Technological innovations and applications are rapidly transforming our society. This transformation has touched almost every aspect of our lives and its impact seems to be accelerating. Bill Gates has said technology is the revolution about which we have no choice (Gates, 1995). Higher education has lagged behind many other sectors of society in the adoption of technology as an administrative, learning, and communication tool. This, however, is changing as external forces and internal adaptations are compelling the adoption of new technological tools to compete successfully with both other higher education institutions and the corporate sector, as well as meet the challenges of an increasingly computer literate student body. There are many examples of these trends:

- At California State University’s newest campus at Monterey Bay, one building is conspicuously absent from their blueprints: the library. The campus will instead rely on technology for information retrieval.
- The Western Governors’ University, with its cyberspace campus and virtual classrooms, has taken steps toward full accreditation. Many other campuses, states, and regions are developing “virtual” campuses and enrolling students worldwide.
- At a leading research university, it is now possible to inquire about and apply for admission, get admitted, accept admission, receive advising, and enroll for
courses entirely through technological means without ever talking to another human being, either face to face or by telephone.

All of these trends, of course, directly and indirectly impact student affairs. The nature of our work, our investment in face-to-face relationships, and our reliance on students being physically present on our campuses has made our adoption of technological innovations somewhat cautious. As with most technological changes, early adopters have shown the way and advocated for its use. Student affairs administrators, however, have many questions. "Is the technological revolution a journey to higher levels of human experience or a gigantic leap into the abyss of total mechanization of the human race? Or will it be neither?" (Upcraft and Terenzini, 1999, p. 1) It is clear that student affairs professionals will need to become more knowledgeable about the uses and limitations of technology as well as the influence it will have on students and their learning and development if we are to fulfill our obligations to future student generations.

In this chapter, we will discuss the larger context of the technological revolution and the impact of technology on student learning and the delivery of student services and programs. The "downsides" of technology will also be discussed. Finally, the implications for student affairs policy and practice will be reviewed.

Technology, Society, and Higher Education

We are now in a time of unprecedented change. Naisbitt and Aburdene (1990) assert that "new technologies have changed the importance of scale and location and extended the power of individuals" (p. 301). They describe how technology empowers individuals by connecting them with the world electronically. Naisbitt and Aburdene also assert that the truly global cities of the 21st century will be the smartest and not the largest. These themes of individual empowerment and global networks are echoed by Louis Perleman (1992) who describes the technological transformation of the late 20th century and ends with the optimistic idea that "the same technology that is transforming work offers the new learning systems to solve the problems it creates" (p. 50).

The relationship between learning, technology, and work is the central theme of the work of Davis and Botkin (1994). Their thesis is that since learning is now the work of most businesses, learning is too important to be left to traditional higher education organizations. Business and industry should take over much of what is called traditional higher education in order for American business and industry to remain or get competitive in the global economy. Dollence and Norris
The Handbook of Student Affairs Administration (1995) assert that the need for learning in the knowledge society is so great that not enough traditional institutions could be built to accommodate the need, but see a great opportunity for higher education to meet this need through the adoption of technology.

The debate outside and inside higher education has been intense. Few would argue that, on the whole, American higher education has been a success by most measures. That it is still one of America's most popular exports attests to its value. The question is the ability of higher education to respond to the opportunities and challenges presented by technology. Western Governor's University is one such response. Thirteen western states decided not to build additional campuses in the face of double-digit enrollment growth projections for the next ten years, but rather to create and offer entire degree programs to all students on-line. Daniel (1996) argues that this need for access to higher education is a worldwide problem and the only way to provide it is through alternative instructional models, including technology.

That this transformation of society and higher education will influence student affairs should be evident from the context provided. As the delivery systems and missions of higher education are influenced by technology, the profession and practice of student affairs will be greatly affected in many ways.

