTE Enrollment</strong></td>
</tr>
<tr>
<td>1–2,000</td>
</tr>
<tr>
<td>2,001–4,000</td>
</tr>
<tr>
<td>4,001–8,000</td>
</tr>
<tr>
<td>8,001–15,000</td>
</tr>
<tr>
<td>15,001–25,000</td>
</tr>
<tr>
<td>More than 25,000</td>
</tr>
<tr>
<td><strong>Control</strong></td>
</tr>
<tr>
<td>Private</td>
</tr>
<tr>
<td>Public</td>
</tr>
</tbody>
</table>
First, there continues to be a proliferation of spam, and since many spam e-mails can contain computer viruses and other forms of malware, it is not unlikely that students are increasingly cautious about responding to the e-mail invitation. Second, students continue to receive numerous e-mails throughout the year asking them to take a survey and win a prize.

Respondents identified their majors (see Table 3-3). Note that the total number of responses is larger than the overall number of respondents (N = 27,317) due to many respondents’ reporting more than one major (14.8%). Because so many respondents are freshmen, it is not surprising to find that 7.0% are undecided. Also, more students selected “other” than any other major category. This is likely due to the proliferation of unique majors and combination majors that don’t seem to fit the listed major categories.

Table 3-2. Profile of Student Respondents

<table>
<thead>
<tr>
<th></th>
<th>Four-Year Institutions</th>
<th></th>
<th>Two-Year Institutions</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seniors (N = 11,629)</td>
<td>Freshmen (N = 8,924)</td>
<td>Other (N = 3,272)</td>
<td>All Students (N = 3,317)</td>
<td>All Students (N = 27,317)*</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>37.7%</td>
<td>37.5%</td>
<td>39.7%</td>
<td>29.1%</td>
<td>36.8%</td>
</tr>
<tr>
<td>Female</td>
<td>62.3%</td>
<td>62.5%</td>
<td>60.3%</td>
<td>70.9%</td>
<td>63.2%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–19</td>
<td>0.4%</td>
<td>91.8%</td>
<td>12.5%</td>
<td>19.5%</td>
<td>34.3%</td>
</tr>
<tr>
<td>20–24</td>
<td>75.0%</td>
<td>4.4%</td>
<td>60.3%</td>
<td>29.6%</td>
<td>44.5%</td>
</tr>
<tr>
<td>25–29</td>
<td>10.1%</td>
<td>1.4%</td>
<td>8.6%</td>
<td>14.4%</td>
<td>7.6%</td>
</tr>
<tr>
<td>30–39</td>
<td>7.2%</td>
<td>1.1%</td>
<td>8.7%</td>
<td>17.8%</td>
<td>6.6%</td>
</tr>
<tr>
<td>40–49</td>
<td>4.9%</td>
<td>0.9%</td>
<td>6.5%</td>
<td>13.4%</td>
<td>4.8%</td>
</tr>
<tr>
<td>50 and older</td>
<td>2.4%</td>
<td>0.4%</td>
<td>3.3%</td>
<td>5.3%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>21.6%</td>
<td>79.0%</td>
<td>33.7%</td>
<td>2.9%</td>
<td>39.7%</td>
</tr>
<tr>
<td>Off campus</td>
<td>78.4%</td>
<td>21.0%</td>
<td>66.3%</td>
<td>97.1%</td>
<td>60.3%</td>
</tr>
<tr>
<td>Full/Part-Time Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time</td>
<td>85.5%</td>
<td>96.5%</td>
<td>81.2%</td>
<td>48.0%</td>
<td>84.0%</td>
</tr>
<tr>
<td>Part time</td>
<td>14.5%</td>
<td>3.5%</td>
<td>18.8%</td>
<td>52.0%</td>
<td>16.0%</td>
</tr>
<tr>
<td>GPA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>19.3%</td>
<td>17.0%</td>
<td>23.4%</td>
<td>21.7%</td>
<td>19.3%</td>
</tr>
<tr>
<td>A-</td>
<td>22.2%</td>
<td>18.8%</td>
<td>20.6%</td>
<td>12.8%</td>
<td>19.7%</td>
</tr>
<tr>
<td>B+</td>
<td>21.7%</td>
<td>20.0%</td>
<td>21.5%</td>
<td>19.3%</td>
<td>20.9%</td>
</tr>
<tr>
<td>B</td>
<td>16.2%</td>
<td>16.3%</td>
<td>14.0%</td>
<td>15.0%</td>
<td>15.8%</td>
</tr>
<tr>
<td>B-</td>
<td>11.2%</td>
<td>11.4%</td>
<td>7.6%</td>
<td>11.1%</td>
<td>10.8%</td>
</tr>
<tr>
<td>C+</td>
<td>4.7%</td>
<td>4.4%</td>
<td>4.0%</td>
<td>4.1%</td>
<td>4.5%</td>
</tr>
<tr>
<td>C</td>
<td>3.1%</td>
<td>4.6%</td>
<td>3.8%</td>
<td>4.7%</td>
<td>3.9%</td>
</tr>
<tr>
<td>C- or lower</td>
<td>0.3%</td>
<td>1.6%</td>
<td>0.9%</td>
<td>0.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>1.2%</td>
<td>5.8%</td>
<td>4.2%</td>
<td>10.6%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

*There were 175 students who did not answer the question about their class standing.
Table 3-3. Student Respondents’ Majors

<table>
<thead>
<tr>
<th>Major</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>5,853</td>
<td>21.4%</td>
</tr>
<tr>
<td>Life/biological sciences, including agriculture and health sciences</td>
<td>4,966</td>
<td>18.2%</td>
</tr>
<tr>
<td>Business</td>
<td>4,363</td>
<td>16.0%</td>
</tr>
<tr>
<td>Social sciences</td>
<td>4,085</td>
<td>15.0%</td>
</tr>
<tr>
<td>Education, including physical education</td>
<td>2,745</td>
<td>10.0%</td>
</tr>
<tr>
<td>Engineering</td>
<td>2,524</td>
<td>9.2%</td>
</tr>
<tr>
<td>Humanities</td>
<td>2,210</td>
<td>8.1%</td>
</tr>
<tr>
<td>Fine arts</td>
<td>1,911</td>
<td>7.0%</td>
</tr>
<tr>
<td>Undecided</td>
<td>1,902</td>
<td>7.0%</td>
</tr>
<tr>
<td>Physical sciences, including math</td>
<td>1,324</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

Endnotes

1. ECAR is indebted to Robert Albrecht (ECAR), Carole Barone (then with EDUCAUSE), Darwin Handel (University of Minnesota), Diana Oblinger (then with ECAR), Robert Kvavik (then with ECAR), and others who participated in creating the ECAR study.

2. Previous years’ ECAR studies on undergraduate use of IT are publicly available on the ECAR website, http://www.educause.edu/ecar.

3. There is a single English-language version of the survey that is designed to work internationally.

4. Some questions were deleted because they did not work well or were no longer needed; other questions were changed to make them clearer; new questions were added to address issues identified as important in 2007; some questions were reordered or their format changed to tables in order to streamline and simplify the survey; and questions were added about student use of social networking sites.

5. In addition to potential sampling errors, there are other potential sources of error that are not sample related, such as the wording of the survey questions (their meaning may not be clear) and, most notably, nonrepresentative responses (a large percentage of the students declined to take this survey). Because the response rates in this study were lower than hoped for at a number of schools, one cannot be certain of how representative the respondents are of their respective institutions or of this population in general. Therefore, caution should be exercised in assuming that the findings generalize beyond the sampled students.

6. Staff from participating institutions used a variety of methods to recruit students—posting advertisements in various campus locations, making announcements in large-enrollment classes, and e-mailing students. Food and beverages were provided as incentives to attend. Students who work in general-access undergraduate student computing laboratories or for student technology help desks were also included in the focus groups. Students were advised of IRB regulations that govern the research and their rights and of the responsibility of the investigators to protect their rights. Notes were taken. None of the comments made by students and cited in this study identify any individual student. In some instances, we corrected their English but made no change in meaning.

7. The qualitative analysis for this study used a simple, iterative codification analysis process. SPSS Text Analysis for Surveys (v2.0) software was used as follows: (1) terms and concepts were identified by frequency, (2) the terms were evaluated by “type,” such as whether a term or combination of terms had a positive or negative tone, (3) terms and term pairings were reviewed for accuracy and greater contextual understanding than provided by the software, and (4) as needed, responses were force-coded into additional categories, reclassified as synonyms, and/or new study-specific terms were added to the software dictionary. In addition, all responses were reviewed manually for additional concepts, topics, or patterns that need to be coded within the data. This process required multiple reviews of the data, as is common in grounded theory and similar approaches to qualitative data analysis.

8. Each institution required approvals from institutional executives and the IRB to participate in the study. The approval processes, although navigated by an institutional contact, varied considerably in difficulty from institution to institution. Often, the information required for approval was different from one institution to the next. Although the investigators made every attempt to provide all information required at the start of the study solicitation, additional details were added throughout the approval process to provide what each institution required. The information collected is confidential. No data from the quantitative survey are presented that would make it possible to identify a particular respondent. The data files used for analysis have been purged of any information that would have similar consequences. The IRB applications, application dates, and approval dates are available from ECAR.

9. To encourage a larger response from the students, ECAR offered 38 $50 gift certificates and 10 $100 gift certificates to be awarded to students, using a lottery.

10. Several participating institutions did not provide enrollment and sample information, so these data were not included in the calculation for overall response rate.
4
Ownership of, Use of, and Skill with IT

We are a tech-savvy generation. But technology is moving too fast—even for us.
—An undergraduate student

Key Findings
- Laptop ownership increased again this year. Overall, 80.5% of respondents own them, and of students living on campus, 90.8% own them. Freshmen arrive at college with laptops—71.1% own a laptop less than one year old.
- Two-thirds of respondents own an Internet-capable cell phone, but only 30.8% actually access the Internet from a cell phone or PDA. Cost is cited as the primary reason.
- Respondents spend an average of 19.6 hours per week actively doing online activities for school, work, and recreation. Engineering students report the most time online. Community college students spend less time online than their four-year counterparts.
- Almost all students (more than 90%) use the college or university library website or use presentation software. Most use spreadsheets (85.9%), course management systems (82.3%), and graphics software (73.9%).
- Males download web-based music or video, play online multiuser games, and use video- and audio-creation software more often than females. Younger students use communication tools of text messaging, instant messaging (IM), and social networking sites (SNSs) more often than older students.
- Overall, respondents report that they are between “fairly skilled” and “very skilled” in the core technology and information literacy skills increasingly important to the academic experience. Seniors report stronger skills than freshmen for using spreadsheets and using the college or university website.
- Half of respondents (51.4%) say they are mainstream adopters of technology, 35.4% say they are early adopters, and 13.2% say they are late adopters. Early adopters are more often male, report stronger technology skills, and spend more time online.

When ECAR launched its first study of undergraduates and IT in 2004,1 desktops, instead of laptops, were the most popular computer platform (63%), one in five students still used dial-up Internet services (19%), and cell phones were not yet ubiquitous, owned by only 82% of respondents. Web 2.0 and its associated applications were too recent to even be included in the survey. Now, just four years later, that 2004 technology world—dominated by e-mail, word processing, a relatively unsocial Internet, and simple cell phones—is truly the dark ages.
for today’s undergraduates. In fact, the 2008 survey no longer even asks about e-mail, word processing, or simple cell phone ownership.

It comes as no surprise that the 2008 study now finds most undergraduates highly active, mobile, and versatile in the many technologies they use. They especially take full advantage of IT that supports creative communication and flexible community—integrating IM, text messages, blogs, and SNSs to chat, share all kinds of digital photos and materials, and plan, convene, and participate in every kind of group imaginable. Beloit College’s “Mindset List” for students graduating in 2010 and 2011 provides a sense of this generation’s culture and their relationship to technology:2

- They are wireless, yet always connected.
- “Google” has always been a verb.
- Being tech-savvy has always been inversely proportional to age.
- The World Wide Web has been an online tool since they were born.
- Music has always been “unplugged.”
- Text messaging is their e-mail.

This chapter begins our 2008 update, presenting many useful findings from survey data about the undergraduate experience with both mainstream and selected emerging technologies. It includes

- the current profile of student ownership of laptops, desktops, and web-enabled cell phones,
- what computer and Internet activities students currently engage in,
- how students assess their IT skills and information literacy, and
- whether students think of themselves as early, mainstream, or late adopters of technology, and how these groups differ.

**Technology Ownership**

Past ECAR surveys have asked students what technologies they owned, including music/video devices, game devices, PDAs, and cell phones. Now, as mobile devices rapidly converge in the functionality and services they offer, the actual physical devices students own becomes less meaningful. This year, the survey focused on what actual activities students engage in using technology, regardless of the physical delivery system. The survey did, however, retain questions about personal computer ownership, along with a question about ownership of Internet-capable cell phones.

**Personal Computers**

Almost all respondents (98.5%) own a computer (see Figure 4-1). Laptops are by far the most popular choice (80.5%), although more than half of respondents (53.8%) still own desktops. Overall, new computers are largely laptop computers—more than one-third (36.8 percent) of laptops are less than one year old, whereas only 6.8% of desktops are less than one year old. Again this year, laptops gained relative to desktops. Among respondents at the 44 institutions participating in each of the past three studies, laptop ownership increased from 65.9% in 2006 to 82.2% in 2008 (see Table 4-1). The trend toward laptops vis-à-vis desktops is expected to continue, but more interesting will be watching what some technologists are predicting—that converged handhelds such as the iPhone will at some point eliminate the need to carry around multiple devices, including laptops.

One-third of respondents (35.5%) own both a laptop and a desktop; for some the laptop is newest, for others the desktop is. Since newer computers generally have more capabilities and better performance and are more robust, ECAR looked at the profile of students’ newest computer. In fact, most respondents (68.9%) do own at least one fairly new desktop or laptop computer (two years old or less). However, about one in five students (16.8%) does not own any computer less than four years old and therefore is more likely to encounter maintenance and/or performance problems.
Gender differences in computer ownership are minor. Males own desktop computers at a slightly higher rate (60.0%) than females (50.1%), but there is no significant gender difference in ownership of laptops, which are increasingly the dominant platform. Most freshmen at four-year institutions have new laptops when they enter college, with 71.1% owning one less than a year old and 80.4% owning one less than two years old (see Figure 4-2). In addition, those students who live on campus, regardless of age or class standing, are more likely to own laptops. A full 90.8% of on-campus students have them. This makes sense because institutions and nearby local businesses both increase the reach of wireless networks.

Table 4-1. Change in Computer Ownership from 2006 to 2008 (44 Institutions)*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal desktop computer</td>
<td>71.0%</td>
<td>59.7%</td>
<td>51.2%</td>
<td>-19.8%</td>
<td>-27.9%</td>
</tr>
<tr>
<td>Personal laptop computer</td>
<td>65.9%</td>
<td>73.5%</td>
<td>82.2%</td>
<td>16.3%</td>
<td>24.7%</td>
</tr>
</tbody>
</table>

*Data are based on student responses from the 44 institutions that participated in each of the 2006, 2007, and 2008 studies. While institutions remain the same, the actual students responding are different each year.

**Absolute change is the difference between the 2006 and 2008 percentages. Relative change is the absolute change as a percentage of the 2006 percentage.
Respondents from community colleges, however, more often rely on older machines and are less likely to own laptops, suggesting that they may need greater use of computer labs and other on-campus IT resources. Only 32.2% own a laptop less than two years old, and two-fifths (40.4%) do not own a laptop at all. Instead, they are more likely to own desktops (77.0%) than students at four-year institutions (50.5%). This general pattern for community colleges held true for the 2006 and 2007 data as well. Finally, 1.5% of respondents (416) report that they still do not own any kind of computer. These respondents are fairly evenly distributed across the demographic and institutional characteristics ECAR asked about.

Internet-Capable Cell Phones

Colleges and universities are tracking the maturation and price points for converged handheld mobile devices as a platform for providing IT services to students. Medical schools are leading the way, aligning student education with current medical practices that make extensive use of handheld technology. Other schools are also experimenting with web-enabled cell phone applications, grappling with the technology challenges of migrating applications to small devices and extending the campus technology infrastructure as necessary—all in an environment where vendor technology platforms vary significantly and technology is evolving quickly.
Campus services accessed by handheld mobile devices require that students, as well as universities, be ready. Students not only must own Internet-capable mobile devices but also must activate and pay for using the Internet feature. With respect to ownership, it appears that many respondents are switching out simple cell phones for web-enabled cell phones, possibly as existing contracts expire. Although the 2007 data showed that 86.1% of respondents owned a simple cell phone that did not have web access, the current 2008 data show that 66.1% of respondents own a cell phone that does have web access, and another 5.3% plan to own one within the next 12 months (see Figure 4-3). Further, respondents generally have clear plans about whether they will or will not be purchasing a web-enabled phone, with only 3.9% saying they don’t know.

Even though two-thirds of students own web-enabled phones, activating and using this capability may or may not follow. Table 4-2 shows the distribution of answers to the survey question “How often do you access the Internet from a cell phone or PDA for work, school, or recreation?” About one-third of respondents (30.8%) say that they do, and 17.5% are doing so at least weekly. This suggests that students are beginning to integrate Internet access from mobile devices into their lives. Most of this access is likely from cell phones, since PDAs are a declining platform. Interestingly, this trend was consistent across the demographics of gender, age, class standing, and Carnegie class.

Focus group students had a similar profile. Among the 75 students who participated, 18 of them (24%) considered themselves users of Internet applications with their cell phones. One longtime user said, “I use it for e-mail, web browsing, and calendaring to keep track of projects. I’ve done this for two years.” However, many of these active users said they focused on just a few applications such as music, e-mail, text, or maps. Market research expects rapid growth of Internet use over smartphones. A February 2007 survey conducted by Harris Interactive of adult cell phone owners contrasted relatively high SMS (short message service) text messaging use (36%) with much less common Internet-based activities such as checking e-mail (9%), finding information using a search engine (7%), and accessing the Internet for reasons other than search and download (8%). Although these numbers are low, many respondents also said they planned to make much greater use of the Internet from cell phones over the next three years.

