perspectives for developing collaborative partnerships that enhance learning and success for first-year students.

CONCLUSION

"Collaborate or die...": that was the banner headline in a Business Week advertisement sponsored by the J. D. Edwards Company, which stated that collaboration is the key to profitability in the new economy. Although such a mandate would be met with dismay, and perhaps alarm, by members of the academy, many institutions have come to realize that the challenges they face, particularly those related to first-year student success, span many organizational boundaries and thus can best be addressed through a collaborative, cross-functional response. Faculty and student affairs educators must realize that they have a number of common enemies: unacceptable retention and graduation rates; chilly campus climates for students of color; increased incidents of incivility, academic dishonesty, and alcohol abuse; and unimpressive scores on national measures of learning productivity. All of these require a collective, collaborative response if they are to be addressed effectively. Indeed, successful interventions for combating these common enemies are based on the assumption that optimal student learning cannot occur if the central institutional components involved in that learning are separated from one another by structure or commitments or both (Kuh, 1996; Terenzini & Pascarella, 1994). By focusing on improving student learning and success, diverse stakeholders can be brought together to cocreate seamless learning experiences that integrate, in a comprehensive and coherent fashion, activities that foster educational attainment for first-year students and ensure the vitality of their institutions.

CHAPTER THIRTEEN

Technology and Today's First-Year Students

Reynol Junco

Monday, March 1, 7:30 A.M.: Beep . . . Beep . . . Beep . . . I reluctantly wake up. I search around in the dark for the snooze button, but I realize that my Palm Pilot is clear across my room—oh yes! I put it there last night to make sure that I get out of bed and make it to my 8:00 A.M. composition course. It's 7:30 A.M., just enough time to see who is on-line and to check my e-mail. I stumble over to my computer, which I leave on all night in sleep mode in case I receive any instant messages while I am dreaming of where I will go for spring break. Sure enough, Enrique, my best friend from high school, sent me an instant message last night asking if I had the new Outkast album on mp3. My away message instantly let him know that I was counting sheep. Checking Enrique's away message, I find that he went to sleep at 3:00 A.M. last night and that he is going to skip his 9:00 A.M. math class (not a great idea to announce if his parents check his away message). A quick check of my e-mail and I find five pieces of spam and an e-mail from my father reminding me to check my snail mail today to see if I received the money they sent so I can buy my goggles for biology class. It's now 7:45—I'm going to be late, so I throw on my jeans, t-shirt, a sweater, and my shoes and run to class.

Monday, March 1, 8:15 A.M.: My English professor is discussing the intricacies of run-on sentences and I find my attention waning. . . . My professor reminds us that our midterm paper is due this Friday. Oh no! I had forgotten to enter the due date in my Palm Pilot and I made arrangements to go home on Thursday and I haven't even started the paper! After class, I ask the professor if I can send it to her as an e-mail attachment since I will be away because of a family emergency (hey, it works every time!). She said she would accept it as long as she received the e-mail before 8 A.M. on Friday. Excellent! I can type the paper on my laptop.
while my sister drives home. Since I’ve got an hour before the next class, I run
down to the computer lab to start my paper. I fumble around in my backpack
for my JumpDrive—128 Megabytes of memory and where I keep all of my
important files. This is the best invention of the last few years—now I don’t
have to e-mail myself papers and/or worry about my floppy disks being corrupt.

Monday, March 1, 9:25 a.m.: While I am working with my JumpDrive, I open a
file to start my paper, and my cell phone rings. I check the Caller ID and discover
that it’s my mother calling from work. Mom reminds me to look for the check in
the mail today—I told her that I would and that I had already heard from dad via
e-mail. She also tells me that my sister may have picked me up a little later than
she expected because she is having a makeup exam on Thursday. I send my sis-
ter a text message to her cell phone to see when she can come to get me. I adjust
myself in front of the computer again. In addition to opening a file for my English
paper, I am checking my e-mail and have logged on to instant messaging. Enrique
is still sleeping, but Julian, my roommate, is online along with our friend from
down the hall and two of my friends from high school who attend the rival state
school. While I’m typing my introductory paragraph, Julian and our other friends
plan on meeting at the gym tonight. My friend from high school, Alyssa, IMs me
and asks if I saw the music awards show last night. Damn! I completely forgot
about it but luckily, Alyssa had already downloaded the whole show from a file-
sharing network. She promised she would send it to me later.

Beep, Beep. Beep rings my cell phone—a reminder to call Heather, Sejali, Tim,
and Jasmine to arrange a study session for statistics tomorrow. I’ll have to
snooze this reminder since it’s only 9:30 a.m. and I don’t think they are awake
yet. Better yet, I’ll send them a meeting request via e-mail! That way, I can check
their calendars to see when they are out of class and schedule our study session
at a convenient time for all of us. “Beep” chimes my Palm Pilot. Time to get to
my 10 a.m. history class. Instead of reading the 100-page-long chapter on the
important battles in World War II, I Googled the terms “important battles world
war 2” and found a great summary article written by a History professor at
Oxford. Wow! What a time saver! I should e-mail that professor thanking her
for making my life easier today. I also found a great Web site on the intricacies
of jet engines that included a paper that I could cite for my aerospace class, but
I have to be careful since my aerospace professor makes us use turnitin.com to
see if we plagiarized.

Monday, March 1, 10:05 a.m.: My history professor starts the class by logging on
to the workstation in the classroom and warming up the LCD projector. He also
announces that the notes and an audio transcript will be available on our univer-
sity’s portal Web page filed under his class information. Yes! I only wish that I had
brought along my laptop so that I could connect wirelessly to the portal, down-
load the notes, and add my own. My handwriting is terrible—I prefer typing any
day—it’s much easier for me to read. The only problem is that last semester, my
physics professor caught me IM’ing my friends who were already on vacation dur-
ing his lecture. Not good. For our next project, we are supposed to find a picture
of a World War II memorial and write a reaction paper. No sweat! I have some
pictures saved on my digital camera from my last trip to Washington. I’ll down-
load them tonight and add the appropriate text. He’ll love it! Time for lunch.