Comparing Traditional and Emerging Learning Models

In the traditional higher education and student affairs model, learning and campus are synonymous. The campus is essential because it is a place where the physical facilities—laboratories, libraries, classrooms, residences—are located; where faculty, students, and administrators reside. The dominant mode of delivery of education—the classroom and the lab—requires that groups of students and a faculty member be in the same place at the same time on a regularly scheduled basis over some period of time, usually a semester. In the new learning models (see Figure 12.1), the learner will have many more choices about the way in which learning occurs. The traditional classroom is now in competition with compressed video, the Internet, videotape, computer self-guided learning and simulations, interactive learning, and other technology-based learning environments. Because technology can mediate so many kinds of instruction, competency rather than in-class time is the measure of learning, the traditional academic calendar is obsolete, learning may be pursued on an individual basis, and the pace of learning is modified to meet learner needs.

Given these changes, the out-of-classroom environment also undergoes a radical transformation. The physical presence of groups of students in one place is no longer required and those students who do assemble on a campus will have
FIGURE 12.1 THE IMPACT OF TRADITIONAL AND EMERGING TECHNOLOGY ON STUDENT AFFAIRS (GOLDSMITH, 1992)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Traditional</th>
<th>Emerging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campus</td>
<td>Physical Place</td>
<td>Information Node</td>
</tr>
<tr>
<td>Teaching</td>
<td>Face to Face</td>
<td>Multiple Options</td>
</tr>
<tr>
<td>Programs</td>
<td>Campus Based</td>
<td>Student Based</td>
</tr>
<tr>
<td></td>
<td>Face to Face</td>
<td>Audio/Video</td>
</tr>
<tr>
<td>Small Groups</td>
<td></td>
<td>Computer Assisted</td>
</tr>
<tr>
<td>Student Development</td>
<td>18-21 Age Focus</td>
<td>Resources</td>
</tr>
<tr>
<td></td>
<td>Creation of:</td>
<td>Creation of:</td>
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<tr>
<td></td>
<td>Environments</td>
<td>Interventions</td>
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<tr>
<td></td>
<td>Experiences</td>
<td>Resources</td>
</tr>
<tr>
<td></td>
<td>Interactions</td>
<td>Options</td>
</tr>
<tr>
<td>Student Services</td>
<td>Campus Focused</td>
<td>Student Focused</td>
</tr>
</tbody>
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The Impact of Technology on Student Learning

Upcraft and Terenzini (1999) posit the increased reliance on technology in the classroom as one of the emerging trends. Even conventional courses are being impacted by available technology. Students are often required to search the Web in order to write papers or do class projects. Faculty members' expectations about the use of the most recent information are heightened by the availability of the Internet. In some cases, video conferencing is used to bring experts into class or to have discussions with students from other parts of the world. In some laboratory classes, advanced simulations are used to conduct chemical experiments, study anatomy, or practice world politics.

E-mail is used for students to communicate with instructors or with other classmates. Some faculty members are now establishing class "chat rooms" and class listservs that allow students to link to one another. Some faculty members are requiring students to use e-mail to submit papers and class assignments and giving students feedback in the same way.

Students are also taking courses by compressed video or satellite feeds. A faculty member may not even be in the same location as the students, but can see
and hear students in remote locations. E-mail connections, the telephone, and often, an on-site supervisor complement this technology and assure that students remain connected to the instructor and others in the class.

At the high end of the technology scale are course offerings on the Internet. These courses are often self-paced, have tests built in to allow the student to assess learning, provide learning resources, and permit access to an adviser or tutor to answer questions or solve problems. The student's need to interact with other students or even the instructor is diminished because of the support provided by the technology of the course. Nowadays, students may not only take entire courses on the Web, but entire degree programs as well (Van Dusen, 1997). The permutations are endless and are limited only by the creativity of the faculty and the availability of learning technologies.

These changes in the use of technology require changes in the skills necessary to become a successful learner. The active listening, note-taking, test-taking, and questioning skills of the traditional classroom may be of limited use in a technologically mediated environment. The technological learning environment, time management, software savvy, computer "comfort," personal motivation, and synthesis may be as important as skills required in a traditional classroom.