Students gave clear reasons for not using the Internet from cell phones: The screen is too little, the response is too slow, and, especially, it is too expensive. One student explained, “Accessing the Internet with your cell phone is not worth it. It’s dumb to use something so slow. It’s costing me and the screen hasn’t popped up yet! While I’m talking

![Figure 4-3. Internet-Capable Cell Phone Ownership (N = 27,200)](image-url)
on the phone, the Internet is still on. That's costing me. When you get the bill for $100, you realize that it's not worth it.” Recognizing the cost barrier, Apple dropped the price of its 8GB iPhone from $599 to $399 in September 2007. A marketing research firm, SurveyU, polled 1,000 students and noted a dramatic increase in demand for the iPhone after the price reduction. Now available, the second-generation iPhone 3G, promoted as a web device, is cheaper and is addressing some of these student concerns. Similar competitive devices are also coming to market.

**Hours Online and Internet Access Method**

Respondents vary widely in how much time they spend each week doing online activities for school, work, and recreation (see Figure 4-4). About one-third (36.2%) spend 10 hours or less online each week, and another third (32.9%) spend 11 to 20 hours per week online. The overall mean is 19.6 hours per week, and the median is 15 hours per week. At the high end of time spent online, 7.4% of respondents spend 40 hours per week or more on the Internet, about double the mean response and in the range of what is typically considered a full-time job. A spring 2007 survey by Youth Trends reported similar total time spent online and also looked at time spent online for academic activities. They found that full-time students at four-year institutions spent 19.2 hours per week online, up one hour from their previous year’s findings. Further, females, on average, spent 12.4 hours per week on entertainment and 7.3 hours on academic activities. For males, the average entertainment time was 12.1 hours per week and time spent on academic activities was 6.6 hours per week.

Differences based on age, gender, and senior versus freshman standing are minor overall. However, Carnegie classification does seem to matter. Respondents at doctoral institutions show the most hours online (mean of 21.0 hours per week), followed closely by master’s and bachelor’s institution respondents (means of 19.2 and 19.1 hours per week, respectively). Associate’s institution respondents report spending by far the fewest hours doing online activities (mean of 14.8 hours per week), with well more than half using the Internet 10 hours or less per week. A number of factors may account for this pattern, such as doctoral institutions having more engineering students and associate’s institutions having more nontraditional students, whose greater family and job responsibilities may translate into less Internet use.

Time spent online also varies with student major (see Table 4-3). Engineering majors show the most time and life/biological sciences and education majors show the least time. Focus group students were sensitive to the impact of their major on time spent online. One student said, “I am both a nursing major and a psychology major. For my nursing work, I am on the computer all the time. This

### Table 4-2. Use of the Internet from a Cell Phone or PDA (N = 27,163)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>69.2%</td>
</tr>
<tr>
<td>Once per year</td>
<td>3.4%</td>
</tr>
<tr>
<td>Once per quarter or semester</td>
<td>4.4%</td>
</tr>
<tr>
<td>Monthly</td>
<td>5.5%</td>
</tr>
<tr>
<td>Weekly</td>
<td>3.8%</td>
</tr>
<tr>
<td>Several times per week</td>
<td>3.5%</td>
</tr>
<tr>
<td>Daily</td>
<td>10.2%</td>
</tr>
</tbody>
</table>
is not the case with my psychology major.” Computer science, engineering, and business students said they are online more than their social science friends. However, considering the wide variation in major requirements, the actual gap between the lowest- and highest-use majors does not seem large—just 7 hours per week, or about an hour a day.

Now, in 2008, almost all respondents use high-speed connections for their time online. In previous years, although most respondents reported use of high-speed Internet access (either wired or wireless broadband provided by the campus or by the commercial sector), a significant number of respondents reported that they were still using dial-up services (11.9% in 2005, 9.8% in 2006, and 7.1% in 2007). This year, the survey question was streamlined to simply ask whether Internet access was via “high-speed (wired or wireless)” or “dial-up services.” Virtually all respondents now say their primary method of connection is high-speed Internet service (98.1%); only 527 respondents (1.9%) reported using dial-up services.
Computer and Online Activities

What are students actually doing on their computers and on the Internet all these hours? Table 4-4 presents a profile of selected student IT activities—basic core applications, communications technologies, and some new or emerging technologies—and associated demographic factors. Last year’s study found that the use of e-mail and word processing had become ubiquitous, so the 2008 survey did not again ask about these activities. Technology basics for course work—college and university library websites, course management systems (CMSs), presentation software, and spreadsheets—are very widely used. Fully 82.9% of respondents use both spreadsheets and presentation software, and only 5% do not use either. Even the more complex software tools needed to create audio or video are used by about one in three respondents, with most of them doing so at least once a quarter or semester.

Respondents make frequent use of multiple modes of electronic communication. The ECAR 2007 data showed that use of e-mail was universal, and the 2008 data show that about three-fourths of respondents use text messaging, SNSs, and IM. Fully 61.1% use all three of these modes of communication. Some colleges and universities are now taking advantage of students’ avid use of text messaging, especially for emergency notifications. Our focus group participants were divided on this issue, with some liking the idea and others saying that they do not want to receive text messages from their institutions. Cornell University finds a similar interest pattern; they established an “opt-in” program for SMS text messaging notifications of campus emergencies, and as of February 2008, 56% of their students had opted to receive these messages.

Internet users increasingly contribute to the online commons—by creating websites, blogging, and posting photos, artwork, videos, and other digital materials, to name some of the most popular ways. ECAR looked at this trend among undergraduates to learn the extent of student participation in Internet activities that go beyond traditional “surfing.” Specifically, the survey asked whether students contribute content to the web via three common venues: wikis (such as Wikipedia, or a course wiki), blogs, and photo or video websites (such as Flickr or YouTube). Nearly one in five respondents (18.4%) reported adding content to all three of these types of websites, and 22.5% add content to at least one. At the other end of the scale, almost two in five students (38.7%) say they do not add content to any of these three types of websites.

<table>
<thead>
<tr>
<th>Major</th>
<th>N</th>
<th>Mean Hours per Week</th>
<th>Median Hours per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>2,511</td>
<td>24.8</td>
<td>20</td>
</tr>
<tr>
<td>Physical sciences, including math</td>
<td>1,313</td>
<td>21.2</td>
<td>15</td>
</tr>
<tr>
<td>Humanities</td>
<td>2,206</td>
<td>21.0</td>
<td>17</td>
</tr>
<tr>
<td>Social sciences</td>
<td>4,072</td>
<td>20.2</td>
<td>16</td>
</tr>
<tr>
<td>Business</td>
<td>4,343</td>
<td>19.9</td>
<td>15</td>
</tr>
<tr>
<td>Fine arts</td>
<td>1,901</td>
<td>19.9</td>
<td>15</td>
</tr>
<tr>
<td>Life/biological sciences, including agriculture and health sciences</td>
<td>4,948</td>
<td>17.9</td>
<td>14</td>
</tr>
<tr>
<td>Education, including physical education</td>
<td>2,735</td>
<td>17.6</td>
<td>14</td>
</tr>
</tbody>
</table>
### Table 4-4. Student Computer and Internet Activities

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

*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.
The most popular of these three venues are photo or video websites, with 46.6% of respondents contributing material, most often on a monthly basis. When talking about video, students in focus groups frequently mentioned YouTube. A male senior majoring in television production described himself as “a YouTube junkie. I put stuff out there and look at stuff out there. I watch everything: documentaries, music videos, someone’s how-to video, everything.” Another male student said, “I’m on YouTube all day long. I watch home videos and television shows. You name it, I watch it.”

Contributing to blogs also has a strong showing; about one-third (34.1%) of respondents say they do so. A Pew Internet & American Life Project study asked slightly different questions and found that 33% of college students keep and regularly post to their own blog and that 54% read blogs. Our student respondents described diverse uses for blogs. A senior history major noted, “I started my personal journal blog when I was abroad. My family and friends could keep track of what I was doing through my blog. Now my blog is my ramblings. I get to show the world how witty I am.” Another student wrote a comment about a blog used for student government activities: “Our student government blog is updated by someone every day. This makes it interesting and useful. We keep track of what is happening through the blog. I also have a personal blog I use to showcase my poetry.”

The survey also included questions about two other highly interactive technologies: online multiuser computer games and online virtual worlds. Almost one-third (29.4%) of students are engaged in online multiuser computer games, and 8% of respondents say they play these games several times per week or more. Comments from students indicated a few themes. One was the lack of access to gaming due to institutional bandwidth limitations or other controls. Typical of these comments were requests for their institutions to “administer a persistent online game environment” and “stop blocking online gaming.” A handful of comments mentioned online games in the learning context, such as, “I especially like it when courses have interactive games that let you practice skills or review for tests.” Finally, students in the focus groups expressed concern about time spent on games, with comments such as, “I am addicted to games at games.com, primarily Scrabble and Monopoly. This is 24 x 7. I’ll be up until 3:00 a.m. trying to beat a game” and “I have a friend who skipped classes 10 days in a row because he was playing a game.”

There is much less engagement in online virtual worlds such as Second Life (used by only 8.8% of respondents). However, given the newness of this technology, it is notable that about 4.1% of students already participate monthly or more often.

Where Gender Makes a Difference

Despite the declining significance of gender in such areas as computer ownership and time spent on the Internet, gender differences persist in the use of some emerging technologies, especially audio and video creation and multiuser gaming. Figure 4-5 shows that almost twice as many males as females use software to create audio or video. Smaller gender differences exist for use of podcasts and webcasts. And, as found in previous years’ studies, males dominate computer gaming. In 2008, more than twice as many males (44.0%) as females (20.9%) report playing online multiuser computer games. Further, 21.1% of male respondents say they play online multiuser computer games at least once a week, and only 7.1% of females do so.

Where Age Makes a Difference

Today, traditional-age undergraduates are all members of the Net Generation (millennial)—born between 1982 and 1991—and have a generally accepted set of defining characteristics. One compendium of essays, Educating
the Net Generation, looks at this generation from the various perspectives that are relevant to college experience. The authors highlight the Net Generation’s social nature, their practice of creating and participating in a wide range of flexible communities, and their use of technology to facilitate this socialization and connection with others—IM, text messaging, gaming, blogging, and social networking.

The ECAR 2008 data reveal these characteristics, showing that this age group is the most active in using the communication and collaboration technologies of IM, text messaging, and SNSs (see Figure 4–6). Even within the Net Generation, younger respondents are more actively involved. Compared with respondents 20 to 24 years old, about 10% more of those aged 18 and 19 use IM and SNSs several times per week or more often. These communication technologies are extremely pervasive among the youngest students.

SNSs continue to gain in popularity from previous years and are now used by fully 85.2% of respondents. Chapter 6 presents a wealth of information and interesting findings about how students are currently engaged in SNSs.

**Student Technology Skills**

Strong IT skills are essential for success in the 21st century—for working within an increasingly (electronically) collaborative world, using computers and their growing numbers of applications, navigating electronic media and information effectively, and continually adapting to changing technologies. In response, a number of organizations and initiatives have emerged to help engage American education in understanding and improving the IT skills of students.

This ECAR study, as well, looks at student skills (on the basis of self-assessment) for a set of computer technologies and information literacy practices important to the undergraduate experience (and beyond). ECAR also recognizes that academic research finds that self-assessment is not a perfect proxy for actual skills and, further, that males often rate their skills higher than females. Nevertheless, the ECAR skill data about IT can provide insight into students’ perceptions about their IT skills and where they are most and least comfortable with these skills.
Technology Skills Self-Assessment

Respondents have confidence in their skills with presentation software, spreadsheets, CMSs, and college and university library websites, generally rating themselves between “fairly skilled” and “very skilled” (see Table 4-5). For the top-rated skill—presentation software—more than half of respondents (55.8%) say they are “very skilled” or an “expert,” and another third (36.6%) say they are “fairly skilled.” However, skill ratings for graphics software, used by a large number of respondents (73.9%), are lower, somewhat below “fairly skilled.”

Table 4-5 also notes demographic factors associated with skills. The only significant gender difference, even considering the tendency of males to rate themselves somewhat higher than females, is for computer maintenance skills. Although 46.8% of males say they are “very skilled” or “expert,” only 17.6% of females do so. Perhaps more interesting is that males and females report similar skill ratings for the core technologies used in courses—CMSs, spreadsheets, presentation software, and the college/university library website.

As found in previous years’ studies, students are not comfortable with their computer maintenance skills. Slightly more than one in four respondents (28.5%) rate themselves as “very skilled” or “expert.” At the other end of the scale, more than one in three respondents (36.9%) rate themselves as “not very skilled” or “not at all skilled.” Invariably, when asked about their skills with computer maintenance, focus group attendees groan. A political science student observed, “For computer maintenance, I should have stronger skills. But I’m stronger than my parents!” This is an important gap in technology skill, considering that everyone who owns a computer needs to engage in computer maintenance to some degree.

There are also differences based on student majors. Fine arts majors report somewhat more skill with graphics software, and engineering and business majors report somewhat more skill with spreadsheets. In focus groups, students spoke about the impact of major on IT skills:
"Depending upon your major, you become proficient in different areas of technology. In biology, you use Excel and PowerPoint. In philosophy, you use Word and the course management systems. For my philosophy major, I never have library research. But I have for my biology major." (A junior biology and philosophy major)

"My life would be in shambles if I didn’t have Excel [for my economics major]." (A senior economics major)

"Arts students are strong in word processing. They write more essays. I’m strong in programming skills. Other majors don’t have the programming skills that I do." (A sophomore electrical engineering major)

For which technologies do skills increase over the college years? In fact, seniors reported stronger skills in two areas ECAR asked about. For using the institution’s library website, 54.9% of seniors rate themselves as “very skilled” or “expert,” compared with 37.0% of freshmen. For spreadsheets, 51.2% of seniors rate themselves as “very skilled” or “expert,” compared with 34.8% of freshmen. The lack of difference between seniors and freshmen for other IT skills—presentation and graphics software, CMSs, and computer maintenance—could be due to a number of factors. Freshmen may already bring CMS and presentation software skills from high school; the college experience may not affect some skills such as computer maintenance; freshmen may be more tech savvy in general; or freshmen may be less realistic about their IT skills and overrate them compared with seniors. It’s also interesting that the skill levels reported by community college students were generally comparable to those reported by all respondent populations (combined seniors and freshmen) at four-year schools.
This year again, students raised the issue of tech savviness increasing with each younger generation. Several students working on a university help desk discussed this phenomenon. One said, “Older students seem to have more technology problems. They often need to know things like how to format their paper and how to use the Internet, etc. Those who come to college right out of high school are more tech savvy.” Students also told us that middle and high school students often know more than they do. A freshman said, “The youngsters are catching up faster than we can go. My 11-year-old brother is teaching me about technology. He and his friends know how to bootleg a Nintendo DS!”

Finally, and as expected, the data show that respondents who rate their technology skills as being stronger have a higher technology use profile. They report that they

- engage more often in computer and Internet activities,
- spend more hours per week online, and
- identify themselves as earlier adopters of technology.

**Information Literacy Self-Assessment**

There are many definitions for information literacy, but in general it has been understood to be the ability to know when information is needed, how to find it, how to discern good information from bad, and how to use it appropriately. ECAR asked three survey questions about information literacy, derived from the Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education—now the most used framework for creating information literacy initiatives and programs. Results show that, overall, respondents consider themselves to be quite Internet savvy (see Table 4-5 and Figure 4-7). A full 79.5% give glowing reports of their ability to search the Internet effectively and efficiently. Almost half (46.4%) rate themselves “very skilled,” and another third (33.1%) rate themselves as “experts.” Although their confidence in their ability to evaluate the reliability and credibility of online information and their understanding of related ethical and legal issues are lower, overall ratings are still high. These positive perceptions about using the Internet to find information seem to transcend demographic differences. Response patterns are generally consistent across gender, age, student major, and Carnegie class.

In our student focus group sessions, students also claimed strong information-seeking skills and told us some of their strategies.

- “We can’t use Wikipedia as a source, but I use it as a stepping-stone to other sources such as dot-gov and dot-edu. I also use library resources.” (A junior history major)
- “Reliable sources are easy to find. I’ve never seen anyone get higher than a C grade on their paper when they use Wikipedia. It’s unreliable and can be changed all the time. I had a friend who made an intentional error (changing the army rank for an individual) and it was still there four or five weeks later.” (A sophomore political science major)
- “If a web page looks like it hasn’t been updated since the beginning of the Internet, it’s probably not OK. If it seems up to date, it seems more reliable.” (A sophomore computer science major)
- “They drill it into you since middle school not to copy and paste. They teach you about plagiarism.” (A sophomore)

Many educators believe that students’ perceptions about their net savviness are questionable. It is a do-it-yourself approach to information literacy; students rely on peers (and may perpetuate misinformation from peers) rather than on library staff or faculty; and students may have excessive confidence because they are unaware of the complexities involved or just because they have grown up with technology.
Student Technology Adoption Profile

In the 2006 study, ECAR first asked students about their “technology adoption” practice, using a standard scale developed by Everett Rogers. In fact, technology adoption turned out to be very meaningful. It is strongly associated with respondents’ use and experience with IT both generally and in the academic context. Therefore, in both 2007 and 2008, ECAR again asked students to describe how they adopt technology. Table 4-6 shows the overall distribution of responses—a bell-shaped curve—with half of respondents identifying themselves as mainstream adopters. Note that more than half of males (52.8%) claim that they are early adopters or innovators, whereas only one-fourth of females (25.2%) do so. These findings parallel those from the earlier ECAR studies.

Innovators and early adopters indicate much better computer skills (see Figure 4-8). For example, even though presentation software is a basic tool and used by 91.9% of respondents, only about one-third (33.4%) of late adopters/laggards think they are “very skilled” or “expert,” compared with more than two-thirds of innovators/early adopters. Especially striking are the skill ratings for computer maintenance, with more than half (54.8%) of innovators/early adopters reporting that they are “very skilled” or “expert,” compared with only 8.7% of late adopters/laggards. This same pattern of responses also occurs for the information literacy skills ECAR asked about (refer to Table 4-5).