To those of us whose technology skills may be limited to word processing and
e-mail, this fictionalized caricature of a half-day in the life of a first-year student
may seem incomprehensible. To those of us who are more technologically liter-
ate and in tune with the many ways in which first-year students use technology
daily, this account may seem a bit over the top but nevertheless close to reality.

Today’s first-year students use the Internet and technology in ways that were
unknown to previous generations of students. Use of computers and the Inter-
net has increased dramatically across all subgroups of the students, and no
other group has seen an increase greater than incoming first-year students.
Traditional-age first-year students arrive at college with a comfort and under-
standing of computers and related technology that seems to be due, at least in
part, to their experiences with technology prior to college. Indeed, the State of
New Jersey reported in 1997–1998 that while only 36.5 percent of all secondary
public school locations had access to the Internet, 100 percent did in 2001–2002
(State of New Jersey, 2003). Furthermore, in a recent study of 276,449 first-year
students nationwide, 81.7 percent reported that they used the Internet for
research or homework during their senior year in high school (Sax et al., 2003).

Today’s first-year students, compared with their counterparts of previous
decades, are unique in their use of and familiarity with technology such as surfin
the Internet, instant messaging, e-mail, and cellular phones. Many professionals
who work with first-year students are unaware of the many ways those students
are using technology that may enhance or detract from their academic and psy-
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experiences with technology before college, including racial/ethnic minorities,
adult learners, women, and individuals from rural and lower socioeconomic status
areas. In addition, many faculty and staff members who are in their technological
knowledge and skill. These last two factors create difficulties for institutions where policies
assume that all first-year students and faculty have equal technological abilities.
Because of the fast pace of technology, some of the terms and specifications of
the technologies will change, but the point of this chapter will be the same: it is
important to understand that technology plays a major role, more so than
ever before, in first-year students’ academic and psychosocial development. Even
if technological terms and specifications change, there will always be a need for
first-year students to use technology for good (to express themselves, commu-
nicate, enhance their academic work, and build a sense of community)—and
they will sometimes use it for ill (to cheat, harass others, get addicted to com-
puter games, and isolate themselves from others).

This chapter examines the impact of technology on first-year students and
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how first-year students use technology, what those technologies are, how those
technologies affect their experiences, and what practitioners must do to inform
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first-year students about the use of technology, and help them use technology in positive ways. In this chapter I will provide definitions of technologies used by students, outline current research on technology and first year students, discuss the impact of technology on first year students, and offer recommendations for practice.

THE TECHNOLOGY

First-year and other college students use a wide variety of technological tools, including instant messaging (IM), electronic mail (e-mail), cellular phones, the World Wide Web, and file sharing.

Instant Messaging
This is a software program that allows individuals to communicate in real time, as messages are sent instantly to the screen of the other user. Using IM to communicate is often referred to as “chatting” because of its interactive and real-time nature, as if two people were talking face-to-face. Some of the more common programs are America Online’s Instant Messenger, ICQ’s messenger, Yahoo Messenger, Microsoft Network’s Messenger, and Internet Relay Chat. All are based on the same principle: users are shown a list of their friends who are on-line and available for chat. Users may then click on the person’s name and send him or her an instant message. The person on the receiving end of the message sees the message in the form of a box that pops up on the screen with a space to reply (Webopedia, 2003).

It is possible to run other applications while using IM programs; therefore, students may often work on a class assignment, write an e-mail to a professor, shop, and chat at the same time. Indeed, first-year students are quite adept at carrying on a number of IM chats at the same time. One first-year student reported to me that she chats with over twenty people simultaneously. She believed that this would help faculty members understand her ability to multi-task and the fact that she sometimes becomes bored in their classes because they do not move as fast as her virtual world.

The IM conversations in which first-year students engage rarely follow standard English grammatical rules. For instance, it is appropriate to use the letter “u” to mean “you,” to leave out articles, and to use acronyms for common phrases such as “brb” for “be right back,” “lol” for “laughing out loud,” and “ttyl” for “talk to you later.” In fact, I spend a great deal of time in my first-year seminar courses discussing how it is important to not write papers using grammar as if one is chatting via IM.

E-Mail
This software or Web-based service allows individuals to send asynchronous messages. Messages are typed using a text editor, sent, and routed through Internet servers to reach a recipient’s “mailbox.” The recipients must check their mail in order to see if they have any new messages. E-mail messages can be received at any time, as servers will save messages until they are checked. First-year students need not be at their computer to receive these messages, and they can also reply to them at any time. One important difference between IM and e-mail is that IM happens in real time while e-mail allows the student to think about a response. E-mail has been used as an effective tool by faculty and staff to communicate with first-year students (Webopedia, 2003).

Cellular Phones
Cellular phones allow students to make phone calls, browse the Web, send e-mails, and send text messages and photographs. With the advent of more affordable cellular phone handsets and calling plans that make long-distance rates less expensive than ever before, cellular phones have started to replace the traditional telephone land line. Many students use cell phones to stay in touch with each other, and more important, to stay in touch with family and friends. If students are lonely or homesick, they can reach into their backpack, grab their phone, and make a phone call. Some phones have incorporated IM technology so that students never have to log off and can receive real-time messages anywhere.