Perhaps more importantly, the relationship between the learner and the faculty member is changed dramatically, and each must assume different roles. In the traditional classroom, learning is operationally defined as a faculty member in the physical presence of many students at the same time, in the same place, over some sustained period of time, with the instructor as "expert" and students as mostly passive learners. With technology, all of these assumptions are challenged. Learning becomes a continuum in which the learner may choose what, how, when, and where to learn, and the faculty member becomes the manager of the learning experience. The oft-repeated expression that a faculty member's role shifts from the "sage on the stage" to the "guide on the side" is very trite, but very true in technology-based learning.

The Impact of Technology on Student Services and Programs

Technology has also entered nearly every facet of student life. Network connections from residence halls, campus computer labs, and students' homes allow them to access the Internet and other campus networks, and to search remote databases and libraries. We offer just a few examples:

- In career placement centers, students can link to employer Web pages for information about companies and jobs, place resumes on the Web, and present their credentials to hundreds of employers. They can formulate cover letters
or home pages, send them electronically to apply for jobs, and arrange for on-campus or on-site interviews. All this can be done from the friendly confines of their rooms or homes without any contact with campus placement services.

- As stated previously, at some institutions prospective students can access admissions information, apply for admission, accept admission, apply for financial aid, receive academic advising information, and schedule courses without ever talking to an institutional representative.

- In residence halls, students can create professional-looking posters using computer graphics, advertise programs on cable channels and Web sites, participate in chat rooms, access floor Web pages, and even hold virtual floor meetings.

- In the area of group educational programs, information that was formerly presented in person can now be offered through CD-ROM and other electronic media. Speakers can use advanced technology to demonstrate or visit remote places that bring even arcane topics to life.

- The use of integrated data bases allow student affairs administrators to provide access to students so they can review their tuition bill, examine financial aid data, find other students on campus, or search for a student organization of interest. We can create personalized letters inviting students to particular events based on an interest inventory and personal profile they provide at registration. This mass customization of contact with students permits more targeted creation and marketing of programs.

- In the personal development area, self-help sessions can be created on-line that help students prepare for tests, learn better study skills, manage stress, alleviate depression, or just plain relax.

- Cyberspace lounges and cafes are great new sources of entertainment and socializing which may expand students' social interactions. Compressed video technology or interactive chat rooms permit communication with persons who may be hundreds or thousands of miles away. For students away from home for the first time, communication with family and old friends can help ease the transition to college.

- In academic advising, students and administrators can keep track of academic progress through “degree audit” programs and create “what if” scenarios that allow students to test alternative majors or course sequences, freeing up advisers to focus on more personal issues.

- Students can access various forms of entertainment, from computer games to movies to television programs.

- Students with disabilities may access information and programs in the comfort of their rooms, rather than be challenged by campus physical barriers. However, accommodations must be made for those students whose disability may interfere with various learning technologies.
The list is almost endless, and because of the rapidly changing nature of technology, will be hopelessly out of date by the time this chapter is in print. The trend toward wireless computing expands these capabilities to anywhere the student happens to be. Research, communication, and entertainment are all available on demand (Uppcraft and Terenzini, 1999).

**Downsides of Technologies.** With all these exciting, potentially positive capabilities, there are some downsides to the influence of technology that must be considered if we as student affairs professionals are to continue to act in the best interests of students' academic and psychosocial development and create communities that are, according to Boyer (1990), purposeful, just, open, disciplined, and caring. These downsides may include:

- **Less face-to-face interactions:** Face-to-face interactions among students and formation of student groups may be diminished, and the development of common purposes and joint actions may be thwarted, thus inhibiting students' sense of community.
- **Less effective communication:** Instant communication does not necessarily mean better or more thoughtful communication. The impulse to write an e-mail message can give license to expression without reflection and could be damaging. Saying something abusive or unkind on e-mail may be easier than a face-to-face interaction. Anonymous e-mail messages may further accelerate the potentially harmful consequences of instant communication.
- **More academic dishonesty:** Technology may, in fact, make it easier for students to engage in plagiarism and other forms of academic dishonesty. For example, acquiring term papers on the Internet is relatively easy, and wireless communication can facilitate cheating on examinations. Further, it may be much harder to catch students engaged in electronic dishonesty, and to prove their guilt once charged.
- **A narrowed definition of an education:** Especially with technologically driven distance education, we run the risk of reducing education to knowledge transfer. A college education becomes a commodity and learning is purely instrumental, leading exclusively to vocational preparation. The idea that education develops the whole person (interpersonal development, civic responsibility, intrapersonal development, cognitive development, values development, and other traditional educational outcomes) can become diminished or totally lost in a cyber-education.
- **Endangered mental/physical health:** For some students, computers can become an addiction that takes over most of their life. Examples include checking e-mail every few minutes, playing video games incessantly, participating in multiple...
chat rooms, and surfing the Internet excessively. Although establishing relationships based on e-mail conversations can sometimes lead to positive face-to-face relationships, reports of stalking, physical threats, and invasion of privacy are not uncommon.

- **Economic bifurcation of the campus community:** Technology creates the possibility of creating technological “haves” and “have-nots.” Those who had access to computers prior to college and those who can afford their own computers will have an edge over those who have no experience with computers prior to college and who cannot afford them. Most often, this will result in putting poorer students at a distinct disadvantage, unless institutions focus on computer literacy programs and providing equal access to computers and computer technology to all students.

**Implications for Student Affairs Policy and Practice**

The following questions adapted from those posed by Upcraft and Terenzini (1999) must be addressed if we are to focus on the opportunities and challenges presented by the integration of technology into our higher education institutions.

**How Will the Philosophy and Goals of Student Affairs Be Affected?** From its inception, student affairs has been concerned with the development of the whole student—both their cognitive and affective dimensions. Indeed, a number of thinkers and writers in student affairs are calling for an end to the bifurcation of the student into “cognitive” and “affective” dimensions, arguing that student learning is an intricate web of experiences and consequences for learning that cannot be meaningfully disentangled. There are calls for blurring the boundaries between academic and student affairs, for collaborating across divisional lines and for integrating students’ in-class and out-of-class experiences.

Computer technology, however, has the potential to bifurcate rather than integrate. In an “asynchronous learning environment” with “anywhere-anytime learning,” not to mention “just in time learning,” what is to be the role of student affairs? How is the full development—psychosocial and cognitive—to be promoted in a purposeful, integrated, mutually reinforcing environment or set of experiences? It seems clear that computer technology may pose a significant threat to the goals and educational effectiveness of what Kuh, Schuh, Whitt and Associates (1991) have termed involving colleges, unless they are conceived in ways that will accommodate a broader conception of student learning. This means that student affairs must develop new ways to promote educational goals and effectiveness that take into account the technological reality of today’s campuses and student life. Will the goals traditionally espoused by student affairs (e.g. student development,
How Can Student Affairs Use the Positive Aspects of Technology While Minimizing the Negative Aspects? Evidence cited in this chapter should provide ample proof that technological innovation can improve service delivery, enhance communication, and facilitate student learning. The question then becomes how can student affairs professionals use technology to serve the best interests of students? First, we can make sure that all students have equal access to computer technology, particularly those who have been historically underserved by higher education: adult students, part-time students, commuting students, those students whose race/ethnicity is underrepresented, and economically disadvantaged students. Second, we can use technology to communicate with students, and “customize” our interactions with them without being restricted by time or place. Third, technology can enable us to make students more knowledgeable about the many resources available to them, and provide needed information when they encounter a problem. Fourth, we can use technology to make our services, programs, and facilities more efficient and user-friendly.