This IT adoption factor is associated with other technologies as well, especially those that are new or more complex. For example, twice as many innovators/early adopters make frequent use of web-enabled
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Understanding these differences between early and late adopters may be useful in a number of ways. Watching innovator/early adopters’ use of new technologies provides early information in preparation for the mainstream adopters’ use that will follow. Second, variation in technology adoption implies variation in how students respond to their institutions’ applications and technologies, and it is an important factor to consider in deploying technology.

<table>
<thead>
<tr>
<th>Which best describes you?</th>
<th>Descriptor</th>
<th>Males</th>
<th>Females</th>
<th>All Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am skeptical of new technologies and use them only when I have to.</td>
<td>Laggard</td>
<td>3.0%</td>
<td>4.4%</td>
<td>3.9%</td>
</tr>
<tr>
<td>I am usually one of the last people I know to use new technologies.</td>
<td>Late adopter</td>
<td>6.3%</td>
<td>11.1%</td>
<td>9.3%</td>
</tr>
<tr>
<td>I usually use new technologies when most people I know do.</td>
<td>Mainstream adopter</td>
<td>37.9%</td>
<td>59.3%</td>
<td>51.4%</td>
</tr>
<tr>
<td>I like new technologies and use them before most people I know.</td>
<td>Early adopter</td>
<td>35.8%</td>
<td>20.1%</td>
<td>25.9%</td>
</tr>
<tr>
<td>I love new technologies and am among the first to experiment with and use them.</td>
<td>Innovator</td>
<td>17.0%</td>
<td>5.1%</td>
<td>9.5%</td>
</tr>
</tbody>
</table>

**Table 4-6. Respondent Technology Adoption, by Gender (N = 26,888)**

![Figure 4-8. Respondents Who Are Very Skilled or Expert with Technology, by Technology Adoption](chart)

**Figure 4-8. Respondents Who Are Very Skilled or Expert with Technology, by Technology Adoption**

cell phones or PDAs, online multiuser games, and online virtual worlds than do mainstream adopters (see Figure 4-9). Understanding these differences between early and late adopters may be useful in a number of ways. Watching innovator/early adopters’ use of new technologies provides early information in preparation for the mainstream adopters’ use that will follow. Second, variation in technology adoption implies variation in how students respond to their institutions’ applications and technologies, and it is an important factor to consider in deploying technology.
Concerns about Society and Technology

Again this year, student written responses raised issues about the negative impact of IT on society. Although these responses reflect the opinions of a small portion of respondents, they are consistent with previous years’ comments. There was some discussion of legal issues important to society, including intellectual rights problems and the use of IT to harm people. However, the primary concern was about the depersonalization of society and the overdependence on technology. Following are representative views from respondent comments:

- “We are a society so technically advanced that we are beginning to trade roles with technology. Instead of humans being in charge of technology, technology is running our lives...because we have given it permission to do so.”
- “I could get to the point where I don’t know how to talk with my friends in person, because I’m so used to communicating with them through the written medium. I know IT helps our society, but I’m afraid its hindering effects are being glossed over, and when the next generation grows up, we will see negative consequences.”
- “I think the creative flow and connection between people will be in danger if we go too cyber. I think it will overall damage our society if we begin to rely too much on machines and not on ourselves.”
- “By incorporating technology into every aspect of our lives, we are embracing greater social distance and decreasing the social development of many students. Relationships can hardly be called so when so many people never meet face-to-face. We need to learn technology’s possibilities, but not guide our lives by it.”

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use the Internet from a cell phone or PDA weekly or more often (N = 4,715)</td>
<td>25.9</td>
</tr>
<tr>
<td>Spend 30 hours or more per week actively doing online activities (N = 3,792)</td>
<td>21.6</td>
</tr>
<tr>
<td>Play online multiplayer computer games weekly or more often (N = 3,322)</td>
<td>19.7</td>
</tr>
<tr>
<td>Use online virtual worlds (Second Life, etc.) weekly or more often (N = 671)</td>
<td>3.9</td>
</tr>
</tbody>
</table>

*Innovator/early adopter
Mainstream adopter
Late adopter/laggard

Figure 4-9. Technology Adoption Profile
Endnotes

2. The list can be found at http://www.beloit.edu/mindset/index.php.
3. The number of respondents with Internet-capable handheld devices may be larger, because this question did not include ownership of Internet-capable devices other than cell phones—for example, PDAs, pocket PCs, or the iPod touch.
6. This question was slightly changed for 2008 to clarify that this was for time actively spent online. The 2007 question was “How many hours each week do you normally spend doing online activities for school, work, and recreation?” The overall mean was 18 hours per week. The 2008 question was “Approximately how many hours each week do you spend actively doing online Internet activities for school, work, and recreation?” The 2008 overall mean is 19.6 hours per week.
8. Demographic factors analyzed include gender, age, major, on-campus or off-campus residence, part-time or full-time enrollment status, and class standing (senior, freshman, or community college student).
13. According to the American Library Association’s “Presidential Committee on Information Literacy: Final Report” (1989), “To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” See http://www.ala.org/ala/acrl/acrlpubs/whitepapers/presidential.htm.
5
IT and the Academic Experience

You have to watch! If you see technology being substituted for teaching, run.
—An undergraduate physics student

Key Findings
- Most respondents (59.3%) prefer a moderate amount of information technology (IT) in their courses. Males prefer somewhat more IT in courses than females.
- Seniors report more use of spreadsheet, presentation, and graphics software in their courses the quarter/semester of the survey; freshmen report more use of social networking sites (SNSs); and community college students report generally less use of technology overall. Student major is a differentiator of which technologies are used.
- Only 23.0% of students agree that it would benefit students if their institution required them to take at least one entirely online course; 22.6% disagree and 23.4% strongly disagree.
- Half of respondents say they like to learn through programs they can control such as simulations and video games. About one-third of respondents like to learn by contributing content to websites or through podcasts and webcasts.
- The percentage of respondents who have used a course management system (CMS) increased in 2007 and remains at that level in 2008 (82.3%). Respondents are still positive (69.5%) about their CMS experience; only 5.3% are negative.
- Only half (49.8%) of respondents agree that their institution’s IT services are always available when they need them for course work; 33.4% are neutral and 16.8% disagree.
- Among respondents, 44.4% say that “most” or “almost all” of their instructors use IT effectively in courses, and about one-third of respondents say that “most” or “almost all” of their instructors provide adequate IT training, or understand student IT skill levels.
- Most respondents (62.3%) say they do not skip classes when materials from course lectures are available online. However, 17.1% do so.
- Of IT outcomes about student engagement, improved learning, convenience of course activities, and workplace preparedness, respondents are most positive about convenience. Respondents who are positive about these outcomes more often prefer more IT in courses, adopt IT earlier, and have a positive experience with CMSs and instructor use of IT.

Chris Dede of the Harvard School of Education observes that “faculty have typically used advances in IT either to automate conventional forms of instruction or to make small steps in expanding the range of communication and experience. But we have just scratched the
surface in examining the options emerging technologies offer for expanding the repertoire of ways we think and learn together.” Our 2008 data on the technologies students employ in their courses are consistent with this observation. Most undergraduates now use common workplace technologies and some specialized IT tools in their course work, but even though students are quickly adopting technologies emerging from the Web 2.0 world in their personal lives, they do not use them to any great extent in their course work. Blogs, wikis, graphics, video- and audio-creation software, podcasts, webcasts, multiuser games, virtual worlds, and a host of other technologies are still primarily used in the domain of students’ personal, rather than academic, lives.

At the same time, most students report that they are not looking for extensive use of IT in their courses. They are enthusiastic about the convenience afforded by CMSs and other IT, yet they place real value on face-to-face interactions with instructors and classmates. Even when course lecture materials are available online, most say they do not skip classes. To a lesser extent, students perceive that IT can improve their learning. And central to this expectation of IT as enabler of convenience and learning, students count on the institution’s IT services to be available any time they need them. This need is not entirely met, with only half of responding students agreeing that institutional IT services are available whenever they need them for courses.

Chapter 5 continues our 2008 update, looking more deeply into findings about IT and the academic experience, including

- student opinions about their instructors’ use of IT in courses, and
- student perceptions about the impact of IT on their courses.

Preference for IT in Courses

Each year, ECAR has asked students how much IT they prefer in their courses, using a 5-point scale from “no IT” to “exclusive IT.” Initially, ECAR expected that today’s undergraduates who have grown up with the Internet and computers would prefer courses heavily weighted with technology, in support of both learning and course administration. This has not been the case. In each of the past three years’ studies, students report preferring only a “moderate” amount of technology in courses (between 55% and 60% of respondents). Now, in 2008, 59.3% of respondents again say they prefer moderate IT in their courses (see Figure 5-1). Few respondents, about 1 in 20, prefer the extremes—either no technology (1.9%) or exclusive technology (3.6%) in their courses.

Amazingly, this desire for moderate IT in courses has remained constant, while technology has not. The types and number of technologies in use have increased; what technologies are popular with students has changed; and the overall density of technology is much greater. It follows that what respondents considered “IT” four years ago is likely different from what they consider “IT” today. In addition, various student populations undoubtedly have different views of what constitutes “IT.” For example, students who experience technology as fully integrated into their daily lives (rather like a fish in water) may no longer think of some technologies, such as networked services or enhanced cell phone capabilities (including Internet access), as IT. Despite this fluid technical environment and diversity of perceptions, respondents continue to state that they prefer only moderate IT in courses. This strongly suggests a widespread attitude that IT resources—no matter how
students think about them—are best situated in learning environments where technology is balanced with other learning activities, including face-to-face interactions in the classroom and with faculty and classmates.

Consistent with previous years’ studies, male respondents express a stronger preference for IT in courses, with 33.7% preferring extensive or exclusive IT in courses, compared with 19.8% of females. However, there is little difference on the basis of the other student demographics of age, class standing, major, part-time or full-time status, and on-campus or off-campus residence. Especially interesting is the finding that for the first time this year, age no longer makes a meaningful difference. Previous years’ studies found that younger students preferred less technology in courses and older students preferred more. In 2007, that difference was slight, and it appeared that there might be a trend away from age being a differentiator. Now, looking at the 2008 data, that trend is confirmed, and the pattern of preference for IT in courses is generally consistent across age groups. One speculation is that this is largely because technology is becoming increasingly integrated into the lives of learners in all age groups.

The desire for moderate IT in courses was evident in student comments from both the survey’s open-ended question and student focus groups. Students place real value on face-to-face instruction. One student said, “Nothing can adequately replace face-to-face lectures and recitations. Nothing. I don’t care how expensive the computers are, how high-definition the video is, or how fancy the presentation software is.” Research by Lotkowski, Robbins, and Noeth supports these comments. They examined more than 400 studies about factors contributing to student retention and degree completion, validating that improving student success is associated with strengthening the formal and informal contacts with the institution that develop confidence and competence in core communication skills. In sum, “face time” with faculty and peers contributes to students’ feeling included and integrated into the academic environment, and ultimately contributes to their success.

Further, data from previous ECAR studies find that students aren’t always positive about how instructors use IT, and this may also contribute to their preference for only moderate technology in courses.

### Technologies Used the Quarter/Semester of the Survey

Respondents identified which technologies they were actively using as part of their courses at the time of the 2008 ECAR survey (February 15 through April
Students and Information Technology, 2008

17, 2008). Table 5-1 shows that three technologies were used by many respondents: spreadsheets, presentation software, and college or university library websites. Given the prodigious amount of information on the web, it’s significant that two-thirds of respondents (67.7%) report accessing their institution’s library website during the quarter/semester of the survey. Surprisingly, the range of use reported by different majors is relatively small. All majors other than engineering show between 67% and 77% of respondents using the library website during the quarter/semester of the survey; fewer engineering students (55.5%) report doing so.

Seniors from four-year institutions report using more presentation, spreadsheet, and graphics software in courses this quarter/semester than either freshmen or community college respondents. This usage profile reflects that upper-division courses, often smaller and focused on student major, make greater use of these core applications. Community college use is lower for most technologies on the list.

Some technologies are used much more overall (for combined school, work, and recreation) than just specifically in courses during the quarter/semester of the survey (see Table 4-4 for overall use). Of special interest is the much higher overall use of podcasts (29.1%) and

Table 5-1. Technologies Used in Courses the Quarter/Semester of the Survey, by Class Standing

<table>
<thead>
<tr>
<th>Many Students Used This Quarter/Semester</th>
<th>Seniors (N = 11,629)</th>
<th>Freshmen (N = 8,924)</th>
<th>Community College Students (N = 3,317)</th>
<th>All Students (N = 27,317)</th>
</tr>
</thead>
<tbody>
<tr>
<td>College or university library website</td>
<td>70.8%</td>
<td>69.5%</td>
<td>53.2%</td>
<td>67.7%</td>
</tr>
<tr>
<td>Presentation software (PowerPoint, etc.)</td>
<td>73.1%</td>
<td>58.9%</td>
<td>41.8%</td>
<td>63.5%</td>
</tr>
<tr>
<td>Spreadsheets (Excel, etc.)</td>
<td>50.9%</td>
<td>38.8%</td>
<td>26.0%</td>
<td>43.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Few Students Used This Quarter/Semester</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wikis</td>
<td>19.3%</td>
<td>21.1%</td>
<td>14.9%</td>
<td>19.3%</td>
</tr>
<tr>
<td>Social networking websites (Facebook, MySpace, Bebo, LinkedIn, etc.)</td>
<td>15.4%</td>
<td>21.0%</td>
<td>11.3%</td>
<td>16.6%</td>
</tr>
<tr>
<td>Graphics software (Photoshop, Flash, etc.)</td>
<td>16.5%</td>
<td>10.7%</td>
<td>10.5%</td>
<td>13.5%</td>
</tr>
<tr>
<td>Instant messaging</td>
<td>12.8%</td>
<td>16.5%</td>
<td>8.8%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Programming languages (C++, Java, etc.)</td>
<td>10.6%</td>
<td>9.7%</td>
<td>5.3%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Discipline-specific technologies (Mathematica, AutoCAD, Stella, etc.)</td>
<td>10.5%</td>
<td>8.5%</td>
<td>5.1%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Blogs</td>
<td>7.9%</td>
<td>7.5%</td>
<td>5.4%</td>
<td>7.4%</td>
</tr>
<tr>
<td>E-portfolios</td>
<td>8.1%</td>
<td>3.9%</td>
<td>3.0%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Podcasts</td>
<td>4.2%</td>
<td>4.8%</td>
<td>1.5%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Video-creation software (Director, iMovie, etc.)</td>
<td>4.7%</td>
<td>3.6%</td>
<td>2.0%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Audio-creation software (Audible, GarageBand, etc.)</td>
<td>3.4%</td>
<td>3.4%</td>
<td>2.1%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Webcasts</td>
<td>2.9%</td>
<td>2.1%</td>
<td>2.6%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Online virtual worlds (Second Life, etc.)</td>
<td>1.0%</td>
<td>0.9%</td>
<td>1.6%</td>
<td>1.0%</td>
</tr>
</tbody>
</table>
webcasts (25.0%) compared with their specific use in courses during the quarter/semester of the survey (4.2% and 2.7%, respectively). Yet, even though webcast and podcast use is low overall, at certain institutions usage of these tools is high. Students in the focus group at Coppin State University, for example, all reported using webcasts in their courses and were pleased with their contribution to learning.

In 2008 as in previous years, student comments about podcasts (both audio and video) were quite positive—valued as a tool for missed classes and for studying course materials. A typical comment was, “Podcasts for my cognitive psychology class were amazing. It made studying for exams so much easier because I was able to look at the holes in my notes and relisten to the lecture to understand. I was also more focused on listening in class rather than frantically taking notes.”

There is a similar pattern for audio-creation and video-creation software. While about a third of respondents report using these software tools overall, fewer than 4% were using them for course work during the quarter/semester of the survey. This suggests that students are learning and using these technologies, but not necessarily for formal academic reasons. In fact, the 2007 ECAR survey found that two-thirds of respondents said they learned video/audio software out of personal interest.

The data show that 8.8% of respondents are already using online virtual worlds, and 1.0% used them in courses the quarter/semester of the survey. These online environments are in very early stages of adoption, and ECAR will track their growth in future studies. At this point, according to Linden Lab, maker of Second Life, at least 70 U.S. colleges and universities have taken up the challenge of using Second Life in an academic setting. A recent ECAR research bulletin describes a sampling of use in higher education teaching and learning. For example, Vassar College has built a Vassar Castle and a re-creation of the Sistine Chapel to enhance the learning experience.

Blogging in the academic context received mixed reviews. Negative comments came from students who did not like blogs used in place of class discussions, questioned the inclusion of personal information on class blogs, or felt faculty members “force using blogs when it doesn’t seem natural or necessary.” Others were enthusiastic about the course benefits of blogs, with comments such as “I feel I have more freedom to express myself” or “topics that don’t get discussed long enough in class can be fleshed out more online.”

Where Student Major Matters

In Chapter 4, ECAR reported qualitative data about students’ IT experience—specifically, that because their majors vary in the technologies required, students’ majors are influential in determining which IT skills they develop. The quantitative data on what technologies are used in courses this quarter/semester, shown in Table 5-2, support this idea, indicating how technology use varies by major. This finding is generally consistent with past years’ studies and lends support to the idea that careful decisions about where IT is introduced in courses can have a positive impact on student skill levels.

Overall, engineering students are the top users of spreadsheets, and also of the complex technologies of programming languages and technologies specific to their engineering discipline. Business majors are second in the use of spreadsheets, essential to the business world. Fine arts majors make greater use of graphics, video-creation, and audio-creation software.

E-portfolios continue to be primarily used by education majors. They are often used as a tool for teacher applicants to communicate the status of their teacher education requirements and qualifications to school district administrators. There is speculation that e-portfolios will be
adopted by other majors linked to professions requiring professional certifications. To date, this does not appear to be the case. Since 2006, when ECAR first asked this question, the overall use of e-portfolios has not significantly increased for education or other majors.