Cellular technology also allows for the use of wireless hand-held devices such as BlackBerrys and personal digital assistants (PDAs). Although only a few students are using these technologies at present, more reasonable prices and technological knowledge will likely lead to an increase in use (such as the increase in use witnessed with cellular phones). PDAs are hand-held devices that are used for data storage, scheduling, and some computer applications (such as word processing) that do not require a great deal of memory. They are mainly used to keep a schedule and to keep a list of contacts (like an address book). Some first-year students may use a PDA to store notes for their classes as they can be used as a digital notepad. PDAs can be connected to the Internet via cellular connections thereby allowing students to check their e-mail, surf the Web, and chat from anywhere. BlackBerry hand-helds are devices that are connected to the Internet by cellular connections and allow the user to send and receive e-mail anywhere.

World Wide Web
Many first-year students use the Web to perform research for classes, shop, check sports scores, check the weather, obtain stock quotes, play computer games, and do many other things. For example, it has been my experience as a faculty member that first-year students are much more inclined to use the Web to find research instead of using the library. Indeed, librarians are now making greater efforts to help first-year students in doing research in ways that are ethical and yield valid information (see Chapter Twenty). The Web also allows colleges and universities to provide courses and services such as registration, orientation, and fee payment on-line. At most institutions of higher education, first-year students can check their grades, view graduation degree audits, schedule classes, and pay fees using the Web.
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File-Sharing Software

First-year students use file-sharing software to download music, games, pictures, and so forth. Some of the more popular software programs include Kazaa and WinMX. These programs work by allowing a student to search a network of other users’ computers for files. When students find the file they are looking for, it can be downloaded onto their machine with the click of a button. File-sharing software has been in the headlines for several years, with federal courts issuing injunctions against Napster and, more recently, against individual users of file-sharing software for sharing large numbers of music files. Using file-sharing software influences first-year students’ view of intellectual property: many of them know that they are sharing copyrighted material but have not thought of the implications of doing so.

RESEARCH ON TECHNOLOGY AND FIRST-YEAR STUDENTS

Some research has been done on students’ use of technology and the impact it has on the student experience.

Use of Technology

Current first-year students use technology more than their counterparts from previous generations, and students in general use technology more than the general population. In addition to their experience with technology, research has shown that a large proportion of college students in general and first-year students in particular have used the Internet for communication and school-related activities (Pew Internet and American Life Project, 2002; Sax et al., 2003). Sax et al. (2003) reported that 84.5 percent of first-year students used a computer frequently and that 67.4 percent reported using the Internet for uses other than school research. Furthermore, Sax et al. reported that 64.1 percent communicated via e-mail frequently and 70.2 percent communicated via IM frequently. In a survey of 728 students taking courses that incorporated the use of technology, Shuell and Farber (2001) found that first-year students (as well as graduate students) reported using e-mail more than sophomores, juniors, and seniors did. The most popular use of technology reported was using e-mail to communicate with instructors, with a full 83.4 percent of students reporting doing so.

Researchers have found evidence for differences in technological preparedness based on factors such as gender, race, class, and academic background. For instance, Sax, Ceja, and Teranishi (2001) studied a sample of 272,821 first-year students and found that even after controlling for income levels, Latino and African American first-year students were less likely to communicate via e-mail than were white and Asian American first-year students. They also found that students who had higher academic aspirations (what they termed the “Scholar Typers”) were more likely to use the Internet and e-mail than other students. Furthermore, students who earned higher grades in high school and took more college preparatory courses were also more likely to use e-mail and the Internet.

Nationwide, more women than men report that use of the Internet has improved their relationships with friends and family (Pew Internet and American Life Project, 2003).

These research findings can be understood by looking at data collected by the National Telecommunications and Information Administration. In a nationwide study and document, Falling Through the Net: Toward Digital Inclusion (U.S. Department of Commerce, 2000), the administration reported that:

- Only 23.6 percent of Latino and 23.5 percent of African American households nationwide had Internet access compared to 46.1 percent of white and 56.8 percent of Asian American households.
- In urban areas, almost all groups studied had higher levels of Internet access than in rural areas: 23.9 percent for Latinos, 24.0 percent for African Americans, and 48.3 percent for whites in urban areas versus 19.9 percent for Latinos and African Americans and 40.9 percent for whites in rural areas.
- Internet use is a linear function of income, with those with lower incomes using the Internet at lower rates than those with higher incomes.
- Households earning more than $75,000 per year are highly likely to have Internet access.
- Only 33.7 percent of Latino and 32.6 percent of African American households had a computer as compared to 55.7 percent of white and 65.6 percent of Asian American households.
- Latinos and African Americans are less likely to use the Internet than Asian Americans and whites: 23.7 percent and 29.3 percent compared to 49.4 percent and 44.4 percent, respectively.

Along with the evidence for substantial differences in access to the Internet and computers, there are also differences in how individuals from minority, low-income, and rural backgrounds are encouraged to use computers. Brown, Higgins, and Hartley (2001), Pisapia (1994), and Milone and Salpeter (1996) have summarized research that found that students in public schools in lower-socioeconomic-status (SES) areas are more likely to be using computers for academic practice and quizzes, while students in the higher-SES areas were more than three times as likely to be learning how to program them. In other words, those in lower-SES areas are being controlled by the computer while those in higher-SES areas are learning how to control the computer. Furthermore, schools attended by students from minority or lower-SES backgrounds tend to provide less access to computers and related technologies, and when they do have computers, they are often located in areas inaccessible by students.

Differences in how women use the Internet have also been reported. The most recent data, provided in Cyberatlas (2002), showed that men logged on to the Internet more, spent more time on-line, and accessed more content than women, even though women’s Internet presence (numbers of individuals using the Internet) equaled that of men in the United States. Worldwide, Nielsen and
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RESEARCH ON TECHNOLOGY AND FIRST-YEAR STUDENTS
Some research has been done on students’ use of technology and the impact it has on the student experience.