We must also minimize the downsides of technology. First, we must work harder at integrating technology into our effort to build student communities. Second, we must develop programs that make technology accessible to all and not just to those who are already computer literate and have computers. Third, we must revise our judicial policies to deal effectively with technologically based infractions such as illegal access, plagiarism, security breaches, use of institutional resources for private entrepreneurship, harassment, and other offenses. Fourth, we must not be left behind because we do not have adequate technological resources. We must have staff experts who monitor the latest technological developments, recommend computer hardware and software purchases, design local area networks (LANs), ensure accessibility to institutional computer networks, and provide other advice and consultation. Fifth, we must be knowledgeable about how different student learning styles are affected by different types of technologically mediated instruction. For example, some students may prefer the immediate feedback provided by a self-paced learning program, whereas others may need the interpersonal reinforcement that a traditional class provides. Finally, we must be advocates for the appropriate use of technology, ever vigilant to ways in which technology may not serve the best interests of students.

How Can We Insure that Technology Will Not Depersonalize the Campus and Reduce Student and Faculty Contact? A significant body of empirical evidence indicates that some of the most powerful forces in higher education are faculty mem-
bers and other students (Pascarella and Terenzini, 1991). According to Upcraft and Terenzini (1999) research consistently points to students' interactions with faculty members (inside and outside the classroom) and with peers as powerful, positive influences on a wide array of educationally desirable outcomes. Technology has the potential of reducing this powerful, positive influence. For example, what is the impact on the community? While academic planners and distance education staffs are busy designing new ways to apply technology, student affairs administrators often commiserate about the loss of community and depersonalization of interpersonal relations. This opposition is not useful. A more constructive approach is to understand these new applications and consider the positive as well as negative consequences. For example, a campus network can provide valuable new ways to communicate with students and may have the potential to "personalize" the environment by facilitating communication among students, between faculty and students, and between students and student affairs staff members. After the positive aspects are acknowledged, questions can be raised about community and interpersonal relations. The question is no longer "if" technology will affect community and interpersonal relations, but how and under what conditions? These questions are particularly salient in institutions where some or all students are studying at a distance.

Student affairs administrators can also encourage the creation of on-campus discussion lists and communication mechanisms that can bring faculty, administrators, and students together in useful but previously underutilized ways. For example, student affairs staff might publish their e-mail addresses in the student newspaper and invite students to use e-mail to discuss issues, share concerns, or provide feedback. The use of technology to assess student services and programs through needs and satisfaction surveys is just beginning to be tapped as a means of systematic student feedback.

How Does Technology Affect Our Mission? What Responsibility, if any, Do We Have to Deliver Student Services and Programs to Students Learning at a Distance? How Will these Services and Programs Differ from Those Offered in a Traditional Campus Setting? Increasingly, more and more students will spend part of their time engaged in field experiences away from campus or earn their entire degrees without ever setting foot on our campuses (Upcraft and Terenzini, 1999). How do we serve these students? Obviously, they will require different services and programs delivered in different ways. Unfortunately, in institutions whose mission is evolving to include distance education, students affairs has lagged behind in meeting these students' needs. If serving students at a distance is a major initiative, student affairs must determine how to provide student services and programs to those students. This means understanding the needs of these new learners and designing and assessing programs and services that meet those needs. As more customized academic programs...
are offered, student affairs must customize its programs and services. Even at institutions that choose to emphasize more traditional delivery of academic and student services and programs, there may be some instances where students are taking a combination of traditional courses and distance courses, and we must respond accordingly.