### Textbooks and IT

In their written responses, students raised issues about online course reading materials and textbooks—with about as many positive as negative comments. Much, but not all, of the discussion centered on costs, and the following themes emerged:

#### Table 5-2. Technologies Used in Courses This Quarter/Semester, by Major

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>College or University Library Website</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>1,401</td>
<td>55.5%</td>
</tr>
<tr>
<td>All other majors*</td>
<td>12,547</td>
<td>72.8%</td>
</tr>
<tr>
<td><strong>Spreadsheets (Excel, etc.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>1,837</td>
<td>72.8%</td>
</tr>
<tr>
<td>Business</td>
<td>2,827</td>
<td>64.8%</td>
</tr>
<tr>
<td>Physical sciences</td>
<td>743</td>
<td>56.1%</td>
</tr>
<tr>
<td>Life/biological sciences</td>
<td>2,372</td>
<td>47.8%</td>
</tr>
<tr>
<td>All other majors*</td>
<td>3,405</td>
<td>31.1%</td>
</tr>
<tr>
<td><strong>Graphics Software (Photoshop, Flash, etc.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine arts</td>
<td>636</td>
<td>33.3%</td>
</tr>
<tr>
<td>Engineering</td>
<td>521</td>
<td>20.6%</td>
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<tr>
<td>All other majors*</td>
<td>2,108</td>
<td>10.7%</td>
</tr>
<tr>
<td><strong>Video-Creation Software (Director, iMovie, etc.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine arts</td>
<td>186</td>
<td>9.7%</td>
</tr>
<tr>
<td>All other majors*</td>
<td>760</td>
<td>3.4%</td>
</tr>
<tr>
<td><strong>Audio-Creation Software (Audible, GarageBand, etc.)</strong></td>
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<td></td>
</tr>
<tr>
<td>Fine arts</td>
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<td>12.9%</td>
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<td>All other majors*</td>
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<td><strong>Programming Languages (C++, Java, etc.)</strong></td>
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<td></td>
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<tr>
<td>Engineering</td>
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<td>43.5%</td>
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<tr>
<td>Physical sciences</td>
<td>320</td>
<td>24.2%</td>
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<tr>
<td>All other majors*</td>
<td>986</td>
<td>4.9%</td>
</tr>
<tr>
<td><strong>Discipline-Specific Technologies (Mathematica, AutoCAD, STELLA, etc.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>1,009</td>
<td>40.0%</td>
</tr>
<tr>
<td>Physical sciences</td>
<td>331</td>
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</tr>
<tr>
<td>All other majors*</td>
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<td>6.6%</td>
</tr>
<tr>
<td><strong>E-Portfolios</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>616</td>
<td>22.4%</td>
</tr>
<tr>
<td>All other majors*</td>
<td>975</td>
<td>4.6%</td>
</tr>
</tbody>
</table>

*Responses not coded as one of the standard majors (“other” or “undecided”) are excluded.*
Textbooks with IT elements. Some students find the multimedia approach to content beneficial. A typical comment was, “I really enjoy the websites connected with my textbooks, which offer further study aids. My GPA is 4.0, and I credit these sites with helping me both achieve and maintain academic excellence.” Others objected to the additional costs. For example, one student said, “Books with IT are very expensive. The two books for anatomy cost $240 because of the additional IT.”

Cost savings of online readings and electronic books. Many students are sensitive to textbook costs. One student summed up, “Readings posted online are mercifully free (instead of ridiculously priced textbooks), and it’s nice to be able to access them from anywhere.” Another said, “The best use of IT would be online textbooks. They cost too much, especially when you consider that students, the ones with no money, are the ones required to buy them.”

Too much screen time. Typical comments were, “I do not like sitting at my computer squinting at 30 pages of text, but it is a pain to print them, and at 10 cents a page it can get expensive,” and “I hate reading textbooks online. This is because I spend most of my day on a computer and don’t want to go home and read on the darn thing.”

De-emphasizing textbooks. One student said, “I have found (via Google) other four-year institutions that have physics/chemistry lessons available online that teach key concepts 10 times more effectively. Sometimes I find myself learning concepts from these sites rather than trying to use the assigned textbook.” Another said, “I didn’t buy textbooks this semester. I haven’t missed them.”

Online Courses

Are there differences in perspective between students who are taking more online courses and those who are not? To answer this question, students were asked if they were currently taking “entirely” online courses. Only 2.8% of respondents were enrolled exclusively in online courses, and an additional 11.9% were taking a mix of online and face-to-face courses.

The strongest factor associated with whether respondents are or are not taking online courses is part-time or full-time status (see Figure 5-2). Almost no full-time students were taking all online courses, but more than 1 in 10 part-time students were doing so. Older respondents, regardless of part-time or full-time status, are also more inclined toward online courses. Nearly one-third (30.6%) of respondents aged 30 and older were enrolled in one or more entirely online courses the quarter/semester of the survey, in contrast with only 8.0% of respondents 18 and 19 years old and 13.6% of students 20 to 24 years old. This likely reflects the fact that older students and part-time students often have more family and work responsibilities, and value the flexibility offered by online courses.

In fact, nontraditional students (including part-time and older students) are driving the increase in online enrollments. In a five-year study on the growth of online learning published in 2007, the Sloan Consortium found that between 2002 and 2006, community colleges (with their higher numbers of nontraditional students) had the highest growth rates and accounted for more than one-half of all online enrollments. Bachelor’s institutions had the fewest enrollments and lowest growth rate. Similarly, the ECAR data show 20% of associate’s respondents taking at least one online course the quarter/semester of the survey, in contrast with 6.9% of bachelor’s respondents. The Sloan Consortium expects this trend to continue.
The question about online courses triggered many student comments. For those who like online courses, it is not surprising that the most common reasons were the convenience offered and the ability to take courses that would otherwise not be available to them. Often these responses came from nontraditional students. Some students also commented positively about online courses that were highly (electronically) interactive with other students and the instructor. One student expressed these ideas, saying, “I enjoy the convenience of online classes and believe students put more thought into their online posts than a student would have put into a comment made aloud in a classroom. It also allows discussion on any topic to continue to develop over the course of a semester.”

However, despite perceptions that students like online courses, the majority of written comments were negative. The following major themes emerged from the open-ended comments:

- **The lack of face-to-face interaction detracts from learning.** As expected, this is the most common theme, with a typical comment being “I feel that nothing rivals human instruction and interaction. There is more in-depth understanding purveyed in class through discussion and debate. Expressions and body language and verbal cues all contribute to our learning and understanding of key concepts.”

- **Online courses are too conducive to cheating.** One student says, “Cheating is practically encouraged in this domain. One person I know has her husband taking the class while she works.”

- **There are technical issues.** Problems are cited about network and software performance and error-prone processes, resulting in difficulties taking online exams and submitting course work. One student said, “It is frustrating when the server crashes during finals week or during times of high usage. There’s also too much room for error, e.g., hitting the wrong key, when taking online exams.”

- **Online courses are more demanding and require students to “teach themselves.”** One student summed this up, saying, “I find that the course loads are far heavier than in-class courses, so all gains in terms of convenience are totally lost.”
Most comments expressed a preference for balance, to incorporate technology in courses for convenience and creative teaching but to retain the valued classroom experience. This adds support to our earlier finding that most students prefer moderate IT in their courses.

A number of institutions, thinking that it is important for students to experience online courses, are considering the value of making this a requirement. The ECAR survey therefore asked students whether they agreed or disagreed with the statement “It would benefit students if my institution required students to take at least one entirely online course.” Figure 5-3 shows a resounding lack of support for this idea, with only 23.0% of respondents agreeing. Are students who are actively taking one or more entirely online courses more positive? The data show that they are, with 43.9% agreeing that the requirement is a good idea.¹ Still, not even half of these students think a requirement is a good idea. The negative response may be due both to the general lack of enthusiasm for online courses noted earlier from the qualitative data and to respondents’ taking issue with making the course a “requirement.” One student noted, “I have participated in many online courses and my experience is positive. However, I do not feel it should be mandatory. That would restrict freedom of choice, and not everyone learns well in that environment.”

### How Students Like to Learn with Technology

Educators using IT in courses are very interested in understanding how their students think about technologies as learning tools. To gather information about this topic, ECAR solicited help from Edward Dieterle while he was a doctoral student at the Harvard Graduate School of Education. In 2007 he designed a set of four questions (see Figure 5-4), and in 2008 ECAR added an additional question about learning through creating or listening to podcasts or webcasts.

Learning by searching the Internet has become commonplace, and most respondents say they like it (80.2%). The website students most often talked about in focus groups, and one that was also mentioned in survey comments, was Wikipedia—its state of flux and unreliability as a source, its contribution to learning, and how instructors disallow its use as a reference. Some students were adamantly critical, with comments such as “Sites/services like Wikipedia and the general Internet are horrible and should not be used under any circumstances in the academic realm.” Others

![Figure 5-3. It Would Benefit Students if My Institution Required Students to Take at Least One Entirely Online Course (N = 27,110)](image-url)
do turn to Wikipedia for answers, writing comments such as “In one of my classes there is no textbook. Sometimes Wikipedia is where we find the articles we are looking for.”

As in 2007, about half of respondents say they like to learn through programs they can control, such as video games and simulations (males more so than females). This finding that so many respondents are positive about gaming in a learning context is consistent with the assessment of digital game-based learning (DGBL) by Richard Van Eck of the University of North Dakota. He asserts that after years of DGBL research, there is now widespread public interest in using games as learning tools. He cites three contributing factors: the ongoing research conducted by DGBL proponents; the increased popularity of games; and the match between DGBL and Net Generation characteristics—that they require multiple streams of information, prefer inductive reasoning, like frequent and quick interactions with content, and have exceptional visual literacy skills.11

Interestingly, the majority of respondents are selective, with 50.9% reporting that they like to learn using just two or three of these technology groups. The number of respondents who like to learn using all five technology groups is relatively small (only 8.7%), as is the number of respondents who do not like to learn using any of these technology groups (9.4%). Further, since many respondents may not be experienced in these technologies, especially in a learning context, it is not surprising that a large proportion (6.6% to 25.8%) report that they do not know whether or not they like to learn using these technology groups.

ECAR data show consistency between respondents’ choice of technology groups they like for learning and the technologies they report using in general:

- Respondents who like to learn by contributing to websites, wikis, blogs, and the like also report more use of wikis and blogs in their courses the quarter/
semester of the survey and more often add content to wikis, blogs, or photo and video websites in general.

- Respondents who like to learn through creating or listening to podcasts or webcasts also report more use of podcasts and webcasts in their courses the quarter/semester of the survey and make more use of podcasts and webcasts in general.

There is noticeably more enthusiasm for these learning technologies among those who are early adopters of technology (see Figure 5-5). Currently, at least half or more of early adopters/innovators like to learn using each of these technology groups, and the differences between early and late adopters are especially large for the newer technologies on the list.

**Course Management Systems**

The 2005 and 2006 ECAR studies reported that about 72% of all respondents had taken a class using a CMS. Then, in 2007, the data showed a significant jump to 82.0% for the whole respondent population. Other research from EDUCAUSE and the Campus Computing Project report corroborated this 2007 ECAR finding. This year, ECAR data show that exposure to CMSs remains at this increased level (82.3%) and also indicate that the frequency of CMS use has remained the same as last year. Seniors, having spent more years in college, report greater use of CMSs than freshmen. Community college students report the least use of CMSs (see Figure 5-6).

Most respondents say that their overall CMS experience is either positive (57.8%) or very positive (11.7%) (see Figure 5-7). Although only 5.3% of respondents report a negative CMS experience, that represents a large number of actual respondents (about 1 in 20), especially considering the large number of CMS users and their overall high frequency of CMS use. Respondents reporting a positive CMS experience show a stronger technical profile. They prefer more IT in their courses, are more often early adopters of technology, use a CMS more frequently, and are more confident about their CMS skills. These
findings are generally consistent across the institutional characteristics of Carnegie class, size of student enrollment, and private versus public status; across student demographics of gender, age, and major; and across the past three ECAR studies.

CMSs are very much on the minds of students. Nearly one in six of the written survey comments mentioned CMSs in some context. Positive and negative comments were about equal, with positive comments focusing on the convenience of tracking grades and getting posted assignments and readings. Most of the complaints centered on reliability, but they also included the lack of user friendliness, poor faculty use, and the lack of consistent use by instructors. One student respondent thought that the convenience of the CMS was so great that the university should “make all professors use this technology, at the minimum for posting grades. It is great to have homework, notes, examples, sample tests, etc., available to view. It is more flexible than office hours, and much more convenient for students to keep up with their academic standing.” Results from the
EDUCAUSE 2007 Core Data Service report suggest that many students may have cause for similar sentiments. At the vast majority of campuses, faculty use CMSs selectively; fewer than 30% of institutions report that the CMS is used for all or nearly all courses.\textsuperscript{14} Some specific CMSs received more positive (or negative) comments in student responses than other systems, suggesting that from a student perspective there is a difference in CMSs and their implementations.

**Availability of IT Services for Course Work**

In 2007 a considerable number of respondents discussed problems accessing IT services—interruptions of the network, unavailability of the CMS, difficulty uploading/downloading files, and so forth. So in 2008, the survey asked respondents whether they agreed or disagreed with the statement “My institution’s IT services are always available when I need them for my course work.” The question focused specifically on availability for course work, excluding availability for recreation or work. The goal, of course, would be to have all students agree, but in fact Figure 5-8 shows that only half (49.8%) do so. The mean agreement is 3.39.

That leaves one-third of respondents neutral (33.4%) and another 16.8% actually in disagreement. A natural question, then, is whether this opinion about service delivery is consistent across the board or is found disproportionately at a subset of institutions. By far, most institutions (81.6%) show between 40% and 59% of students agreeing or strongly agreeing that IT services are always available for course work (see Figure 5-9). Very few institutions receive lower marks from students, and only one institution had a rating above 70%. Clearly, from a student perspective, there is room for improvement.

Table 5-3 shows that respondents’ CMS experience is highly associated with how they perceive their institution’s IT services availability for course work. Of those who agree or strongly agree that IT services are always available, 78.3% report a positive or very positive CMS experience; of those who disagree or strongly disagree, only 54.3% do so. This is not surprising, considering that comments about CMSs from the open-ended survey question often speak to their availability.

Student written comments corroborate this finding: They expect the network to be reliable, easy to use, and fast enough not only for course work but also for recreation. In addition to online game players’ complaints about network bandwidth or blocking of games, students talked about videos being too slow to watch, taking too long to load, or experiencing breaks in the video stream.

![Figure 5-8. My Institution’s IT Services Are Always Available When I Need Them for My Course Work (N = 26,947)](image-url)
Also, as with prior years, the expectation level for wireless coverage on campus is high. Numerous comments primarily asked for more wireless access or that the existing wireless be made more reliable and faster. For example, “It is rather annoying that in certain places on campus I cannot pick up a wireless signal to access the Internet. I like to be able to reference or look up things online while a professor is giving his/her lecture.”

**Skipping Classes When Materials Are Online**

Increasingly, through the campus CMS and other venues, course materials are made available online—syllabi, reading materials, sample exams, discussion boards, podcasts, lecture notes, PowerPoint presentations, and so on. In fact, in the 2007 study, almost all respondents with access to a CMS used the online syllabus (97.7%) and online readings and links to other text-based course materials (96.5%). Students report that this use of technology is a great convenience. However, they are also clear that they value face-to-face classroom interaction. The survey asked about the effect of easy online access to course materials on classroom attendance—are students tempted to skip classes? Figure 5-10 indicates that most students say “no.” The mean value is 2.26 (on the scale of 1 = strongly disagree to 5 = strongly agree), and almost two-thirds of respondents (62.3%) disagree that they skip classes for this reason. However, about one-sixth of respondents do say that online access to course materials does result in their skipping classes.

Students spoke to the issue of skipping class in their open-ended comments. There was a preference for instructors to post materials and
a general opinion that if professors do not add value in the classroom, then students are more likely to skip class. One student summed it up: “I believe that IT in courses is great when lecture is emphasized along with it. When professors repeat the same material that is on the website, students often skip class. However, if professors are able to communicate the online material creatively, students often do attend class.”

**Instructor Use of IT in Courses**

The 2007 ECAR survey asked respondents whether “Overall, instructors use IT well in my courses.” Although instructors received generally good marks, with more than half of respondents in agreement, more than 13% disagreed. The questions for the 2008 survey were modified on the basis of what students said in the 2007 focus groups and open-ended survey comments about instructor shortcomings using IT. To get more granular data on student perceptions, the measurement scale was changed, asking respondents to estimate how many of their instructors—almost none, some, about half, most, or almost all—used IT effectively, provided students with adequate IT training, and understood their students’ IT skills (see Figure 5-11).

The bottom-line finding is that fewer than half of students think that “most” or “almost all” of their instructors meet the criteria stated in each of our questions about IT in courses. The distributions of responses for these questions are surprisingly consistent across student demographics and types of institutions.

Respondents are most positive about the effective use of IT in courses, with 44.4% indicating that “most” or “almost all” of their instructors do so. With respect to the new questions about training, students are less enthusiastic. Only one-third of respondents say that “most” or “almost all” of their instructors provide adequate IT training or understand student skill levels; about half of respondents say that only “some” or “almost none” of their instructors do so. Many students commented that instructors need more training themselves, especially in commonly used software—not only so that instructors will use technology better, but also so they can help students. One comment was, “Instructors should receive IT training (Microsoft Excel, PowerPoint, Desire2Learn, etc.) and pass that knowledge to students. This would make classroom learning more effective.” This was echoed by a senior: “Faculty should just use technology. It’s not going away. The longer they wait, the harder it will be.”
A number of older students confessed to a lack of technology skills compared with their younger peers and noted that instructors do not take older students into consideration. One older student said, “I think many professors are more than willing to use IT in courses but then provide no support at all for students who are older or just unfamiliar with IT. The professors always pass the buck to IT support call centers. The call centers do what they can, but it would be preferable for the professors to provide support, considering it is their content and their choice to use IT.”