Use of Technology
Current first-year students use technology more than their counterparts from previous generations, and students in general use technology more than the general population. In addition to their experience with technology, research has shown that a large proportion of college students in general and first-year students in particular have used the Internet for communication and school-related activities (Pew Internet and American Life Project, 2002; Sax et al., 2003). Sax et al. (2003) reported that 84.5 percent of first-year students used a computer frequently and that 67.4 percent reported using the Internet for uses other than school research. Furthermore, Sax et al. reported that 64.1 percent communicated via e-mail frequently and that 70.2 percent communicated via IM frequently. In a survey of 728 students taking courses that incorporated the use of technology, Shuell and Farber (2001) found that first-year students (as well as graduate students) reported using e-mail more than sophomores, juniors, and seniors did. The most popular use of technology reported was using e-mail to communicate with instructors, with a full 83.4 percent of students reporting doing so.

Researchers have found evidence for differences in technological preparedness based on factors such as gender, race, class, and academic background. For instance, Sax, Ceja, and Teranishi (2001) studied a sample of 272,821 first-year students and found that even after controlling for income levels, Latino and African American first-year students were less likely to communicate via e-mail than were white and Asian American first-year students. They also found that students who had higher academic aspirations (what they termed the “Scholar Type”) were more likely to use the Internet and e-mail than other students. Furthermore, students who earned higher grades in high school and took more college preparatory courses are more likely to use e-mail and the Internet.

Nationwide, more women than men report that use of the Internet has improved their relationships with friends and family (Pew Internet and American Life Project, 2003). These research findings can be understood by looking at data collected by the National Telecommunications and Information Administration. In a nationwide study and document, Falling Through the Net: Toward Digital Inclusion (U.S. Department of Commerce, 2000), the administration reported that:

- Only 23.6 percent of Latino and 23.5 percent of African American households nationwide had Internet access compared to 46.1 percent of white and 56.8 percent of Asian American households.
- In urban areas, almost all groups studied had higher levels of Internet access than in rural areas: 23.9 percent of Latinos, 24.0 percent for African Americans, and 48.3 percent for whites in urban areas versus 19.9 percent for Latinos and African Americans and 40.9 percent for whites in rural areas.
- Internet use is a linear function of income, with those with lower incomes using the Internet at lower rates than those with higher incomes.
- Households earning more than $75,000 per year are highly likely to have Internet access.
- Only 33.7 percent of Latino and 32.6 percent of African American households had a computer as compared to 55.7 percent of white and 65.6 percent of Asian American households.
- Latinos and African Americans are less likely to use the Internet than Asian Americans and whites: 23.7 percent and 29.3 percent compared to 49.4 percent and 44.4 percent, respectively.

Along with the evidence for substantial differences in access to the Internet and computers, there are also differences in how individuals from minority, low-income, and rural backgrounds are encouraged to use computers. Brown, Higgins, and Hartley (2001), Pisapia (1994), and Milone and Salpeter (1996) have summarized research that found that students in public schools in lower-socioeconomic-status (SES) areas are more likely to be using computers for academic practice and quizzesing, while students in the higher-SES areas were more than three times as likely to be learning how to program them. In other words, those in lower-SES areas are being controlled by the computer, while those in higher-SES areas are learning how to control the computer. Furthermore, schools attended by students from minority or lower-SES backgrounds tend to provide less access to computers and related technologies, and when they do have computers, they are often located in areas inaccessible by students.

Differences in how women use the Internet have also been reported. The most recent data, provided in Cyberatlas (2002), showed that men logged on to the Internet more, spent more time on-line, and accessed more content than women, even though women’s Internet presence (numbers of individuals using the Internet) equaled that of men in the United States. Worldwide, Nielsen and
CyberAtlas reported that the Internet population is predominantly male and historically has been male dominated. Research has also suggested that men may be more comfortable using technology for expressing emotional issues (Junco & Salter, 2004).

It is clear that there are differences along ethnic, gender, income, and geographical lines when it comes to familiarity with and use of computers and technology. Students with disadvantaged technological backgrounds attend institutions of higher education that place similar technological demands on all students. First-year students who are less prepared are also more likely to struggle figuring out how to do things that other students may take for granted, such as e-mailing an assignment to a professor, registering for classes, setting up their computer accounts, and figuring out how to use a computer to complete assignments.

In addition to ethnic, gender, income, and geographical issues, there are also striking differences in how first-year students as a whole use the Internet and technology compared to other individuals. Studies show that students use the Internet much more than the general population. The ongoing Pew Internet and American Life Project investigates the impact of the Internet on various sectors of society. One project study, The Internet Goes to College: How Students Are Living in the Future with Today’s Technology (2002), focuses on college students and the time they spend on-line. The study found that:

- 72 percent of all college students check their e-mail daily, while only 52 percent of all Americans with Internet access do so.
- 20 percent of today’s college students began using computers between the ages of five and eight.
- By the time they were teenagers, all of today’s current students had begun using a computer.
- 85 percent of college students own their own computer.
- 66 percent of college students use at least two e-mail addresses.
- 78 percent of all college Internet users stated that they went on-line to browse for fun compared to 64 percent of all Internet users.
- 60 percent of college Internet users have downloaded files on-line compared to 28 percent of all Internet users.
- 26 percent of college students use IM on an average day compared to 12 percent of all Internet users.

The same Pew survey asked college students questions about the academic benefits of using the Internet. They found that:

- 79 percent of all students reported that the Internet had a positive impact on their academics.
- 46 percent of students reported that e-mail allows them to express ideas to professors that they otherwise would not express in person.

- 19 percent of students reported that they communicate more with their professors via e-mail than in person.
- 73 percent of students reported that they use the Internet more than the library to search for information.
- 68 percent of students reported subscribing to an academic e-mail list (or listserv) related to their academic area.
- 65 percent of students reported absences by e-mail while 58 percent have used e-mail to discuss a grade with an instructor.