But this problem extends beyond revamping the delivery of student services and programs. It strikes to the heart of the way student affairs educates students. Traditionally, we have relied on intervening in students’ out-of-class environment to affect development and learning, which assumes face-to-face interaction of students, faculty, and staff over some sustained period of time in a particular place. And there is substantial evidence (Pascarella and Terenzini, 1991), that most educational outcomes (e.g., psychosocial development and even cognitive development such as content mastery and critical thinking) are as much a result of what happens in this out-of-class environment as what happens in the classroom. The questions then become, what is the out-of-class environment for distance learners? How do student affairs professionals educate students whose out-of-class environment is more likely to be work and family rather than peer and faculty interaction? This is perhaps technology’s greatest challenge of all for student affairs.

**How Can We Ensure that Students with Less Accessibility to Computer Resources Will Not Be Disadvantaged?** Louis Perleman (1992) argues that the term handicapped will be redefined by the development and use of new technology. The handicapped in the information society will be those who do not understand or use the new technology. The question of access is one of the most central to the discussion of the impact of technology on higher education. As discussed previously, technology has the potential to create “haves and have-nots,” putting the economically disadvantaged behind the technology curve.

A role for student affairs administrators is to ensure equitable access. Some institutions have determined that all students must have computers and have built that cost into tuition. Others require computers and provide generous financing packages, training, and support for student users. For those institutions not requiring computers, student affairs staff will need to advocate adequate public access to computer laboratories. Wiring residence halls for computer access does not help students who do not have the resources to purchase a computer. Inferior public computer laboratories do not make for an equal playing field. In addition to access, training must be provided that will enable those students who have little prior experience with computers to overcome computer anxiety and learn computer skills.

**How Does Student Affairs Keep Up with Technological Advances, and How Will They Be Funded?** This is perhaps the most important question of all: Is technology worth it? Technology costs a lot of money. It also has the potential of saving a lot of
money, although there is scant evidence that technologically proficient campuses have saved anything. The rate of technological change is stunning. New software is introduced almost weekly; new advances in hardware render previously very adequate computers inadequate; and the capabilities of the Internet expand constantly. The current wisdom is that hardware and software will need to be replaced every three or four years. How can student affairs administrators make these decisions within already tight budgets? We suggest that such decisions be made within the hardware and software policies of the institution, thus opening up the possibility of some combination of internal unit resources and institutional support. Among a number of competing choices, what do we decide to support from institutional budgets, what services should students pay for, and what services, although desirable, are not affordable?

After initial decisions are made, we must anticipate the need for upgrades and establish a phased repair and replacement schedule. One hopeful development is the information and computing power being transferred to the Web and to campus-wide networks. As this trend continues, computers that permit access to these networks or the Web need less power and the software is stored on the network and Web. Thus, network administrators can do updates and investment in hardware is minimized.

**Conclusion**

The technological transformation sweeping organizations is also affecting higher education. As this transformation progresses, student affairs professionals need to acquire the skills and knowledge necessary to use emerging technologies to design and deliver programs, enhance communication, and facilitate learning. This changing technology will redefine the environment in which we work, impact the policies and practices that govern our work, and demand that we, as a profession, engage in continuous learning about technology that will serve the best interests of students.

Our work environment will shift from the campus-based learner to the learner who may be thousands of miles away. Meeting learner needs in these various physical and virtual settings becomes the challenge of the future for our profession. It becomes even more critical that we define our learning outcomes and design ways of assessing those outcomes so that our services can improve. Our programs and facilities must then be redesigned to achieve those outcomes, using a variety of technological and traditional interventions. This approach parallels an emerging technological trend in academic affairs that measures learning outcomes rather than in-class time.

Perhaps most importantly, our own learning must change. Through our staff professional development efforts and academic preparation programs, we must
address the many issues identified in this chapter. How do we support students we never see, or see much less often? How can we build connection, awareness, and community in an institution that has multiple locations? How do we organize student affairs in these environments?

To date, there has been little discussion and even less research on the impact of technology on student learning and the implications for student affairs. We must align student services and programs with the missions of the institutions we serve. We must also advocate access to technology, identify for whom certain kinds of learning are most appropriate, and help find solutions to the administrative and learning challenges created by the increased use of technology in higher education.

References


