Student affairs practitioners must become experts at understanding how rapid changes in technology affect human development, relationships, and learning.

Values and Principles Guiding Technology Decision Making for the Future

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As futurists, student affairs practitioners can be campus guides and pathfinders for those who are fearful of, overwhelmed by, or even overly enamored with technological innovation. They bring a useful set of values, principles, and knowledge bases about human behavior in the context of higher education to serve as resources to move through this jungle of human confusion.

This chapter presents ways futurists have learned to examine the future. It explores several salient technological trends with implications for student affairs practitioners and concludes with principles that might be used to guide the choices and decisions to be made. Futurists are not content to wait passively or react only to imposed change. Futurists believe that if people can come to understand the meaning and consequences of trends, they can respond and redirect their actions to make more effective choices (Chase, 1984). Clearly, having a keen sense of one's personal and professional values and a clear view of the vision and mission of societal institutions provides the essential context within which these decisions are made.

The concept of the future has an air of mystery. Images of time machines, space stations, Star Trek characters, or life after a nuclear holocaust abound. For many of us, the future is when you are as old as your parents are now. Yet we each live all our lives in the future. The next five minutes of reading this page haven't even happened yet! Earl Joseph, editor of Future Trends (cited in Cornish, 1977), provides a useful taxonomy of five periods of futures time: "(1) Now: the immediate future (up to one year from now), (2) the near-term future (one to five years from now), (3) the middle-range future (five to 20

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years from now), (4) the long-range future (20-50 years from now), (5) the far future (50 or more years hence)" (p. 98).

It used to be that the impact or outcomes of the decisions made in the present would not be seen for many years. Futurists used to say, "The world that we will experience in five to 20 years is being shaped by decisions made now" (Cornish, 1977, p. 98). Indeed, part of our feeling that we live in times of chaos comes from the shortening of that loop, so that we see the outcomes of our decisions very quickly, often without adequate time to plan how to handle their consequences. Issues do not stand still long enough to resolve them; at best, we can shape them. Fortunately, in many cases, we exist in a type of parallel universe in that the events occurring on a nearby campus haven't happened on our campus yet, and we have a chance to learn from our colleagues' experience.

The study of the future is a type of 'applied history" (Cornish, 1977, p. 103). Futurists traditionally have used the principle of continuity or the principle of analogy to project futures scenarios (1977). The principle of continuity assumes that many things will continue to develop and progress as they do now-this leads to our examining some issues incrementally. The principle of continuity would indicate that even though technology will make distance learning possible, we still will, for example, have college campuses with people and buildings. Even though modems and fax machines have made it possible to work at home, there is still a need for meetings and face-to-face discussion'

The principle of analogy assumes that "certain patterns of events recur from time to time' (Cornish, 1977, p. 103). When something occurs, then a predictable outcome results. This when-then cycle helps anticipate possible future scenarios. For example, when there is a recession, then college enrollments typically increase. A declining job market consistently has brought more workers back to colleges for retraining or to pursue new career goals. Cycles are not unchangeable, however. Knowing the principle of analogy leads decision makers to intervene and conclude that the next time a when event hap- pens, it can be shaped to have a different outcome-a different then. So when there is such a technological breakthrough, then (using the principle of analogy) there are always some people who are early adopters ready to try anything and some fearful resisters ready to block anything. So a planner can foresee changes (for example, videoconferencing or paperless offices) and plan training programs, create policies to prevent misuse or plans to decrease the fearful resistance. Or when all residence halls are wired with direct Internet connections, then, along with such positive outcomes as enhanced information sharing, staff also can anticipate dealing with cocooning and obsessive-compulsive behaviors and plan helpful interventions.

Rapid change and complexity have made the principles of continuity and analogy incomplete as the primary tools for futures projections. Though helpful for some forecasting models, those strategies could be described in Newtonian terms as more linear, bounded, and controlled. in times of rapid

change-when events seem more unpredictable and messy, when a systems perspective of the whole is indicated, and. when connections and relationships become important elements--we should also include the quantum principles in chaos theory (Wheatley, 1992). Some quantum concepts, such as systems thinking, strange attractors of meaning, multiple realities, relationships and connections, and force fields (Komives, Lucas, and McMahon, in press; Wheatley, 1992), hold promise as guides to more effective futures forecasting.