Impact of Technology

There are conflicting reports about how the Internet has an impact on students. The Internet may positively affect student interactions with each other and faculty members. For instance, Hu and Kuh (2001a) examined the responses of 18,844 college students at seventy-one institutions on the College Student Experiences Questionnaire (CSEQ). They found that attending a wired campus (that is, one that had more readily available Internet technology, as defined by Yahoo! Internet Life’s survey of most wired campuses) was positively related to students’ reporting good educational practices (student-faculty contact, cooperation among students, and active learning). Wired campuses did not reduce student engagement in good practices. In fact, students at more wired institutions reported more contact with their teachers and more peer interactions. Of interest was that older, nontraditional students did not seem to benefit as much from technology as their younger counterparts.

In another study using the CSEQ, Kuh and Vesper (2001) found that even when background characteristics and academic ability were taken into account, students who learned more about computers during college (“High Gainers”) reported higher gains on skills considered essential for success in college than those who learned less about computers (“Low Gainers”). The improvement in skills included gains in the ability to think analytically, ability to learn on one’s own, understanding oneself, and awareness of other philosophies. They also found that High Gainers spent more time studying than the Low Gainers did.

It is possible that the Internet may negatively affect first-year students’ academic progress as well as their interactions with each other and faculty members. Kubey, Lavin, and Barrows (2001) conducted a survey of 576 mostly first-year students and found 9 percent of the sample agreed or strongly agreed that they might be a “little psychologically dependent on the Internet.” The students in the “dependent” group were significantly more likely to agree or strongly agree that if they had a few more friends, they would probably use the Internet less than those in the “nondependent” group. There was a disproportionate number of first-year students in the Internet-dependent subgroup, and these students felt significantly more alone than other students.

In the Kubey et al. (2001) survey, 14 percent of the overall sample reported that their schoolwork had been hurt occasionally, frequently, or very frequently due to Internet use. Four times as many of the students in the dependent group
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In the Kubey et al. (2001) survey, 14 percent of the overall sample reported that their schoolwork had been hurt occasionally, frequently, or very frequently due to Internet use. Four times as many of the students in the dependent group
reported Internet-related academic impairment than did the nondependent group. The group identifying academic impairment reported usage more than double that of the whole sample. Also, a disproportionate number of first-year students in the group reported academic impairment. Those reporting academic impairment due to the Internet were significantly more likely to agree or strongly agree that if they had a few more friends, they would probably use the Internet less than those in the nonimpairment group. First-year students are apparently at greater risk of developing academic difficulties because of Internet use.

While Kubey et al. (2001) reported support for the idea of Internet dependence and its negative psychological and academic effects, other researchers have investigated the nature of this phenomenon and reported positive psychological effects of Internet use. In one study, Morgan and Cotten (2003b), using a sample of 287 first-year college students, found that increased e-mail and IM hours were associated with decreased depressive symptoms (as measured by the Center for Epidemiologic Studies Depression Scale–Iowa Version) while increased Internet hours for shopping, research, or playing games were associated with increased depressive symptoms. In other words, using the Internet for interpersonal connections promotes psychological well-being. Finally, Morgan and Cotten (2003b) found that increased e-mail and IM hours for men yielded a larger decrease in depressive symptoms than for women.

Whether the Internet has a negative or positive impact on first-year students’ psychosocial and academic development will be a subject for research and debate for years to come. One thing is certain: today’s first-year students are unique in that they use the Internet to communicate and keep a close group of friends through IM, chat, and e-mail. In addition, most first-year students maintain relationships with a group of high school friends by using the Internet, which is markedly different from previous generations of students (Kubey et al., 2001). In addition to keeping high school friends “with them,” they can also keep in touch with their family in ways that students might not have done before the advent of the Internet. In one study, the Pew Internet and American Life Project (2000) found that 31 percent and 34 percent of respondents reported that it was easier for them to say frank or unpleasant things over e-mail to family or friends, respectively.

A recent study found that first-year students spent an average of 16.3 hours per week chatting and using IM while spending only an average of 3.9 hours per week using e-mail (Morgan & Cotten, 2003a). The increase in popularity of instant messaging allows first-year students to deal with emotional issues and to be frank or unpleasant without having to deal with someone in person. These sentiments are echoed by comments made by students enrolled in my first-year seminar course:

As far as on-line disagreements go, I have had one with an ex-girlfriend. She was the shy type, really quiet about personal things. So because of this fact of her being unable to talk about things in person, I wasn’t able to find out she liked me and ask her out unless it was on-line. . . . [After a time] I finally had to end it since I knew she wanted to but wouldn’t. . . . Since I began attendance, I was able to find someone who can actually talk to me in person and on-line!

I told [my boyfriend] it was over. . . . I used e-mail and IM because it was easier. I knew if I did it in person it would be ten times more emotional and I would cry and I didn’t want to give him that satisfaction.

I used the e-mail to contact one of my professors, because I missed his class and he saw me the same day. I wanted to e-mail him to let him know why I wasn’t in class. The reason for choosing e-mail is because I did not want to explain face to face. Because it is harder to explain yourself in person rather than in writing them a letter, and in a letter to him you don’t have to answer questions.

It’s easier to say over IM because you can’t see their facial reactions that could upset you.

Other first-year students prefer face-to-face interactions, as evidenced by these comments:

I hate fighting or getting mad at people on-line cause when you or they say something you can’t tell their tone!

I really hate arguing on the Internet because it is so pointless. I believe it’s more respectful to do that kind of stuff in person.

Instant messaging has undeniably become an easy-to-use way of avoiding facing up to emotions and difficult interpersonal situations. But many first-year students reported building and maintaining significant interpersonal relationships using the Internet. First-year students use e-mail and IM to deal with the loneliness that comes with their transition to college. One important research finding is that Internet use driven by social needs positively affects psychological well-being, while Internet use driven by informational needs does not (Morgan & Cotten, 2003b). A student could use IM to build significant interpersonal relationships and deal with otherwise uncomfortable interpersonal situations as part of the trial-and-error learning necessary for developmental growth.