What factors make a difference in student perception about instructor use of IT? The data show that respondents who prefer more technology in their courses, use technologies more frequently, and are more skilled are generally more positive about their instructors’ use of IT in courses. This is especially true for CMSs, where 51.6% of respondents reporting positive CMS experience say that “most” or “almost all” of their instructors use IT effectively; only 27.6% of those reporting negative CMS experience do so. This finding confirms that there is high payoff for work done by campuses and their vendors to ensure and improve high-quality, easy-to-use CMSs for faculty and students.

Opinions about faculty use of IT—directly or indirectly—again dominate responses to the survey open-ended question. The content and themes are consistent with those found in the 2007 qualitative data and reported in depth in the 2007 study report.17

**IT Outcomes Related to Student Success**

One of higher education’s finest hours will be when it can be shown definitively that its enormous IT investments have a positive impact on student success. Today, however, after decades of research and debate, a full understanding of what leads to student success—even without factoring in the IT component—remains an ongoing challenge. To deepen higher education’s knowledge of student success, the National Postsecondary Education Cooperative (NPEC) sponsored a three-year initiative on student success. In their May 2007 summary report of the project’s culminating symposium, student success is defined at its simplest as getting students into and through college
to a degree or certificate. The report then acknowledges that **student success** is a generic label for a topic with many dimensions, ranging from student flow across the entire educational pipeline, to quality and content of learning and skills achieved as a result of going to college, to positive educational experiences (such as student engagement or satisfaction).18

Because the question of student success is so important, ECAR created four positive “outcome statements” about the impact of IT in courses and asked students whether they agreed or disagreed. These statements are derived from the significant body of literature generated by the NPEC initiative, and each represents a key dimension of student success.19 Findings about these outcome statements are described in the sections that follow.

- **Student engagement.** Over time, student engagement has been consistently and positively linked to student success.20 ECAR asked if students agreed with the statement “I get more actively involved in courses that use IT.”

- **Convenience.** Support for course activities is known to be associated with learning.21 ECAR asked if students agreed with the statement “IT makes doing my course activities more convenient.”

- **Learning.** ECAR included an overall self-assessment by students, asking them if they agreed with the statement “The use of IT in my courses improves my learning.”

- **Workplace preparedness.** In the 2007 comments, many students expressed their desire to be prepared, IT-wise, for jobs upon graduation. ECAR asked students if they agreed with the statement “By the time I graduate, the IT I have used in my courses will have adequately prepared me for the workplace.”

Perhaps the most obvious measure of student success is grade performance (GPA). For this reason, ECAR asks students for a self-reported cumulative GPA and looks at how GPA is related to other survey data. For example, are some current technologies—such as the Internet, spreadsheets, video- and audio-creation software, or complex gaming learning tools—associated with higher GPAs? Are other technologies—such as downloading music and video, gaming, or social networking sites (SNSs)—so distracting to academic studies that they negatively affect GPA? The ECAR data suggest that after controlling for known demographics that are related to GPA, such as age and gender, the other factors that ECAR analyzes are not strongly associated with respondent GPA.

### Overview of Student Perceptions about IT’s Impact on Courses

Figure 5-12 shows the distribution of responses for the ECAR outcome questions about student engagement, learning, convenience, and workplace preparedness. Convenience is the clear front-runner. Here, the number of agree responses (65.6%) far outweighs the combined disagree and neutral responses (34.4%). This is not surprising, because repeatedly in past studies—in both the quantitative data and the qualitative data—students have told us that convenience was the most valuable benefit of IT in courses. As one student told us, “Convenience makes it easier to learn!”

Perhaps most important is whether students perceive that IT in courses actually improves their learning. The data show that just fewer than half (45.7%) of respondents agree or strongly agree. Students made frequent reference to IT in this context, with comments such as “IT has greatly enriched my learning experience”
or “I took biology and if it weren’t for the computer, I wouldn’t have learned it. I could see the visualization of cells.” However, typical comments qualified the benefit of IT in learning—recognizing the contribution IT makes and at the same time pointing out that classroom learning is important and that IT must be used effectively. A common thought was, “Used effectively, IT can enhance the learning experience—sometimes even encourage students to learn better. However, IT is only one tool out of the many available for teaching/learning; it is not the only tool.”

At the same time, more than one in six students (15.1%) disagree that IT in courses improves their learning. Some of their comments belie the notion that all of today’s students are happy digital natives. One 22-year-old student, apparently in this group, commented, “I have found that I learn more, receive higher grades, and participate more in classes that do not require or even use IT as a part of the learning experience. I much prefer taking lecture notes (from a blackboard instead of PowerPoint) and reading textbooks to taking online quizzes and doing other online course activities.”

It’s noteworthy that in previous years’ studies (2005 through 2007), student responses to this question about learning were more positive. More than 60% agreed that IT in their courses had improved their learning, compared with 45.7% agreeing this year. At the other end of the scale, previous years’ data showed that fewer than 10% of respondents disagreed, compared with 15.1% disagreeing this year. ECAR looked carefully at possible reasons for this change. One factor may be the 2008 survey instrument itself, which was streamlined and changed the placement of this question vis-à-vis other questions, and also changed the wording from past tense to present tense to be consistent with other questions. These differences in the 2008 survey may have had some impact on respondent answers. Another possibility is that the data may be showing, at least in part, a real trend toward less agreement. As IT continues to be more integrated into respondent lives, it may be shifting how students think about IT in relation to their course work. This
Of the four outcome statements, there is least agreement about IT’s contributing to student engagement. Instead of responses skewed toward agreement, as with the other outcome statements, responses here form a more traditional bell-shaped curve. Although nearly one-third (31.8%) agree, the large majority of respondents are either neutral or actually disagree. The next section reports that IT’s impact on student engagement is most strongly associated with student preference for IT in courses, indicating that those students preferring more IT in courses are the ones who most often report more engagement in courses that use IT.

Chapter 4 reported that student use of and skill with IT varies on the basis of student major. Table 5-4 shows that student perceptions about the impact of IT on courses also vary on the basis of major. Overall, actual differences between majors are small, and the pattern of responses is similar for each of the four outcome statements. Business and engineering majors are somewhat more positive about the value of IT to their academic experience than students in the other disciplines. For example, 56.0% of business majors agree that IT in courses improves their learning; only 35.1% of humanities majors do so. Looking back at Table 5-2, one explanation might be that students in disciplines such as business and engineering are using more IT in courses (for example, spreadsheets or programming languages) that directly applies to the course subject. In contrast, students in majors such as social sciences and humanities may use IT more as a support function (such as CMSs) and find face-to-face discussions more central to the course subject matter.

Response patterns for the ECAR outcome statements about the impact of IT on courses are consistent across demographic factors—gender, age, class standing, GPA, part-time versus full-time enrollment status,
on-campus versus off-campus residence, Carnegie class, institution size, and private versus public status.

What, then, matters when it comes to IT’s impact on courses? The ECAR data show that the following factors are positively and strongly associated with the four outcome statements:

- student preferences for IT in courses,
- student technology adoption practices,
- experience with instructors’ use of IT in courses,
- positive or negative experience with CMSs,
- perceptions about the availability of IT services for course work at their institution
- how students like to learn using technology, and
- student skill levels in using IT.

These are discussed in the sections that follow.

### Preference for IT in Courses, IT Adoption Practice, and Outcomes

The factor most strongly associated with the outcome statements about IT’s impact on courses is how much IT respondents prefer in their courses (see Figure 5-13). Respondents who prefer more IT in courses agree more that IT has a positive impact on course work. With respect to learning, only 15% of respondents who prefer limited or no IT in courses agree that IT improves their learning; in contrast, 74.4% of respondents who prefer extensive or exclusive IT in courses agree. These relationships are extremely strong, and the wide range of student preference for IT is important to recognize and integrate into institutional decisions. For example, some institutions now provide information about the IT that will be used in scheduled courses so that students can factor this into their course enrollment choices.
Although not shown here, there is a similar stair-step pattern when looking at respondents’ technology adoption practices. Respondents who are early adopters of technology are more apt to be positive about the impact of IT on courses and learning. This is expected because students’ technology adoption practices and their preference for IT in courses are highly correlated.

### Instructors’ Use of IT, Student Experience with CMSs, and Outcomes

Research about the connection between instructor competence and student learning validates the intuitive idea that when instructors use effective educational practices, students have a better academic experience.\(^\text{25}\) It follows that when instructors integrate IT into effective teaching practices, students would be more likely to perceive both that their instructors use IT well in courses and that the effect of IT on their courses is positive. The data support this premise (see Figure 5-14). Among respondents reporting that “most” or “almost all” of their instructors use IT effectively, only 34% agree that IT in courses improves their learning.

CMS experience is also a strong differentiator when it comes to the ECAR questions about IT’s impact on courses. Respondents having an overall positive CMS experience more often report that IT in courses improves learning, convenience, and student engagement. Also interesting, students who indicate that their institution’s IT services are always available for course work are much more likely to agree with these outcome statements. It makes sense that a robust IT services environment promotes convenience, which can positively impact learning.

Finally, two other factors are associated with positive outcomes of IT in courses, although not nearly as strongly as the factors already discussed. Respondents reporting stronger IT skills and respondents who say they like to learn by using the technologies asked about in the survey—such as programs they can control; contributing to websites, blogs, wikis, and the like; creating or listening to podcasts or webcasts; and text-based conversations over e-mail, IM, and text messaging—are more positive about the benefits of IT in courses.
Endnotes


3. These findings are discussed in detail in the 2005, 2006, and 2007 ECAR studies of undergraduate students and information technology, whose bibliographical data were given in endnotes 1 and 2.


8. The distribution of the 98 participating institutions is as follows: 84 institutions had fewer than 5% of respondents taking entirely online courses, 10 institutions had between 5% and 10%, 2 institutions had between 12% and 15%, and 2 institutions had between 40% and 45%.


10. These results are just an approximation because some of the students who are not taking an entirely online course the quarter/semester of the survey may have taken one in the past, and it is likely this would affect their opinion of whether or not the requirement of an online course would benefit students.


12. Some students do not recognize the term course management systems, especially because institutions often give their CMS a local name. Therefore, this year the wording of the question was changed slightly to explain what is meant by a CMS. The question for
2005 through 2007 was of the format “Have you ever taken a course that used a course management system (e.g., ANGEL, WebCT, Blackboard, Desire2Learn, Moodle, Sakai, OnCourse, FirstClass)?” The question for 2008 was “Have you ever taken a course that used a course management system (CMS)? A CMS provides tools such as online syllabi, sample exams, and gradebook (e.g., WebCT, Blackboard, Desire2Learn, Sakai, or a campus-specific system).”


16. Ibid., 72–74.

17. Ibid., 85–88.


19. ECAR explicitly acknowledges important limitations to our data and process, including real limits to the application of survey research and self-reported outcomes about learning and engagement; an unmeasured nonresponse bias to the ECAR web-based survey coupled with a near certainty that web-based surveys are likely to result in somewhat inflated responses; and unresolved questions about the interplay between institutional action and student impact.


22. The 2005 through 2007 surveys had several questions about different aspects of convenience, such as IT providing support for communication and collaboration, allowing prompt feedback from instructors, and helping students control course activities. These questions received similar responses, so in 2008 they were combined into one statement about convenience, “IT makes doing my course activities more convenient.”

23. In previous years’ studies, the GPA categories in the survey were numerical (for example, under 2.00 to 4.00, in increments of 0.25). Beginning in 2008, ECAR is using the more standard letters, A to C–, as shown in Table 3-2 of this study.


Just in the span of my four college years, I am amazed at the difference between how my friends and I used social networking sites when I was a freshman and how everyone uses them now. We have a much higher level of maturity, and I believe our use will continue to evolve quickly.

—An undergraduate student

### Key Findings

- Fully 85.2% of respondents use one or more social networking sites (SNSs). The extent of SNS use has increased dramatically in the past two years.
- SNS usage differs considerably by age. Almost all respondents 18 and 19 years old use SNSs (95.1%), and only 37.0% of those 30 years and older do so. The majority of 18- and 19-year-olds have more than 200 SNS friends; the majority of those aged 30 and older have 25 or fewer SNS friends.
- Facebook is the most commonly used SNS (89.3% of SNS users), with MySpace as second choice (48.3% of SNS users). Traditional college-age respondents (18 to 24 years old) use Facebook more than MySpace; older respondents use MySpace more than Facebook.
- About half of SNS users use just one SNS, have only one SNS profile, and participate in one to five groups within SNSs. SNS profiles are fairly stable, with most respondents changing them monthly or less often.
- The majority of SNS users (55.8%) spend 5 hours or less per week on SNSs, and 26.9% spend 6 to 10 hours per week. Younger respondents report spending more time than older respondents.
- Half of SNS users use these sites to communicate with classmates about course-related topics; only 5.5% use them to communicate with instructors about course-related topics.
- Fewer than one-third of SNS users report that they are very concerned or extremely concerned about misuse of their information, security problems, cyberbullying or cyberstalking, or leaving a history that could cause them problems. Females and older respondents are generally more concerned.
- Most students (87.4%) put access restrictions on their profiles. Younger respondents and females are most likely to do so. Respondents who are more concerned about privacy and security problems are also more likely to restrict SNS access.
- Most Net Generation SNS users (18 to 24 years old) reveal the following information on their profiles: e-mail address or instant messaging (IM) screen name, last name, and full date of birth. Younger respondents are more likely to reveal personal information.
SNS companies continue developing their products, SNS applications are growing, campus administrators are exploring ways to use SNSs, and faculty are experimenting with SNS tools to support learning. At the same time, students continue to seamlessly adopt and adapt these services to their lives. It is essential that higher education understand undergraduate SNS practices because these sites are fundamentally changing the social fabric of the university.

What do the ECAR data tell us about student SNS use? Immediately obvious is the widespread Facebook and (to a lesser extent) MySpace culture among undergraduates. Net Generation students are the most avid SNS users, but older students are joining the SNS user ranks as well. And despite speculation that SNSs have become all-consuming for students, it appears that most students have reasonably and moderately integrated SNSs into their already technology-rich lives. Students typically use just one or two SNSs and don’t change their profiles often. They are not very concerned about privacy and security issues, perhaps because their common practice is to place access restrictions on their SNS profiles. They participate in a limited number of SNS groups (one to five) and average about an hour a day using SNSs. And within this framework, they keep in touch with literally hundreds of widely dispersed friends—most of whom they have already met in person. At this point in the evolution of SNSs, communicating with classmates via an SNS is common; communicating with instructors via an SNS is not. In fact, students expressed mixed, and often adamant, opinions about whether SNSs should be used as part of their formal learning.

Chapter 6 presents the full ECAR findings about students and SNSs, including
◆ students’ concerns about security and privacy,
◆ personal information that students reveal on SNSs, and
◆ restrictions students place on SNS profiles.

Who Uses SNSs?

Fully 85.2% of respondents report using one or more SNSs. More than half (56.8%) report using SNSs daily, and another 22.7% report using them weekly or several times per week. As expected, student age is the most powerful predictor as to whether a respondent uses SNSs (see Figure 6-1). Other demographic information ECAR collects—gender, on-campus versus off-campus residence, part-time versus full-time status, class standing, and student major—do not show meaningful differences once age is considered, and the same holds true for the institutional characteristics of Carnegie classification, institution size, and public versus private status.

For the past three years, ECAR has also kept longitudinal data about some SNS usage. Figure 6-2 shows that from the 2006 survey to the 2008 survey, an elapsed time of just two years, the 44 institutions that participated in all three years’ surveys had a decrease in respondents who never use SNSs, from 25.2% to 11.2%. But the biggest change is in how many respondents now use an SNS on a daily basis, increasing from about one-third in 2006 to almost two-thirds in 2008. The bottom line is, SNS usage has increased, and dramatically so.

To what extent will growth of SNS usage continue? In 2007, e-Marketer reported that 37% of all Internet users aged 18 and older (or 72 million people) used SNSs at least once a month and that 70% of all U.S. teens (12 to 17 years old) did so. They further estimate that SNS usage will continue to increase in 2008, with nearly 44% of adult Internet users and 77% of teen Internet users predicted to visit an SNS at least once a month.¹
The remaining sections in this chapter present analytical findings for just the 85.2% of the full respondent population who do use SNSs (N = 22,207). Percentages and means are based on this subpopulation.

*Data are based on student responses from the 44 institutions that participated in each of the 2006, 2007, and 2008 studies. Although the institutions remain the same, the actual students responding are different each year.
Which SNSs Are Used?

SNSs are extremely popular among undergraduates, and Facebook, with its origin in higher education, is clearly the SNS of choice. Of the 85.2% of respondents who use SNSs, 9 out of 10 use Facebook (see Table 6-1). The ECAR data suggest that there are no significant gender differences in the use of the SNSs listed in the survey, with one exception: Females are slightly more likely to use MySpace (51.9%) than males (42.2%). Eszter Hargittai, in a recent study of college students at the University of Illinois, also found that female college students were more likely to use MySpace but that there were not significant differences between men and women for use of Facebook, Xanga, or Friendster.2

ECAR’s data show that slightly fewer than half of respondents use MySpace (48.3%). This is well below the figure reported by other sources for SNS use across all age groups, suggesting that college students have distinctive SNS usage patterns. Hitwise, an online usage research firm, reports that MySpace is still by far the most popular SNS among U.S. users, accounting for 72.7% of all U.S. SNS visits for May 2008. Facebook ranks second with just 16.2% of visits.3 Josh Weil, cofounder and partner at Youth Trends, says that “MySpace never really stuck with the college crowd—it was (and still is) popular with teens and popular with twenty-somethings, but not among the 18- to 24-year-olds.”4 Indeed, traditional-age undergraduates participating in the focus groups indicated they associate MySpace with high school. One student noted, “I use MySpace for communicating with old high school friends and Facebook for my current college friends.” Another admitted, “I didn’t know about MySpace until my old friends from high school hassoned me into joining.” And at the other end of the Net Generation age range, among our respondents who were aged 25 and older, 72.7% reported using MySpace, greater than the rate of Facebook use and close to the Hitwise finding.