The concept of strange attractors of meaning shows that seemingly random or diverse observations may actually have similar underlying patterns often understood by examining what values or beliefs might be involved. Using principles involved in relationships and connections, forecasters would not just keep adding the latest best technologies and expect everyone to use them eagerly. Principles of relationship and connections would lead to our asking a web of relational questions, such as, for whom is this technology an asset? *Who* will be distanced from this technology and why? Who should be involved in the decisions about what technology is useful for us in this con- text? What other systems here are connected or linked to this decision and should be included?

Current management practice is somewhere between Newtonian models (continuity and analogy) and quantum models (connections, wholes, and systems). We present both here to help you label which paradigm may be dominant in a specific context and perhaps move the system to a more quantum, connected view by asking different questions.

No one can truly see into the future. We can, however, anticipate and study the future by building on our reflections from the past and present. We weave that together with our knowledge of human characteristics and salient institutional factors to forecast and imagine our future. Futurists, therefore, use such techniques as building alternative futures, often called alternate scenarios. For example, assume a 10 percent increase in student enrollment (or a 20 percent increase, a 20 percent decrease) and develop models of staffing, fees, housing needs, sections of courses, and the like.

Futurists also do trend analysis or trend extrapolation (Merriam and Makower, 1988) to examine how some trends join with other trends, leading to issues that demand attention and need to be addressed (Chase, 1984). For example, if the federal government continues to restrict financial aid and if colleges increasingly depend on students owning personal technologies (for example, PCs) to be academically successful, then technological literacy becomes an access issue for students with limited economic resources.

It is safe to state that people will continually see technological marvels that change the nature of how they do their mental work. Yet "the most exciting breakthroughs of the 21st century will occur not because of technology but because of an expanding concept of what it means to be human" (Naisbitt and Aburdene, 1990, p. 16). Being human raises challenges; for example, bio-medical advances raise new questions about human life, and satellite television is moving people toward a global human rights agenda. Being human also

signals new questions that should be explored in the quantum model of futures forecasting. Student affairs practitioners are well positioned to pose the human questions that accompany any technological advance.

Trends for the Future

The United Way of America's Strategic Institute (1989) projects several trends (called "change drivers") about the future that have implications for post-secondary education and are influenced by changing technologies. Student affairs practitioners might study the implications of these change drivers for a particular campus or functional area (Komives and Woodard, 1996). These change drivers are (1) the maturation of America, (2) America's becoming a mosaic society, (3) a redefinition of individual and societal roles, (4) America's becoming an information-based economy, (5) increased globalization, (6) new forms of personal and environmental health, (7) economic restructuring, (8) redefining family and home, and (9) a rebirth of social activism. Some of these change drivers are shaped by technology and will benefit from and find solutions through technology.

Student affairs practitioners are encouraged to take any list of general futures trends (for example, Cornish, 1996; Mossberg, 1994; Naisbitt and Aburdene, 1990; Popcorn, 1996) and identify the multiple implications for each trend. Project alternative scenarios to get ahead of these trends and identify the actions to be taken now to shape the development of these trends.

Consider both the principles of continuity and analogy as well as the principles of chaos theory and ask, If this trend continues as it is developing now, what are the upside and downside implications? Or, If this trend continues and something else happens, what are the upside and downside implications? Or, How will this trend affect the whole system? What are the connections?

Consider the move toward electronic access to information. Principles of continuity would ask, If this continues, what will define cheating, or copyright infringement? Analogy asks, If electronic access is so available then will libraries carry CDS to check out or download? Quantum principles might ask, What other links should our Web site offer that would be of interest to those who access us?

Selected Student Affairs Implications

For some of the reasons previously discussed, it is difficult to predict all of the possible uses of technology in the near future. In fact, the rapid rate at which current technologies become obsolete makes future projections of limited use in a book of this kind. However, by focusing on some recent innovations and their immediate impact on the higher education scene, we hope to illustrate how technological change will test our values and assumptions. Furthermore, by examining the following brief vignettes, student affairs practitioners can learn to ask useful questions and to embrace the importance of connecting

decisions concerning technology to the underlying student affairs values and principles.