First-year students are able to use IM and e-mail to communicate with faculty and staff members in what is for them a nonthreatening environment. Instead of meeting faculty members in their offices to discuss a grade, a student can e-mail them and meet them “on their own turf.” In my experience, many students who otherwise would not have approached me after class or during office hours have used e-mail or IM to communicate ideas. Introverted students are more likely to ask questions about material presented in class over e-mail and IM because it reduces the pressure for a student to self-monitor and become anxious about asking in front of peers. In addition, IM allows first-year students to “check out” a professor to see if she or he is someone whom they can talk to.
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TECHNOLOGY AND THE CLASSROOM

In the classroom, students are required to create presentations using presentation software such as PowerPoint. They are also often required to use course shells such as Blackboard to supplement class instruction. Course shells have revolutionized distance and regular course delivery. These systems offer a virtual companion to a regular classroom or can serve as a complete virtual classroom. Many of today's courses include chat rooms where faculty members may create exams and students may log in, at their convenience, to take the examination. Course shells allow faculty members to hold on-line discussions and grade these discussions in much the same way that class participation might be graded. These shells also allow more introverted students to be more comfortable responding to questions posed by the professor. Furthermore, course shells allow for twenty-four-hour access to assignments, syllabi, news items, and frequently asked questions about the course.

Whereas course shells serve as a supplemental resource to existing courses, on-line courses are completely Web-based courses that have traditionally been geared toward distance education students. More recently, first-year and other non-distance education students are being allowed to take on-line courses that count toward their degree requirements. Both groups of students require support for their on-line tasks. The Western Cooperative for Educational Communications, which publishes a guide to developing on-line student services, gives recommendations, including having financial aid provide on-line loan entrance and exit counseling, providing on-line orientation services, providing advisees access to their own records through a comprehensive on-line advising system, having career services encourage students to build on-line relationships with potential employers, and developing an on-line forum for discussing typical student concerns with the counseling center (Western Cooperative for Educational Telecommunications, 2003).

There are specific technology demands for selected majors to which first-year students must adapt. For example, education majors must learn how to create their portfolios on-line, psychology and social science majors are adapting to collecting survey data on-line, and science majors must learn to use computer models in their laboratories. In addition to these specific demands, first-year students typically use the Internet to perform research for papers instead of going to the library. Most institutions offer on-line full-text journals where students can find all of the research they need from the comfort of their own rooms.

While the Internet makes it easier for first-year students to perform research, it also makes it much easier for them to plagiarize. Students can cut and paste information from thousands of Web sites and articles on the Internet. Because of the vast number of Web sites, it is often quite difficult to trace these instances of plagiarism. For instance, one of my former colleagues prided himself in finding on-line plagiarism. He would spend days performing search engine queries to find those who had cheated and would typically catch an average of eight offenders each semester. Furthermore, students can buy complete term papers from a number of sites that offer "college term paper help." These sites allow students to purchase actual term papers that are often guaranteed to get them an A. The papers can be downloaded and opened in a word processor and edited as needed.

There are few ways to prevent plagiarism through technology, but a small number of companies have produced tools to address Internet plagiarism. Most of these tools come in the form of software programs that check Internet databases for similarities. The most notable company offering an antiplagiarism solution is turnitin.com, which offers an automated method of checking students' work. Students upload their paper to turnitin.com, and the site's software automatically searches the Internet and its database of papers and provides an "originality report" for each paper that is submitted. Each submitted paper is added to the turnitin.com database, thereby reducing the probability of cross-institution plagiarism. Since the student uploads the paper himself or herself and the results are sent directly to the professor, such a service may be a deterrent for would-be plagiarizers.

Certainly, the ability to communicate effectively through writing should be an essential focus of any institution of higher education. One challenge for those who teach first-year students is the influence that technology has had on writing. Since incoming students more than likely have spent more time using IM than writing term papers, they are prone to write English in the same manner that they use during their IM chats. They are prone to include slang such as "u" for "you," "LOL" for "laughing out loud," and various other slangs. Furthermore, with more refined spell check algorithms come new difficulties with spelling. A common mistake that I have encountered is when students use the word "defiantly" instead of "definitely" because spell check replaces misspelled versions of definitely with defiantly. I make it a point to discuss the difference between the meanings of the two words during my first-year seminar courses and warn students about the fact that spell check makes that and other erroneous changes. I encourage students to proofread their papers carefully.

GAP BETWEEN FACULTY AND STUDENT
TECHNOLOGICAL KNOWLEDGE AND SKILL

While technology holds out much promise for enhancing first-year students' academic performance, the gap between faculty and student technological skill and knowledge can limit this promise. For example, while first-year students generally use e-mail and the Internet at high rates, faculty participation lags behind. The National Center for Education Statistics received responses from 882,000 faculty and staff who taught credit-bearing courses at degree-granting institutions (Warburton, Chen, & Bradburn, 2002). They found that:
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Certainly, the ability to communicate effectively through writing should be an essential focus of any institution of higher education. One challenge for those who teach first-year students is the influence that technology has had on writing. Since incoming students more than likely have spent more time using IM than writing term papers, they are prone to write English in the same manner that they use during their IM chats. They are prone to include slang such as "u" for "you," "LOL" for "laughing out loud," and various other slangs. Furthermore, with more refined spell check algorithms come new difficulties with spelling. A common mistake that I have encountered is when students use the word definitly instead of definitely because spell check replaces misspelled versions of definitely with definitly. I make it a point to discuss the difference between the meanings of the two words during my first-year seminar courses and warn students about the fact that spell check makes that and other erroneous changes. I encourage students to proofread their papers carefully.