Even controlling for age, use of Facebook and MySpace differs significantly on the basis of Carnegie classification. At doctoral, bachelor’s, and master’s institutions, respondents use Facebook (92.5%) more than MySpace (45.2%); the reverse is true at associate’s institutions, where only 58.6% use Facebook and 81.5% use MySpace. This may reflect institutional culture, or possibly varying student demographics at these institutions. For example, Hargittai also found that Hispanic undergraduates are more likely than white/Caucasian students to use MySpace, and that Asian or Asian American students are less likely to use MySpace and more

Table 6-1. Social Networking Site Users’ Choices of Sites

<table>
<thead>
<tr>
<th>Social Networking Site</th>
<th>18–19 Years (N = 8,705)</th>
<th>20–24 Years (N = 10,929)</th>
<th>25–29 Years (N = 1,381)</th>
<th>30 Years and Older (N = 1,192)</th>
<th>All Users (N = 22,207)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>95.5%</td>
<td>92.9%</td>
<td>60.6%</td>
<td>44.9%</td>
<td>89.3%</td>
</tr>
<tr>
<td>MySpace</td>
<td>44.0%</td>
<td>45.1%</td>
<td>79.5%</td>
<td>73.2%</td>
<td>48.3%</td>
</tr>
<tr>
<td>Other</td>
<td>8.2%</td>
<td>7.8%</td>
<td>13.7%</td>
<td>17.6%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Yahoo! 360</td>
<td>2.3%</td>
<td>1.9%</td>
<td>6.6%</td>
<td>12.2%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Windows Live Space</td>
<td>3.0%</td>
<td>2.0%</td>
<td>3.5%</td>
<td>5.1%</td>
<td>2.6%</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>0.4%</td>
<td>3.1%</td>
<td>5.0%</td>
<td>9.7%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Friendster</td>
<td>0.9%</td>
<td>1.5%</td>
<td>4.3%</td>
<td>3.7%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Bebo</td>
<td>1.2%</td>
<td>0.9%</td>
<td>0.7%</td>
<td>1.6%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Sconex</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.1%</td>
</tr>
</tbody>
</table>
likely to use Xanga and Friendster. Further, students whose parents have lower levels of schooling are more likely to be MySpace users, whereas students whose parents have higher levels of education are more likely to be Facebook users.\textsuperscript{5}

The less popular SNSs in Table 6-1 are more often used by older students. Seniors (4.1%), closer to entering the workforce, make more use of LinkedIn than do freshmen (0.5%). In fact, a survey by the Institute for Corporate Productivity found that professionals most often used LinkedIn, followed by Yahoo! 360 and MySpace.\textsuperscript{6} Also, given the growing number of SNSs available, it makes sense that 8.9% of respondents say they use an SNS “other” than those specifically identified in the ECAR list.

\textbf{Profiles, Friends, and Groups}

Table 6-2 suggests that students generally focus their SNS activities on a limited number of sites. In fact, almost all SNS users frequent just one or two sites (91.3%). And of those who say they use exactly two SNSs, 88.1% report that these sites are Facebook and MySpace. Age does not seem to be a major factor in how many SNSs a respondent uses, although those who use three or more SNSs are somewhat more likely to be older respondents. Perhaps younger respondents have little reason to extend use beyond Facebook and MySpace, whereas older students benefit by adding a more specialized SNS such as LinkedIn for professional reasons.

To what extent do students use the most basic features of SNSs—profiles, friends, and groups? With respect to SNS profiles, the data suggest that the most common practice is to maintain one profile per SNS; for 4 out of 5 SNS users (80.6%), the number of profiles they report having is the same as the number of sites they report using.\textsuperscript{7} Only 11.2% of respondents say they have more profiles than the number of SNSs they use. Interestingly, respondents 25 years and older have stronger representation at the extremes, either having no profiles or having three or more profiles. This aligns with the earlier finding that older students are somewhat more likely to use more sites.

SNS friends are an entirely different matter. Almost 3 in 10 respondents (28.4%) say they have more than 300 SNS friends, and another 43.1% have 101 to 300 friends. Social networking researchers Nicole Ellison, Charles Steinfield, and Cliff Lampe report that having SNS friends facilitates creating and maintaining a large number of “weak ties”—people we are not particularly close to, such as friends of friends. They further suggest that keeping these “weak ties” (on Facebook) may be associated with higher levels of bridging social capital, which encompasses practical benefits such as receiving new information, ideas, and opportunities.\textsuperscript{8} Younger students appear much more facile in this regard. Among our respondents, half of Net Generation SNS users (18 to 24 years old) report having more than 200 friends; half of SNS users 30 years old and older report having 25 or fewer friends on SNSs.

Active participation in SNS groups that help people with shared interests keep in touch is associated with age among our respondents, though not as dramatically as SNS use itself. Overall, about 45% of respondents in every age group actively participate in one to five groups. Younger students are more likely to participate in more than five groups, and older students are more likely to participate in no groups at all. Not surprisingly, respondents with more friends participate in more groups. Of respondents with 25 or fewer SNS friends, only 5.8% participate in more than five groups; of respondents with more than 300 SNS friends, 38.0% participate in more than five groups. Student comments mentioned using SNSs for a diverse set of group activities. One student said, “SNSs have become measurably more important for my activist groups during my college career.”
Once created, SNS profiles appear to be fairly stable. Most respondents (80.7%) indicate that they change an SNS profile monthly or less often (see Figure 6-3). About one in five respondents change an SNS profile weekly or more often (19.4%). Here again, age matters, even within the Net Generation: 27.4% of 18- and 19-year-olds change their profiles weekly or more often, compared with 15.3% of those just a bit older (20 to 24 years old).

### How SNSs Are Used

For ECAR survey respondents, a primary use of SNSs is communicating and sharing with friends. Of the 13 uses ECAR asked about (see Figure 6-4), virtually all respondents report using SNSs to stay in touch with friends; two-thirds report using SNSs to share photos, music, and other works (females more so than males); and about half report using SNSs to invite friends to events and as a way to find out more about people. This distribution of responses is consistent with both focus group and written comments from students. About 15% of written comments mentioned SNSs, and three common themes emerged about the benefits of SNSs: enabling people to stay in touch, facilitating meeting new people, and providing a vehicle for getting noticed. (The sidebar “SNSs: Students’ Choice for Getting...
Figure 6-3. How Often Do You Change Your Social Networking Site Profiles? (N = 22,087)

Percentage of Students

Daily 1.4
Several times per week 3.4
Weekly 14.6
Monthly 35.4
Once a quarter/semester 26.4
Once a year 10.6
Never 8.3

Figure 6-4. How Social Networking Sites Are Used (N = 22,207)

Percentage of Students

Stay in touch with friends 96.8
Share photos, music, videos, or other work 67.7
Find out more about people (I may or may not have met) 51.6
Communicate with classmates about course-related topics 49.7
Plan or invite people to events 48.0
Participate in special-interest groups 27.3
Make new friends I have never met in person 16.8
As a forum to express my opinions and views 16.4
For professional activities (job networking, etc.) 11.6
Other 11.4
Communicate with instructors about course-related topics 5.5
Find someone to date 4.9
Respond to site advertisements 2.1
and Staying in Touch” provides example comments.) Precollege students, as well, show similar usage. In a 2007 Pew study, 91% of teens reported using SNSs for staying in touch with people they already know as friends and see a lot, and 82% reported staying in touch with friends they know but rarely see in person.9

SNSs do not seem to be so much about making friends of people students have never met in person (16.8%) or about finding someone to date (4.9%). Males are more likely to use SNSs to find someone to date (8.2%) than females (3.0%). Other research supports this finding. Ellison, Steinfield, and Lampe report that users are significantly more likely to report using Facebook to connect with others with whom they share an existing offline connection—either an existing friend, a classmate, someone living near them, or someone they met socially—than to use the site to meet new people.10

Table 6-3 illustrates that, as with SNS use itself and participation in groups, age is the driving factor in the way SNSs are used. Younger respondents are significantly more engaged in the six most common SNS uses (from the ECAR list in Figure 6-4). The less common SNS uses show similar use patterns across age groups. The one exception is using SNSs for professional activities, which occurs more often for older respondents. Older respondents (aged 25 and older) are also much more likely to use the SNS LinkedIn (14.7%) than younger respondents (3.5%).

Perhaps most interesting to colleges and universities is the finding that half of SNS respondents (49.7%) have integrated SNSs into their academic life as a mechanism to communicate with classmates about course-related topics, a finding consistent with the research reported in the study Introduction. As one student sums up, “I find Facebook to be helpful in talking about difficult homework assignments with classmates. It’s fast, convenient, and offers privacy.” Females are more likely to communicate with classmates about course-related topics (54.8%) than males (41.1%).

**SNSs: Students’ Choice for Getting and Staying in Touch**

- “It’s free! It’s so easy to send something to someone far away. My friends are on it. I talk to people abroad. It’s an easy way to keep in contact with friends.”
- “I used to be in the military. I use MySpace for keeping track of friends from all over the country. Their phone numbers and addresses change, but with MySpace they are always there. Also, others can find me.”
- “Facebook has been a great way to connect with old and new friends across the world in ways I had never imagined possible.”
- “Reuniting with old friends, maintaining long-distance friendships, and sharing photos are greatly facilitated by social networking sites.”
- “I love Facebook. It’s very useful. I am copresident of a club, and I use it daily to send messages, notifications, or event pages to members.”
- “I can hardly remember when Facebook didn’t exist. It would be very hard to adjust if it were to disappear. It is useful to keep in touch with my family back home, communicate about course work, and share photos.”
- “My aunt sent me birthday greetings on e-mail and on Facebook. I got the Facebook greeting first.”
- “I use Facebook primarily as a directory to look up useful information about people I’m trying to contact, or quite often just to remember someone’s name.”
- “I use social networking websites to gain popularity in the cyberworld. It’s a great way to meet new people and have them become your fans and to get comments, tips, ideas, etc., about what you are doing.”
Only 5.5%, however, extend their use of SNSs to communication with instructors about course-related matters. This corroborates both survey and focus group comments from students, which often carry a message that SNSs should remain in the realm of students’ personal lives. One student stated emphatically, “Social networking websites are exactly that: social networking websites. If a professor ever tried to use Facebook or MySpace as a means to give class materials or for anything other than social networking with students, I’d file an official complaint. Please do not even attempt to use Facebook or MySpace as teaching tools. This would end in disaster.”

On the other hand, a number of students were positive about instructor involvement in SNSs. One example was, “I think it would be a great idea for professors to create groups their students could join on sites such as Facebook. It would be great for discussions.” Another student’s comment hints that participation by teaching assistants might feel like less of an intrusion than that by professors: “Facebook keeps me in touch with my TAs and people from my classes. This makes it easier to get things cleared up and questions answered, as far as class work goes. Plus it is just really fun.”

The data show two other interesting characteristics about those who do engage SNSs to communicate with instructors:

- They are more likely to use SNSs for professional activities (37.9%) than others (10.1%).
- They are more likely to already communicate with classmates about course-related topics (89.6%) than others (47.4%).

This suggests that as increasing numbers of SNS users become comfortable with and practiced in using SNSs to communicate with

Table 6-3. How Social Networking Sites Are Used, by Age (N = 22,207)

<table>
<thead>
<tr>
<th></th>
<th>18–19 Years (N = 8,705)</th>
<th>20–24 Years (N = 10,929)</th>
<th>25–29 Years (N = 1,381)</th>
<th>30 Years and Older (N = 1,192)</th>
<th>All Users (N = 22,207)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Older Students Do More Than Younger Students</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For professional activities (job networking, etc.)</td>
<td>7.4%</td>
<td>12.8%</td>
<td>16.5%</td>
<td>25.3%</td>
<td>11.6%</td>
</tr>
<tr>
<td><strong>Older and Younger Students Do about the Same</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make new friends I have never met in person</td>
<td>20.8%</td>
<td>12.8%</td>
<td>19.6%</td>
<td>20.5%</td>
<td>16.8%</td>
</tr>
<tr>
<td>As a forum to express my opinions and views</td>
<td>17.5%</td>
<td>15.1%</td>
<td>18.2%</td>
<td>19.0%</td>
<td>16.4%</td>
</tr>
<tr>
<td>Communicate with instructors about course-related topics</td>
<td>5.9%</td>
<td>4.5%</td>
<td>5.9%</td>
<td>11.5%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Find someone to date</td>
<td>4.9%</td>
<td>4.5%</td>
<td>6.3%</td>
<td>6.2%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Respond to site advertisements</td>
<td>2.1%</td>
<td>2.1%</td>
<td>2.2%</td>
<td>3.4%</td>
<td>2.1%</td>
</tr>
<tr>
<td><strong>Younger Students Do More Than Older Students</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stay in touch with friends</td>
<td>98.3%</td>
<td>97.2%</td>
<td>95.6%</td>
<td>83.1%</td>
<td>96.8%</td>
</tr>
<tr>
<td>Share photos, music, videos, or other work</td>
<td>72.1%</td>
<td>67.9%</td>
<td>56.6%</td>
<td>46.0%</td>
<td>67.7%</td>
</tr>
<tr>
<td>Communicate with classmates about course-related topics</td>
<td>60.4%</td>
<td>47.1%</td>
<td>25.2%</td>
<td>22.9%</td>
<td>49.7%</td>
</tr>
<tr>
<td>Find out more about people (I may or may not have met)</td>
<td>56.2%</td>
<td>52.6%</td>
<td>35.8%</td>
<td>27.9%</td>
<td>51.6%</td>
</tr>
<tr>
<td>Plan or invite people to events</td>
<td>51.6%</td>
<td>51.2%</td>
<td>28.0%</td>
<td>16.6%</td>
<td>48.0%</td>
</tr>
<tr>
<td>Participate in special-interest groups</td>
<td>31.9%</td>
<td>25.6%</td>
<td>18.4%</td>
<td>19.5%</td>
<td>27.3%</td>
</tr>
</tbody>
</table>
classmates about course-related topics or in a professional context, communicating with instructors about course-related topics via SNSs may increase.

**Hours on SNSs**

When ECAR interviewed students in focus groups in 2007, students often said that they spent a lot of time on SNSs when they should be studying or doing other things. So, when students were asked in this year’s study how many hours they spent on SNSs, ECAR expected more hours of use than were reported. More than half (55.8%) report spending only 5 hours or less per week on all SNSs used (see Table 6-4). Another quarter of respondents (26.9%) spend 6 to 10 hours per week. The average is 7.3 hours per week, roughly an hour a day, and the median is 5 hours per week.11 A 2007 Michigan State University study reported comparable findings, with students spending an average of 7.4 hours per week using Facebook, an increase of about an hour per week from the time spent a year earlier.12

At the extreme, there is a group of SNS users (2.0%) who indicate spending more than 30 hours per week on SNSs, with females as likely to do so as males. Some of this extreme use may be due to respondents’ having SNSs open in the background and considering that to be active use of the site. Again, younger students are the most avid users of SNSs, even within the Net Generation. Although 26.1% of 18- and 19-year-olds spend more than 10 hours per week on SNSs, only 12.1% of those just a bit older (20 to 24 years old) do so.

Again this year, students in focus groups and in survey comments spoke to the time-consuming nature of SNSs. A junior music education major explained, “I used to check these sites a million times a day. Now I try and limit myself to four hours/week on MySpace and seven hours/week on Facebook.” A female sophomore complained, “I should be majoring in procrastination. Facebook is a great procrastination tool. It’s always up.” And jokingly, another student quipped, “Facebook is taking over people’s lives and should be taken off the Internet, ha ha.”

Those who spend more time online using SNSs show greater use of SNSs in specific areas:

- They have more friends and participate in more groups on SNSs.
- They change their SNS profiles more often.
- They report more SNS uses.
- They are more likely to reveal their e-mail address or IM screen name.

### Table 6-4. Hours per Week Using Social Networking Sites

<table>
<thead>
<tr>
<th></th>
<th>18–19 Years (N = 7,814)</th>
<th>20–24 Years (N = 9,902)</th>
<th>25–29 Years (N = 1,241)</th>
<th>30 Years and Older (N = 1,076)</th>
<th>All Users (N = 20,033)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 hours or less</td>
<td>42.5%</td>
<td>62.3%</td>
<td>70.2%</td>
<td>74.7%</td>
<td>55.8%</td>
</tr>
<tr>
<td>6–10 hours</td>
<td>31.4%</td>
<td>25.6%</td>
<td>18.4%</td>
<td>16.7%</td>
<td>26.9%</td>
</tr>
<tr>
<td>11–15 hours</td>
<td>10.6%</td>
<td>6.1%</td>
<td>5.3%</td>
<td>4.3%</td>
<td>7.7%</td>
</tr>
<tr>
<td>16–20 hours</td>
<td>6.7%</td>
<td>3.0%</td>
<td>2.4%</td>
<td>1.9%</td>
<td>4.4%</td>
</tr>
<tr>
<td>21–25 hours</td>
<td>3.0%</td>
<td>1.3%</td>
<td>1.2%</td>
<td>1.1%</td>
<td>1.9%</td>
</tr>
<tr>
<td>26–30 hours</td>
<td>2.4%</td>
<td>0.6%</td>
<td>0.2%</td>
<td>0.7%</td>
<td>1.3%</td>
</tr>
<tr>
<td>31–35 hours</td>
<td>0.5%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>36–40 hours</td>
<td>1.0%</td>
<td>0.5%</td>
<td>0.5%</td>
<td>0.2%</td>
<td>0.7%</td>
</tr>
<tr>
<td>More than 40 hours</td>
<td>1.9%</td>
<td>0.4%</td>
<td>0.6%</td>
<td>0.4%</td>
<td>1.0%</td>
</tr>
</tbody>
</table>
**Disclosing and Protecting Personal Information**

Much attention, from both the popular press and researchers, has focused on concerns about teen and undergraduate safety on the Internet in general and on SNSs in particular. SNS privacy problems can stem from the interplay between three factors: what personally identifiable data SNS users reveal, what SNS protection capabilities are provided (and used), and what specific end-user information on the SNS third parties are seeking out and using. Specifically, are students consciously or unconsciously allowing people they do not know and normally would not trust to have access to the personal information they have made available, and if so, is this information being used in a harmful or unexpected way? In fact, there are many documented cases of SNS access by employers, law enforcement, the media, university officials, marketing organizations, and others, resulting in difficulties for students who revealed information without considering the consequences.