Universal Computer Ownership. The strategic plan for Futurist University states that by the year 2000, students will be required to have notebook computers when they arrive on campus. The new policy is predicated on the belief that the use of information technology for productivity (for example, e- mail, Internet access) and for pedagogical endeavors is essential to the university's educational mission. This multifaceted project anticipates the future of computer use **and** will create an environment for students and faculty to effectively use notebook computer technology at the university and apply that learning in their daily activities. The president has announced a 1 percent recision for all departmental budgets so that funds can be reallocated to achieve this important aspect of the university's strategic plan.

Futurist University's ambitious plan for universal computer ownership is not an altogether new concept. In fact, some campuses have been operating under a similar policy for the past few years. As colleges and universities move rapidly to provide Ethernet connections in their residence hall rooms and as technology becomes infused into the classroom, the case for universal computer ownership will intensify. Indeed, the ability to us@@ information effectively is a critical component of an education designed to create productive citizens. However, in. addition to considerations of necessary alterations to the infra- structure and of corresponding costs to the institution, there remain the fundamental questions of equity and of access to technology by students, faculty, and staff.

The information technology revolution has caught the attention of nearly every institution of higher learning. Campus funding has shifted dramatically to support the infusion of technology into virtually all aspects of campus life. Unfortunately, the competency of our students, faculty, and staff in the uses of information technology has lagged poorly behind the rate at which techno- logical advancements occur. The uses of technology and the funding to sup- port them have been distributed disproportionately to the sciences, where there already is an underrepresentation of ethnic minorities and women. According to a 1995 survey of information systems professionals (Cafasso, 1996), 70 percent of the information systems population are male. Given all of technology's virtues, the unfortunate reality is that it appears to present another wedge between the haves and have-nots. Futurists extend the twentieth-century implications of such economic concepts as the "haves and have- nots" to an equally perilous implication for the twenty-first-century information age, one of the "know and the know-nots" (Mayer and Gutierrez, 1996, p. 17).

The infusion of information technology on campus may detract from other important goals, such as the effort to achieve greater diversity and equity on college and university campuses. Because people of color have never been well represented in the information technology movement, the decision- making structures in higher education must be sensitive to the positioning of

competing goals and priorities. Even though much progress has been made in raising awareness on such sensitive issues, the speed with which information technology has risen to the top of institutional priorities may cause some institutions to lose sight of other important goals.

Student affairs practitioners generally remain committed to ensuring equal opportunity for students. Accordingly, as the voice for students, student affairs practitioners must ask the following questions of the administration at Futurist University:

Who will be disadvantaged (and advantaged) by a policy that requires universal computer ownership?

How can we ensure that women and people of color fully participate in the information revolution?

How will the university ensure access to the economically disadvantaged? How will universal computer ownership affect the mission of the institution and the student affairs role in enhancing and supporting the academic mission?

If we hold to the assumption and belief that students do not approach college with equal skill and sophistication, what interventions will be necessary to compensate for different levels of computer literacy?

Telecommuting. A housing assignments officer proposes to the director of residence life that he be permitted to work at home two days per week. The assignments officer contends that a majority of his work is done on the computer and that telecommuting has gained widespread acceptance in corporate America. With the recent automation of room selection and the ability to connect to the campus network by modem from home, it is possible for him to carry out his responsibilities without physically coming into the office. He further argues that his productivity will be enhanced by working without interruption.

The promise of telecommuting is a dream come true for anyone who lives near a major metropolitan area, fights traffic on a daily basis, or handles family responsibilities. Although the very nature of student affairs practice suggests that a staff member's physical presence on campus is essential, recent developments in technology, such as the creation 6f modem pools and voice mail, may simplify the process of conducting university business from remote locations. Future technologies such as wireless networks and high-speed modem connections will only make such access easier and-more efficient. Videoconferencing and interactive chat sessions also may make it possible for real-time and sometimes face-to-face communications with students and staff.