GAP BETWEEN FACULTY AND STUDENT TECHNOLOGICAL KNOWLEDGE AND SKILL

While technology holds out much promise for enhancing first-year students' academic performance, the gap between faculty and student technological skill and knowledge can limit this promise. For example, while first-year students generally use e-mail and the Internet at high rates, faculty participation lags behind. The National Center for Education Statistics received responses from 882,000 faculty and staff who taught credit-bearing courses at degree-granting institutions (Warburton, Chen, & Bradburn, 2002). They found that:
• 97 percent of faculty had access to the Internet.
• 69.2 percent of full-time and 46.3 percent of part-time faculty used e-mail to communicate with students.
• 40.4 percent of full-time and 34.3 percent of part-time faculty used a course-specific Web site.
• Faculty spent an average of 2.7 hours per week responding to e-mail from students.
• 40 percent of full-time and 34 percent of part-time faculty used course-specific Web sites for their classes.
• 82 percent of those who used course-specific Web sites used them for general class purposes, 70.9 percent for homework information, 25.8 percent for practice exams and exercises, 22.2 percent to post exam results, and 80.6 percent for course-related links.

There are differences in the use of technology, at least in the academic setting, between faculty members and first-year students. For example, according to research by Sax et al. (2003) and Shue and Farber (2001), first-year students reported using e-mail to communicate with faculty more than faculty reported using e-mail to communicate with students (Warburton et al., 2002). Furthermore, first-year students use the Internet and surf the Web at much greater rates than faculty use the Web in their courses. One reason that faculty are not using the Web in their courses at similar rates to students is that using Web sites for courses and teaching courses on-line requires a different teaching style than the style used in a traditional classroom. Faculty, by virtue of the fact that they have not had the same exposure to technology as their students, generally require more training in adapting to technology (Roach, 2000).

The gap between faculty and students in technological use and comfort affects first-year students directly. Institutions require that students learn about and use a great deal of technology, especially in specific majors. Faculty who work with first-year students must ensure that students are receiving proper education in technological skills. It is also important for faculty to model appropriate and contemporary uses of technology. This way, first-year students have models that communicate the importance of improving their own technological skills.

THE IMPACT OF TECHNOLOGY ON FIRST-YEAR STUDENTS’ SENSE OF COMMUNITY

First-year students’ sense of community about their institution begins while they are still in high school, when they gather information about colleges and universities. Students form their first impression of an institution by visiting that institution’s Web site. The information that is found on an institution’s Web pages can significantly influence a student’s decision to attend. Furthermore, some admissions offices are using technology to provide prospective students the ability to engage in chats with faculty and other students, thereby allowing prospective students to gain a better sense of the campus environment. Institutions are starting to provide orientation sessions in an on-line format, which may also have an impact on a student’s view of the campus environment.

Remember that current first-year students are unique in that they use the Internet and cellular technology to communicate and maintain a close group of friends. This close group of friends includes contacts from high school since the distance between them is shortened through the possibility of IM, chat, e-mail, and low-priced phone service. This ability allows first-year students to build their own sense of community apart from the institution they attend. It could have a negative impact on the connectedness they feel and their involvement in campus activities at their institution.

RECOMMENDATIONS

Over the past fifteen years, technology has had an enormous impact on the first-year student experience, for good or for ill. The issue now is how to direct this pervasive influence so that first-year students will reap the benefits of technology, while minimizing its negative effects. Following are some recommendations in this regard:

• Level the playing field. For many institutions, the development of all kinds of uses of technology for first-year students has been and will be helpful to their transition to college. However, not all students have access to or the skills necessary to use available technology. Thus, institutions must first make sure that they provide a level technological playing field for first-year students. For example, not all first-year students have their own computer, so they must have access to campus computer laboratories. They also vary in their computer preparedness, so there must be opportunities to become computer literate through orientation programs, first-year seminars, and other efforts designed to promote their success. Institutions that rely on technology to communicate with and orient first-year students before they enroll must make sure that those without computer access or skills receive the same information as those with such access and skills.

To create a level playing field, institutions should first determine the level of first-year student technological knowledge and skill and use this information to develop strategies to bring all of them to the point where they can use technology to succeed both inside and outside the classroom. This assessment is particularly important for institutions that enroll racial/ethnic minorities, adult students, and others who may not have had the advantages of use of computers prior to their enrollment. Technological knowledge and skill may be just as important to assess as math or English skills.

• Use technology to enhance the orientation of first-year students before they enroll. At some institutions, it is possible, through the use of technology, for
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entering students to inquire about admission, apply for admission, gain acceptance to the institution, pay their tuition and fees, and register for classes without ever having contact with an actual human being. Moreover, there is also great potential for using technology to orient entering students before they enroll by creating opportunities for them to access the Web sites of student and academic services and programs, have e-mail communication with students and faculty, and engage in electronic chats with other entering students, upperclass students, and faculty on transition issues. Focused chatroom discussions with upperclass students on issues such as what a particular major is like, what on-campus residential living is like, opportunities for involvement in campus activities, or how to use technology to be more successful in the classroom can be very helpful to entering students. Furthermore, chatrooms with faculty can be used to initiate discussions about particular majors, how technology is used in conducting classes, and content-focused discussions on topics of interest.

- **Use technology as a major tool in orientation programs and services.** Here again, the use of e-mail, chatrooms, Web sites, and other means of electronic communication can be a valuable tool in orienting first-year students once they are enrolled. For example, accessing Web sites of student and academic services can be a user-friendly and effective way of educating first-year students about the many ways the institution can help them succeed. CD-ROMs on issues such as sexuality, alcohol and drugs, campus safety, diversity, and other important topics can be made available to entering students in addition to face-to-face programs on these issues.