The ECAR survey addresses these key issues, asking student SNS users what personal information they reveal on SNSs, what access limitations they place on SNS profiles, and to what extent they are concerned about privacy and security.

### Personal Information Revealed

Figure 6-5 shows types of personal information revealed on SNSs. It is common for all age groups to include their first name and personal photos. However, there is a striking difference in choices made by Net Generation respondents versus older respondents when it comes to posting other personal information. Among SNS users 18 to 24 years old, about 80% reveal their last name or how they can be reached (e-mail address or IM screen name). Among SNS users more than 24 years old, only half or fewer do so. More than half of Net Generation respondents reveal full date of birth, and again, very few older students do so. And 21.1% of Net Generation respondents (aged 18 to 24) reveal their mobile cell phone number. Evidently the line is somewhat drawn, even for the Net Generation, at revealing address or home phone number. Still, about 1 in 11 respondents in this younger age group does so.

Are there gender differences in what personal information students choose to put on SNSs? Figure 6-6 indicates that, for the most part, male and female patterns of behavior are similar. Females do, however, indicate more caution about revealing information that identifies them directly—last name, cell phone number, and address or home phone number. One finding from the Pew study on teens, privacy, and online social networks provides a clue about attitudes that may be found among incoming college students. Pew focus group data found that teens consistently say that the decisions they make about disclosing personal information on SNSs depend heavily on the context of the exchange. For example, whether or not the city where they live would be disclosed depends on the size of the city (for example, small town versus a large metropolitan area). An undergraduate respondent to our survey claimed, “It is up to each person to decide what information is appropriate to display to viewers around the world. I think there is no need to include age, full name, or address.”

### Privacy and Security Concerns

Overall, SNS users do not appear overly concerned about privacy and security issues. Figure 6-7 shows the actual distribution of responses to the ECAR questions on these issues, and Table 6-5 shows the means and related age and gender factors. The mean values for these four concerns are...
between “a little concerned” and “moderately concerned.” The most concern is for misuse of personal information and security problems, where about half of respondents are at least moderately concerned.

Why this general lack of concern? One possibility is that many students may not be aware of the actual audience viewing their information. One student pointed this out, saying, “Students who say they are not concerned are just unaware of the privacy risks inherent in social networking sites.” Alternatively, since SNSs have capabilities for protecting personal information, it is likely that respondents who do actively place restrictions and/or who take care
in what they put on SNSs factor that into their answers and express less concern. One student explained, “There can be negative consequences to social networking—but this is fixed quickly through privacy settings.”

Overall, the issues that arouse the most concern—although still less than moderate concern on average—are the potential misuse of personal information and security problems on SNSs, such as exposure to files.
Students and Information Technology, 2008

Carrying viruses. Older respondents report more concern: Although only one-fifth (20.7%) of SNS users 18 and 19 years old are very or extremely concerned about misuse of personal information, more than twice that number (44.9%) of those 30 years old and older are very or extremely concerned. It’s possible that older students are more knowledgeable about potential privacy risks and, having more job and family responsibilities, are more reluctant to reveal personal information that might cause conflicts.

It might be expected that seniors, closer to beginning their careers than are freshmen, would be more concerned about leaving a history that could compromise their job search. However, this does not appear to be the case; all age groups show concern about midway between “a little concerned” and “moderately concerned.” Nor did we find differences by gender. A wide range of comments indicated how students are thinking about and dealing with this issue. Some suggest that the apparent unconcern reflects a sense that dangers exist but that SNS participants have enough control to minimize them. “I am not at all worried about misuse of information or how it might impact my future,” one respondent wrote. “I don’t befriend strangers, I can tell when profiles might be malevolent, and I don’t post anything on any of my profiles that might be harmful in getting a job in the future.”

Taking a less restrained but still somewhat risk-aware approach, one senior commented, “I worry about future employers seeing my Facebook stuff. I will remove my stuff before I graduate.” Other comments noted opportunities as well as risks at the interface between social networking and professional life. “A few years ago I applied for a job to work as a digital editor,” one student wrote, “and the social networking site I was using at the time helped me gain notice of the work I am capable of doing. In the end, it really helped influence the employer to hire me.”

Respondents are least concerned with cyberbullying or cyberstalking. However, more females (44.3%) than males (27.7%) say they are at least moderately concerned. One female student reflected, “Facebook has become a way to stalk people. People I do not know are viewing my information.” Another noted, “I don’t use social networking because I am afraid my pictures or images can be altered in a bad way, especially sexually. You don’t know who is out there.” But other comments emphasized the same theme that appeared in some comments about job searches: Students understand and are comfortable with the risks. One student said, “I use a lot of the social networking sites. I have had many, many, many lectures on cyberstalking and what not to post about myself on the Internet. I think that students are smarter than older people give us credit for.”

<table>
<thead>
<tr>
<th>Concern</th>
<th>N</th>
<th>Mean*</th>
<th>Std. Deviation</th>
<th>More Concerned (Age and Gender)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security problems (exposure to files with viruses, etc.)</td>
<td>21,944</td>
<td>2.78</td>
<td>1.299</td>
<td>Older students/females</td>
</tr>
<tr>
<td>Misuse of my information</td>
<td>21,936</td>
<td>2.74</td>
<td>1.201</td>
<td>Older students</td>
</tr>
<tr>
<td>Leaving a history that could cause me problems (such as when applying for a job)</td>
<td>21,917</td>
<td>2.60</td>
<td>1.408</td>
<td>–</td>
</tr>
<tr>
<td>Cyberbullying or cyberstalking</td>
<td>21,754</td>
<td>2.30</td>
<td>1.338</td>
<td>Females</td>
</tr>
</tbody>
</table>

*Scale: 1 = not at all concerned, 2 = a little concerned, 3 = moderately concerned, 4 = very concerned, 5 = extremely concerned
Females are also more concerned about security problems such as exposure to files with viruses. This makes sense, given our earlier findings that females are much less comfortable with their computer maintenance skills than are males.

**Restricting Access to SNS Profiles**

Students may be willing to post personal information on SNSs in part because they are confident about and use SNS access-limiting capabilities to ensure their privacy and protection. Figure 6-8 indicates that most respondents using SNSs do put restrictions on who can access their profiles (87.4%), and nearly half (45.4%) say they put a lot of restrictions on their profiles. Females are more likely to place restrictions, and to place more restrictions, than males.

The data again suggest a difference between younger and older students (see Figure 6-9) in the way they handle SNS risk: Younger respondents reveal more but are more restrictive about access, whereas older respondents reveal less but are not as restrictive. It may be that younger SNS users have more trust in restrictions, or they may simply know more about them than older students. In fact, many undergraduates now come to college already versed in using SNS profile restrictions. A freshman said, “I don’t talk to anyone I don’t know on these sites. I have a name but no picture. If I don’t know you, I treat it as spam. I limit who gets to know what about me.”

The 2007 Pew study found that among SNS teen users, 66% limit access in some way. However, the study also found that although most teens take steps to limit what others can know about them from SNS profiles, many also acknowledge the power of the Internet to track down individuals. Some 23% of teen profile creators say it would be “pretty easy” for someone to find out who they are from their profile information, and 40% think it would be hard to find out who they are but that they could eventually be identified.17

Older respondents, as shown previously in Figure 6-5, put less personal information on the SNS in the first place, perhaps to limit exposure, and so may perceive less need for SNS profile restrictions. (It’s also worth noting again that older students are less likely to use SNSs at all.) Many students use a mix—restricting access and consciously choosing what to put on their profiles.

![Figure 6-8. Restricting Access to Social Networking Site Profiles, by Gender](image-url)
How are these three aspects of SNSs—personal information revealed, concerns about privacy and security, and profile restrictions—related? 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 (see Figure 6-10). These SNS users are also somewhat more likely to reveal less personal information on SNSs. This suggests that understanding risks and consequences of security and privacy exposure, along with understanding methods for protecting personal information, can help students decide what information they reveal and/or protect.

**Reasons for Nonparticipation in SNSs**

ECAR asked the 14.8% of respondents who do not use SNSs why they don’t participate. Are respondents staying away from SNSs because they simply don’t wish to participate, or are perceived security and privacy exposures driving them away? ECAR found more evidence for the former than the latter: 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 don’t like SNSs, whereas security and privacy concerns were less frequently chosen (see Figure 6-11). Typical comments include:

- “Substituting e-friends for real friends is not only sad, it’s counterproductive to living a healthy normal life.”
- “Social networking websites are abhorrent. While I like the idea of ‘a world community,’ humanity has a lot of maturing to do before any of these sites can ever work as positively as intended.”
- “Social networking sites are a bore, and I feel my time is better spent off these sites.”

However, a significant number of respondents do point to security concerns (19.0%) and privacy concerns (34.6%), and some of these respondents might choose to use SNSs if they perceived privacy and security problems as remedied or if they were more knowledgeable about how to use privacy settings. One student commented, “I have chosen not to participate in social networking websites. I am
aware that employers search such websites when reviewing prospective employees. And I do not want to spend my time policing links to my profile that others may have added that might affect me negatively.”

**Endnotes**

2. Eszter Hargittai, “Whose Space? Differences among Users and Non-Users of Social Network Sites,”


5. Hargittai, “Whose Space?”


7. This finding may be somewhat overstated because we cannot be certain that if a respondent uses two SNSs and has two profiles, each SNS has only one profile. It is possible that both profiles are on only one SNS.


11. This number will be slightly understated, since the scale for the question “Approximately how many hours each week do you use social networking websites?” was “Less than 1,” 1 to 50 (in increments of 1), or “More than 50.” The last category is only 0.7% of respondents, and these respondents were all considered to use SNSs 51 hours per week for this calculation, which will be less than their actual usage.


15. The number of responses may be slightly understated because some respondents may have thought that if they included personal information on their profile and then placed restrictions, they were not “revealing” the personal information.

16. Lenhart and Madden, “Teens, Privacy & Online Social Networks.”

17. Ibid.
Appendix A

Acknowledgments

We express our sincere appreciation to the following individuals who helped us make this study possible. Their contributions include securing institutional approval to do the study at their institution, selecting a sample of students to invite to participate and inviting them to do so, recruiting students to participate in focus groups, and performing a variety of other tasks.

Adelaine, Michael—South Dakota State University
Allison, Debra—Miami University
Ambur, Roberta—The University of South Dakota
Anderson, Tamara—Community College of Rhode Island
Andrews, Ken—University of Texas HSC at San Antonio
Backscheider, Nickolas—Auburn University
Bauer, Kati—University of Michigan—Ann Arbor
Benson, Marisa—Emory University
Bielec, John A.—Drexel University
Biros, Jan—Drexel University
Bixler, Cindy—Embry-Riddle Aeronautical University
Black, Kim—University of Northern Colorado
Braddlee, Dr.—Simmons College
Brewer, Laura—Arizona State University
Brookes, Kim—Simmons College
Brorby, Michael—Purdue University Calumet
Brown, Wayne A.—Johnson County Community College
Brown, Yvette—Barry University
Brum, Debra A.—California State Polytechnic University, Pomona
Brynes, Abby—Coppin State University
Bushey, Stephanie—Hofstra University
Cahill, Rosann—University of St. Thomas
Campbell, John P.—Purdue University
Carr, Daryl—Monmouth College
Caruso, Judy Borreson—University of Wisconsin—Madison
Cernock, Robert—Central Connecticut State University
Chancellor, Beth—University of Missouri–Columbia
Charles, John—California State University, East Bay
Chichester, Susan E.—SUNY College at Geneseo
Contos, Chris—Vanderbilt University
Cromwell, Dennis—Indiana University
Crowe, Mary—University College Dublin
Dalton, Genevieve—University College Dublin
Davis, Bill—Bridgewater State College
Denman, Chip—University of Maryland
Diaz, Veronica—Maricopa Community College District
Doetkott, Curt—North Dakota State University
Draude, Barbara—Middle Tennessee State University
Drechsel, Carol—University of North Dakota
Durso, Ann Marie—University of Wisconsin–Parkside
Duszynski, Tom—Wayne State University
Eckhardt, Chip—University of Wisconsin–Eau Claire
El-Haggan, Ahmed—Coppin State University
Elmore, Garland C.—Indiana University-Purdue University Indianapolis
Fleagle, Steve—The University of Iowa
Foster, Susan J.—University of Delaware
Franke, Thomas L.—University of New Hampshire
Fritz, John—University of Maryland, Baltimore County
Gianforte, Danna—Pepperdine University
Gonick, Lev S.—Case Western Reserve University
Hale, Mark—The University of Iowa
Hanson, Perry O. III—Brandeis University
Henderson, Jane—University of Wisconsin–Stout
Hilton, Linda—Vermont State Colleges
Houston-Brown, Clive—University of LaVerne
Huish, Darrel—Maricopa Community College District
Hurley, Douglas E.—The University of Memphis
Huskamp, Jeffrey—University of Maryland
Jasper, Joanna L.—Catawba College
Jonas, James—University of Wisconsin–Madison
Jones, Kristine—Colorado College
Justice, Debbie—Western Carolina University
Kaczmarzyk, Lisa—University of California, San Diego
Kelley, Sherry—Eastern Michigan University
Kerian, Dorette R.—University of North Dakota
Kiggins, Beth—University of Indianapolis
King, Beverly—University of North Carolina at Pembroke
King, Rebecca L.—Baylor University
Kloberdanz, Rosalinda—North Dakota State University
Koralesky, Barron—Macalester College
Kossuth, Joanne M.—Franklin W. Olin College of Engineering
Kovalchick, Ann—Tulane University
Kraemer, Ronald—University of Wisconsin–Madison
Kroghman, John A.—University of Wisconsin–Platteville
Kunnen, Eric—Grand Rapids Community College
Landry, Stephen G.—Seton Hall University
Lea, Lucinda T.—Middle Tennessee State University
Ledbetter, Phil—Embry-Riddle Aeronautical University
Levy, Samuel J.—University of St. Thomas
Maas, Bruce—University of Wisconsin–Milwaukee
McClelland, Kathy—Auburn University
Mendola, Richard A.—Emory University
Merritt, Shane—University of Alabama
Miller, Jim—Granite State College
Moroukian, Michael M.—Granite State College
Nielsen, Brian—Northwestern University
Ormsby, Colin—California State University, East Bay
Orr, Robert—University of North Carolina at Pembroke
Pletcher, Kathy—University of Wisconsin–Green Bay
Pokot, Elena—University of Wisconsin–Whitewater
Rehm, Roger—Central Michigan University
Appendix B

Students and Information Technology in Higher Education:

2008 Survey Questionnaire

1. **How old are you?** We may only survey students 18 years or older. Required.
   (Drop down menu including under 18 and 18 through 99. Respondents under 18 must exit the survey.)

2. **To enter the drawing for gift certificates, please enter your e-mail address.**
   Optional.______________________________

3. **How old is your personal desktop computer?**
   [ ] Don’t own a desktop computer
   [ ] Less than 1 year old
   [ ] 1 year old
   [ ] 2 years old
   [ ] 3 years old
   [ ] 4 years old
   [ ] More than 4 years old

4. **How old is your personal laptop computer?**
   [ ] Don’t own a laptop computer
   [ ] Less than 1 year old
   [ ] 1 year old
   [ ] 2 years old
   [ ] 3 years old
   [ ] 4 years old
   [ ] More than 4 years old
5. **Approximately how many hours each week do you spend actively doing Internet activities for school, work, or recreation?**

(Drop down menu including Less than 1, 1 to 168 (1 hour increments).)

6. **How often do you do the following (for school, work, or recreation)?**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never per year</th>
<th>Once per quarter or semester</th>
<th>Monthly</th>
<th>Weekly</th>
<th>Several times per week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Instant message</td>
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<tr>
<td>b. Text message</td>
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<tr>
<td>c. Use the Internet from a cell phone or PDA</td>
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<tr>
<td>d. Download web-based music or videos</td>
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<td>e. Use the college/university library website</td>
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<td>f. Spreadsheets (Excel, etc.)</td>
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<td>g. Presentation software (PowerPoint, etc.)</td>
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<td>h. Graphics software (Photoshop, Flash, etc.)</td>
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<td>i. Audio-creation software (Audible, GarageBand, etc.)</td>
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<tr>
<td>j. Video-creation software (Director, iMovie, etc.)</td>
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<tr>
<td>k. Social networking websites (Facebook, MySpace, Bebo, LinkedIn, etc.)</td>
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<tr>
<td>l. Online multiuser computer games (World of Warcraft, Everquest, Poker, etc.)</td>
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<td>m. Online virtual worlds (Second Life, etc.)</td>
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<td>n. Podcasts</td>
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<tr>
<td>o. Webcasts</td>
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<td></td>
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<tr>
<td>p. Social bookmark/tagging (del.icio.us, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. **During the academic year, how do you most frequently access the Internet?**

[ ] Dial-up service

[ ] High-speed (wired or wireless)
8. Do you own a cell phone that is capable of accessing the Internet (whether you use that capability or not)?
   [ ] No, and don’t plan to purchase one in next 12 months
   [ ] No, but plan to purchase one in next 12 months
   [ ] Yes
   [ ] Don’t know

9. How often do you contribute content to the following (for school, work, or recreation)?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once per year</th>
<th>Once per quarter or semester</th>
<th>Monthly</th>
<th>Weekly</th>
<th>Several times per week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Wikis (Wikipedia, course wiki, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>b. Blogs</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Photo or video websites (Flickr, YouTube, etc.)</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

10. What is your skill level for the following?

<table>
<thead>
<tr>
<th></th>
<th>Not at all skilled</th>
<th>Not very skilled</th>
<th>Fairly skilled</th>
<th>Very skilled</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Using the college/university library website</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>b. Spreadsheets (Excel, etc.)</td>
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</tr>
<tr>
<td>c. Presentation software (PowerPoint, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Graphics software (Photoshop, Flash, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Computer maintenance (software updates, security, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Using the Internet to effectively and efficiently search for information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Evaluating the reliability and credibility of online sources of information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Understanding the ethical/legal issues surrounding the access and use of digital information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Which best describes your preference?