- **Incorporate technology education into orientation programs.** While this education will be especially important for first-year students who lack technological access, knowledge, and skills prior to college, even those with prior technological experience will need to know about how technology is used at their particular campus. For example, all first-year students need to know how to use the Internet to search for information to complete assignments or write papers. They also need to know information about computer laboratories, software, where to obtain technological support, how to access and use e-mail, and other information. Furthermore, first-year students need to know more about electronic plagiarism and the ways in which institutions try to prevent it. For example, many institutions may have invested in software or Web sites that can detect when a student may have plagiarized assignments or papers. Also, technological copyright issues should be addressed in the light of recent legislation against the widespread practice of downloading copyrighted music. Often first-year students download both music and other software from the Internet and do not think about the consequences.

Finally, first-year students should be made aware that technology is a double-edged sword that can also be used in negative ways. I know of instances where students have become involved in harmful relationships as a result of IM communications. Occasionally students may become addicted to computer use, to the detriment of their academic and social development. And there are also instances where students have illegally hacked into institutional or personal computer files or software. Moreover, students may unknowingly commit plagiarism or violate copyright laws in using their computers.

- **Provide technology education to faculty.** There is a gap between faculty and student technological knowledge and skill, with many faculty lagging behind their students. Of course, every campus has Luddites who are determined not to let technology interfere with the traditional ways of doing things. I know of a few faculty who refuse to use e-mail, accept Internet Web sites as sources for papers or assignments, or even allow students to submit papers and assignments electronically. No one is suggesting that faculty be forced into the electronic age, but for those who do not use technology because of lack of skill and knowledge, programs that teach faculty how to use technology to enhance student learning should be offered.

More specifically, faculty can use technology for on-line office hours, focused chatroom interactions among students, providing feedback on assignments and papers, providing e-mail addresses for all students in each class, publishing faculty lectures on-line, conducting student research, posting grades so that students can have real-time, confidential access to their grades, and adjust their studying and help-seeking accordingly, to name just a few.

- **Encourage student and academic support units to use technology in the delivery and communication of their services and programs.** On-line student services Web sites often include features ranging from providing information to opportunities for self-guided interactions with these units. Also, first-year students could access on-line tutoring support for math, writing, and other skills by using a chatroom software program with formula and drawing capabilities, such as Yahoo Messenger. Students can log on to a chatroom and discuss math problems with a tutor in a virtual group tutoring session. On-line writing support can take the form of e-mailing papers to writing tutors and using Track Changes and Notes functions to provide feedback.

On-line student and academic support services may also be integrated by centralizing all services on a portal Web page, as illustrated by examples on the Western Cooperative for Educational Telecommunications Web site (http://www.wcet.info/projects/laap/index.asp). From a central Web page, first-year students can, among other things, register for courses; maintain an integrated calendar; set up appointments with faculty, staff, and advisers; and chat with faculty and staff.

Whatever is done with on-line student and academic support services, it is important to assess how each unit is using on-line services to support and communicate with first-year students. Recommendations from the Western Cooperative for Educational Telecommunications (2003) can be useful in considering the best methods for providing on-line student services.

- **Provide help for students who experience academic or psychological difficulties due to technology.** Some students may be academically or psychologically harmed by the use of technology. For example, Morgan and Cotten (2003b) reported that psychosocial difficulties such as depression in first-year students can be a function of how, more so than how much, they use the Internet.
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Students involved in using the Internet for noncommunicative activities seem to be more at risk for depressive symptoms than those students who use the Internet for communicative activities. Counseling and advising professionals must be prepared to help first-year students deal with problems associated with technology use and misuse.

CONCLUSION

Today's first-year students are unique in their familiarity with and use of technology. Nevertheless, there are categories of students who may be at a disadvantage because of lack of access to, knowledge about, or skill with using technology. Furthermore, faculty and staff often lag behind students in using technology in the collegiate setting. The challenge for colleges and universities is not only to try to enhance first-year students' educational experiences by providing up-to-date technology, but to make sure that no one is at a disadvantage because of their lack of access to technology prior to college. Creating a level technological playing field should be the first institutional priority. If this goal is not achieved, technology enhancements designed to promote first-year student success may have the unintended consequence of creating unequal educational opportunities.

Technology should not be used in ways that significantly reduce or eliminate human interaction. Personal face-to-face interactions between all members of the collegiate community and first-year students are still powerful and necessary tools in helping them succeed. No amount of technology can or should ever replace this fundamental aspect of the first-year college experience.

PART FOUR

CHALLENGING AND SUPPORTING FIRST-YEAR STUDENTS IN THE CLASSROOM

Although we argued in the introduction that first-year student success can be defined in many ways in addition to academic success, there is no question that, at least in terms of institutional standards, academic success is a precondition to all other definitions of success. Unless students maintain a C or better grade point average, they will not persist to graduation, regardless of how well they might have succeeded with establishing and maintaining interpersonal relationships, exploring identity development, deciding on a career, maintaining health and wellness, considering the faith and spiritual dimensions of life, dealing with diversity, and developing civic responsibility. To be sure, all of these tasks can be directly or indirectly related to academic success, but from an official institutional standpoint (with the possible exception of church-related institutions) they are less highly valued than earning acceptable grades and persisting to graduation.

Thus, providing a challenging and supportive classroom environment to all first-year students is critical to their academic success. First and foremost, classroom environments must challenge first-year students to learn and achieve acceptable grades. Of course, student academic success is limited if faculty are not prepared to use instructional strategies that support student learning. In Chapter Fourteen, Bette LaSere Erickson and Diane W. Strommer provide a blueprint for first-year student learning in the curriculum and classroom. Of course, faculty must be properly prepared to teach first-year students, and in Chapter Fifteen, Scott Evenbeck and Barbara Jackson discuss ways in which faculty can be developed to create classroom environments that enable first-year students to maximize their learning.