   [ ] I prefer taking courses that use no information technology.
   [ ] I prefer taking courses that use limited information technology.
   [ ] I prefer taking courses that use a moderate level of information technology.
   [ ] I prefer taking courses that use information technology extensively.
   [ ] I prefer taking courses that use information technology exclusively.
12. Are you using the following for any of your courses this quarter/semester? 
   Check all that apply.
   [ ] a. Spreadsheets (Excel, etc.)
   [ ] b. Presentation software (PowerPoint, etc.)
   [ ] c. Graphics software (Photoshop, Flash, etc.)
   [ ] d. Audio-creation software (Audible, GarageBand, etc.)
   [ ] e. Video-creation software (Director, iMovie, etc.)
   [ ] f. Programming languages (C++, Java, etc.)
   [ ] g. Webcasts
   [ ] h. Podcasts
   [ ] i. E-portfolios
   [ ] j. Discipline-specific technologies (Mathematica, AutoCAD, STELLA, etc.)
   [ ] k. Instant messaging
   [ ] l. Social networking websites (Facebook, MySpace, Bebo, LinkedIn, etc.)
   [ ] m. Wikis
   [ ] n. Blogs
   [ ] o. Online virtual worlds (Second Life, etc.)
   [ ] p. College or university library website

13. How many of your courses this quarter/semester are entirely online?
   [ ] None
   [ ] Some
   [ ] All

14. It would benefit students if my institution required students to take at least one entirely online course.
   [ ] Strongly disagree
   [ ] Disagree
   [ ] Neutral
   [ ] Agree
   [ ] Strongly agree
   [ ] Don’t know

15. How many of your instructors:

<table>
<thead>
<tr>
<th></th>
<th>Almost None</th>
<th>Some</th>
<th>About Half</th>
<th>Most</th>
<th>Almost All</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Use information technology (IT) effectively in courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Provide students with adequate training for the IT the instructor uses in his or her course</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Understand the IT skill levels of their students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
16. What is your opinion about the following statements?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I get more actively involved in courses that use IT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. The use of IT in my courses improves my learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. IT makes doing my course activities more convenient.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. By the time I graduate, the IT I have used in my courses will have adequately prepared me for the workplace.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. My institution's IT services are always available when I need them for my coursework.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. I skip classes when materials from course lectures are available online.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. Have you ever taken a course that used a course management system (CMS)? A CMS provides tools such as online syllabi, sample exams, and gradebook (e.g., WebCT, Blackboard, or a campus-specific system). Required.

[ ] No. Proceed to 21.
[ ] Yes. Proceed to 18.
[ ] Don't know. Proceed to 21.

18. How often do you use course management systems?

[ ] Never
[ ] Once a year
[ ] Once a quarter/semester
[ ] Monthly
[ ] Weekly
[ ] Several times per week
[ ] Daily

19. What is your skill level using course management systems?

[ ] Not at all skilled
[ ] Not very skilled
[ ] Fairly skilled
[ ] Very skilled
[ ] Expert
20. Describe your overall experience using course management systems.

[ ] Very negative
[ ] Negative
[ ] Neutral
[ ] Positive
[ ] Very positive

21. Which of the following best describes you?

[ ] I am skeptical of new technologies and use them only when I have to.
[ ] I am usually one of the last people I know to use new technologies.
[ ] I usually use new technologies when most people I know do.
[ ] I like new technologies and use them before most people I know.
[ ] I love new technologies and am among the first to experiment with and use them.

22. I like to learn through:

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Text-based conversations over e-mail, IM, and text messaging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Programs I can control, such as video games, simulations, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Contributing to websites, blogs, wikis, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Running Internet searches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Creating or listening to podcasts or webcasts</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

23. Do you use any social networking websites (Facebook, MySpace, Bebo, LinkedIn, etc.)? Required.

[ ] No. Proceed to 34, then to 35.
[ ] Yes. Proceed to 24–33, skip 34, go to 35.
[ ] Don’t know. Proceed to 35.

24. Approximately how many hours per week do you use social networking websites?

(Drop down menu including Less than 1, 1 to 50 (in increments of 1), More than 50.)
25. Which of the following social networking websites do you use? 
   *Check all that apply.*
   - [ ] a. Bebo
   - [ ] b. Facebook
   - [ ] c. Friendster
   - [ ] d. LinkedIn
   - [ ] e. MySpace
   - [ ] f. Sconex
   - [ ] g. Windows Live Spaces
   - [ ] h. Yahoo! 360
   - [ ] i. Other

26. How do you use social networking websites? *Check all that apply.*
   - [ ] a. Stay in touch with friends
   - [ ] b. Make new friends I have never met in person
   - [ ] c. Find out more about people (I may or may not have met)
   - [ ] d. Find someone to date
   - [ ] e. As a forum to express my opinions and views
   - [ ] f. Share photos, music, videos, or other work
   - [ ] g. For professional activities (job networking, etc.)
   - [ ] h. Communicate with classmates about course-related topics
   - [ ] i. Communicate with instructors about course-related topics
   - [ ] j. Participate in special interest groups
   - [ ] k. Plan or invite people to events
   - [ ] l. Respond to site advertisements
   - [ ] m. Other

27. How many profiles do you currently have at social networking websites?
   - [ ] None
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6–10
   - [ ] 11–20
   - [ ] 21–30
   - [ ] More than 30

28. How often do you change your profiles?
   - [ ] Never
   - [ ] Once a year
   - [ ] Once a quarter/semester
   - [ ] Monthly
   - [ ] Weekly
   - [ ] Several times per week
   - [ ] Daily
29. How many friends do you currently have at all the social networking websites you use?

[ ] None
[ ] 1–25
[ ] 26–50
[ ] 51–75
[ ] 76–100
[ ] 101–200
[ ] 201–300
[ ] More than 300

30. How many groups do you actively participate in at all the social networking websites you use?

[ ] None
[ ] 1–5
[ ] 6–10
[ ] 11–20
[ ] 21–30
[ ] 31–40
[ ] 41–50
[ ] More than 50

31. What information about yourself do you reveal on social networking websites?

Check all that apply.

[ ] a. First name
[ ] b. Last name
[ ] c. E-mail address or IM screen name
[ ] d. Address or home phone number
[ ] e. Full date of birth
[ ] f. Cell phone number
[ ] g. Photos
[ ] h. Class information/schedule
[ ] i. Work place
[ ] j. Spring break/holiday plans

32. Do you limit or restrict who has access to your profiles?

[ ] I don’t restrict access.
[ ] I put some restrictions on access.
[ ] I put a lot of restrictions on access.
[ ] Don’t know
33. How concerned are you about the following at social networking websites?

<table>
<thead>
<tr>
<th>Concern</th>
<th>Not at all concerned</th>
<th>A little concerned</th>
<th>Moderately concerned</th>
<th>Very concerned</th>
<th>Extremely concerned</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Misuse of my information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Security problems (exposure to files with viruses, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Cyberbullying or cyberstalking</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>d. Leaving a history that could cause me problems (such as when applying for a job)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

34. Why don’t you participate in any social networking websites? *Check up to 3.*

- [ ] a. Don’t like them
- [ ] b. Don’t know how to use them
- [ ] c. Amount of time and effort required
- [ ] d. Not interested
- [ ] e. Little or slow network access
- [ ] f. Access is blocked by my institution or Internet provider
- [ ] g. Privacy concerns (misuse of my personal information)
- [ ] h. Security concerns (exposure to files with viruses, etc.)
- [ ] i. Other

35. What is your gender?

- [ ] Male
- [ ] Female

36. What is your cumulative grade point average (GPA)?

- [ ] A
- [ ] A-
- [ ] B+
- [ ] B
- [ ] B-
- [ ] C+
- [ ] C
- [ ] C- or lower
- [ ] Don’t know
37. What is your class standing?
   [ ] Senior
   [ ] Freshman
   [ ] Other

38. Are you currently a full-time or part-time student? Part-time is fewer than 12 credit hours per quarter/semester.
   [ ] Full-time
   [ ] Part-time

39. Do you reside on campus or off campus?
   [ ] On campus
   [ ] Off campus

40. What are you majoring in? Check all that apply.
   [ ] a. Social sciences
   [ ] b. Humanities
   [ ] c. Fine arts
   [ ] d. Life/biological sciences, including agriculture and health sciences
   [ ] e. Physical sciences, including math
   [ ] f. Education, including physical education
   [ ] g. Engineering
   [ ] h. Business
   [ ] i. Other
   [ ] j. Undecided

41. Which institution are you attending? Required. Before proceeding, please confirm that the name of your institution appears. <Drop-down list of institutions.>

42. Is there anything you would like to tell us about your experience with IT in or out of courses, or about your experience with social networking websites?

Thank you! You have reached the end of the survey. Visit the ECAR website to see our research and learn more about the EDUCAUSE Center for Applied Research. If you have any questions or concerns, please e-mail ecar@educause.edu.

— END SURVEY —
Appendix C

Qualitative Interview Questions

Questions for Student Focus Groups

1. Background
   1.1 Student information: age, gender, senior/freshman, full/part time, on/off campus, major discipline.
   1.2 How many computers do you own? What kinds? How long have you owned them?
   1.3 Do you own a smartphone or PDA that can access the Internet? Do you use it to access the Internet? What other electronic devices do you own?

2. Skill and use of IT
   2.1 How skilled are you at using computer technology to do the work required for your classes?
   2.2 Much is being said and written about the current generation of students using information technology extensively and being tech savvy. Do you think this statement is true of yourself? Of your friends?
   2.3 What kinds of technology skills are you weak in? What are you strong in?
   2.4 What kinds of technology skills do you think students in general are weak in?
   2.5 Do you think you have the skills you need for entry into the workforce? Are there particular areas that you think you’re most ready?
   2.6 Do you think you are Internet savvy?
   2.7 How are your skills in evaluating the reliability and credibility of online resources?
   2.8 Do you have a good understanding of the ethical aspects of using online resources?
   2.9 Do you use computers and the Internet for entertainment? If so, what kinds of activities do you engage in for entertainment?
   2.10 What impact do you think a student’s major has on his or her use and skills with technology?

3. Your use of technology in courses
   3.1 How have instructors used information technology in the courses you have taken thus far?
3.2 How effective are your instructors with these information technologies?
3.3 What are the major advantages that you see in the use of information technology in your courses?
3.4 What is the major disadvantage that you see in the use of information technology in your courses?
3.5 Do you think that the use of information technology in your courses has helped you in your learning? If so, how? If not, why not?
3.6 What are the major obstacles you see to more effective use of computer and information technology in your courses?
3.7 One of the findings of last year’s study was that students indicated that technology in their classes was about convenience. While improved learning was also mentioned, it seemed to play a lesser role. Can you please comment on this?
3.8 If there was one thing your professors could do or not do with respect to technology in your course, what would it be?

4. Future
4.1 What advice would you give university administrators who are keen to encourage the effective use of technology in college courses? What sorts of things should they be doing?

5. Social networking
5.1 Are you an active user of social networking sites (Facebook, MySpace, Bebo, etc.)? Why or why not?
5.2 How often do you use these websites? How much time do you spend?
5.3 Why do you use the websites? How do you use them?
5.4 How many friends on social networking sites do you have that you’ve never met in person?
5.5 These sites have been around for a few years. Do you think their popularity is increasing or decreasing? Why?
5.6 Do you participate (add content to) in wikis? How?
5.7 Do you participate (add content to) in blogs? How?
5.8 Have you used any of these social networking tools in your courses? How? How effective were they?
5.9 Are you worried about having your identity/profile available to everyone publicly? If so, why?

6. Other Comments?
### Appendix D

#### Participating Institutions and Survey Response Rates

##### Four-Year Institutions

<table>
<thead>
<tr>
<th>Institution</th>
<th>Carnegie Classification</th>
<th>Freshman and Senior Enrollment</th>
<th>Freshman and Senior Sample</th>
<th>Sample Percentage of Enrollment</th>
<th>Student Respondents</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona State University</td>
<td>DR EXT</td>
<td>23,698</td>
<td>5,900</td>
<td>24.9%</td>
<td>639</td>
<td>10.8%</td>
</tr>
<tr>
<td>Auburn University</td>
<td>DR EXT</td>
<td>9,681</td>
<td>1,455</td>
<td>15.0%</td>
<td>180</td>
<td>12.4%</td>
</tr>
<tr>
<td>Barry University</td>
<td>MA I</td>
<td>2,521</td>
<td>908</td>
<td>36.0%</td>
<td>163</td>
<td>18.0%</td>
</tr>
<tr>
<td>Baylor University</td>
<td>DR INT</td>
<td>5,795</td>
<td>1,600</td>
<td>27.6%</td>
<td>134</td>
<td>8.4%</td>
</tr>
<tr>
<td>Brandeis University</td>
<td>DR EXT</td>
<td>1,588</td>
<td>1,588</td>
<td>100.0%</td>
<td>645</td>
<td>40.6%</td>
</tr>
<tr>
<td>Bridgewater State College</td>
<td>MA I</td>
<td>3,927</td>
<td>3,927</td>
<td>100.0%</td>
<td>299</td>
<td>7.6%</td>
</tr>
<tr>
<td>California State Polytechnic University, Pomona</td>
<td>MA I</td>
<td>12,648</td>
<td>12,648</td>
<td>100.0%</td>
<td>896</td>
<td>7.1%</td>
</tr>
<tr>
<td>California State University, East Bay</td>
<td>MA I</td>
<td>5,083</td>
<td>4,100</td>
<td>80.7%</td>
<td>555</td>
<td>13.5%</td>
</tr>
<tr>
<td>Case Western Reserve University</td>
<td>DR EXT</td>
<td>2,023</td>
<td>499</td>
<td>24.7%</td>
<td>61</td>
<td>12.2%</td>
</tr>
<tr>
<td>Castleton State College</td>
<td>MA II</td>
<td>906</td>
<td>906</td>
<td>100.0%</td>
<td>92</td>
<td>10.2%</td>
</tr>
<tr>
<td>Catawba College</td>
<td>BA GEN</td>
<td>687</td>
<td>687</td>
<td>100.0%</td>
<td>56</td>
<td>8.2%</td>
</tr>
<tr>
<td>Central Connecticut State University</td>
<td>MA I</td>
<td>5,229</td>
<td>2,425</td>
<td>46.4%</td>
<td>174</td>
<td>7.2%</td>
</tr>
<tr>
<td>Central Michigan University</td>
<td>DR INT</td>
<td>9,532</td>
<td>8,759</td>
<td>91.9%</td>
<td>854</td>
<td>9.7%</td>
</tr>
<tr>
<td>College of Saint Benedict/Saint John's University</td>
<td>BA LA</td>
<td>2,102</td>
<td>2,102</td>
<td>100.0%</td>
<td>353</td>
<td>16.8%</td>
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<tr>
<td>Colorado College</td>
<td>BA LA</td>
<td>1,076</td>
<td>323</td>
<td>30.0%</td>
<td>72</td>
<td>22.3%</td>
</tr>
<tr>
<td>Coppin State University</td>
<td>MA I</td>
<td>1,655</td>
<td>1,655</td>
<td>100.0%</td>
<td>116</td>
<td>7.0%</td>
</tr>
<tr>
<td>Dartmouth College</td>
<td>DR INT</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>174</td>
<td>–</td>
</tr>
<tr>
<td>Drexel University</td>
<td>DR INT</td>
<td>6,861</td>
<td>1,716</td>
<td>25.0%</td>
<td>199</td>
<td>11.6%</td>
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<tr>
<td>Eastern Michigan University</td>
<td>MA I</td>
<td>9,001</td>
<td>2,250</td>
<td>25.0%</td>
<td>154</td>
<td>6.8%</td>
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<tr>
<td>Embry-Riddle Aeronautical University</td>
<td>OTHER</td>
<td>845</td>
<td>845</td>
<td>100.0%</td>
<td>439</td>
<td>52.0%</td>
</tr>
<tr>
<td>Embry-Riddle Aeronautical University—Prescott Campus</td>
<td>MA I</td>
<td>2,361</td>
<td>2,361</td>
<td>100.0%</td>
<td>213</td>
<td>9.0%</td>
</tr>
<tr>
<td>Embry-Riddle Aeronautical University—Worldwide</td>
<td></td>
<td>5,796</td>
<td>2,932</td>
<td>50.6%</td>
<td>391</td>
<td>13.3%</td>
</tr>
<tr>
<td>Emory University</td>
<td>DR EXT</td>
<td>2,600</td>
<td>1,750</td>
<td>67.3%</td>
<td>189</td>
<td>10.8%</td>
</tr>
<tr>
<td>Franklin W. Olin College of Engineering</td>
<td>ENGR</td>
<td>164</td>
<td>164</td>
<td>100.0%</td>
<td>64</td>
<td>39.0%</td>
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<tr>
<td>Granite State College</td>
<td>BA LA</td>
<td>438</td>
<td>438</td>
<td>100.0%</td>
<td>76</td>
<td>17.4%</td>
</tr>
<tr>
<td>Hamilton College</td>
<td>BA LA</td>
<td>918</td>
<td>400</td>
<td>43.6%</td>
<td>79</td>
<td>19.8%</td>
</tr>
<tr>
<td>Hofstra University</td>
<td>DR INT</td>
<td>4,117</td>
<td>1,500</td>
<td>36.4%</td>
<td>267</td>
<td>17.8%</td>
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<tr>
<td>Indiana University</td>
<td>DR EXT</td>
<td>13,415</td>
<td>700</td>
<td>5.2%</td>
<td>85</td>
<td>12.1%</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Institution</th>
<th>Degree</th>
<th>Method</th>
<th>Number</th>
<th>Percentage</th>
<th>Faculty</th>
<th>Grad Percentage</th>
<th>Grad Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana University-Purdue University Indianapolis</td>
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<td>9,280</td>
<td>700</td>
<td>7.5%</td>
<td>74</td>
<td>10.6%</td>
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<tr>
<td>Johnson State College</td>
<td>MA I</td>
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<td>923</td>
<td>100.0%</td>
<td>67</td>
<td>7.3%</td>
<td></td>
</tr>
<tr>
<td>Kansas State University</td>
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Appendix E

Bibliography

The bibliography contains all cited sources as well as additional material influential in preparing the study.