There can be many benefits to telecommuting. It eases the stress caused by commuting to work in highly populated areas, which often involves driving from great distances. Commuting long distances is sometimes necessary for dual-career couples who must work in different cities. Telecommuting also provides flexibility to the work schedule-an accommodation that could benefit families as well as people with disabilities. It also may enhance productivity, because employees would be able to work without the distractions that are typical in the traditional workplace.

A manager who is faced with a request to telecommute such as the one posed by the assignments officer may conclude too quickly that custom and tradition make such an arrangement too difficult. After all, 'we have never done it that way before.' In addition to such concerns as possible diminishing opportunities for human interaction in the workplace, a manager might wonder: How will I supervise and evaluate their work performance? How do I equitably address similar requests from others in the department? Will the delivery of services to students be affected (compromised or enhanced)? What will be the perception by various campus constituents of a telecommuting arrangement?

Student Learning Orientation. New Age College has revamped its academic mission to reflect a growing trend toward a focus on student learning and away from its prior focus on teaching. The vice president for academic affairs has called on the faculty to adjust pedagogy to incorporate new technologies into the learning process. The administration has adjusted its reward structure to encourage innovative learning methods, and has established a Center for Learning under the direction of the dean of the college of education. The Center has established a series of workshops for faculty describing the shift that needs to occur from the traditional focus on teaching to one that is concentrated on student learning. The change has been met with great resistance from faculty, who believe that the new direction proposed by the administration infringes on their academic freedom and focuses too much attention on the role of students at the expense of the traditional role of faculty at the core of the intellectual enterprise. Student affairs practitioners are both concerned and excited that the new emphasis blurs the line between the curricular and co-curricular that has historically defined their role on campus.

Clearly, new technologies will continue to influence the nature of education and services for the next century. The effects of technological change will be felt throughout the educational enterprise and will affect students from the moment they consider admission to a college and university-perhaps through the experience of virtual campus tours-until they graduate, reach alumni status, and become eligible for continued participation in the use of networked technologies. The extension of network privileges to alumni, K-12 educators, and other community members is gaining popularity and presents promise for inspiring goodwill among those important constituencies. However, the greatest impact of the uses of technology in the coming decade will be experienced in the classroom and throughout the learning process.

Higher education is in the midst of a movement that is forcing faculty to rethink the educational process--prompting educators to think in terms of "learner needs" as opposed to "teaching franchises" (Dolence and Norris, 1996; Massy and Zemsky, 1995). It is not coincidental that the arrival of the information age has necessitated the reevaluation of instruction. Furthermore, many

people predict that higher education will compete for learners with commercial firms and other learning intermediaries, a change that may require the rethinking of all degree programs and structures. Most of the present course offerings are provided by credentialed faculty and bundled together seamlessly in accredited institutions. 'A learning franchise, on the other hand, provides access to powerful learning systems, information and knowledge bases, scholarly exchange networks, with customizable teaming modules and systems open to anyone who needs them and can compensate the provider" (HEIRAlliance, 1996).

The challenge presented to higher education is clear, and the time to rethink our approach to delivering education and support services is imminent. The impetus for change in higher education is aptly summarized in the report Transforming Higher Education: A Vision for Learning in the 21st Century (Dolence and Norris, 1996). The authors conclude: "Society is undergoing a fundamental transformation from the Industrial Age to the Information Age. This is a global phenomenon with very significant local implications. All people, organizations, societies, and nations are affected, although not at the same pace or to the same degree. Those who realign their practices most effectively to information Age standards will reap substantial benefits. Those who do not will be replaced or diminished by more nimble competitors" (p. 2).

One way to illustrate the shift in thinking is to consider the performance indicators that are used to evaluate our institutions of higher learning. According to Dolence and Norris, in the twentieth century these indicators included administrative cost per FTE student, tuition revenue, various measures of incoming freshmen academic talent, graduation rates, parking spaces, and number of open-access personal computers. However, in the twenty-first century the important measurements will be the ability to communicate one-on- one with faculty, access to global information networks, access to unlimited library collections, flexible curriculum, network access from home or residence hall room, number of students with personal computers at home, and personal attention from faculty and mentors (Dolence and Norris, 1996, pp. 76-77).

The changing paradigm necessitated by the information age is perhaps not as radical for student affairs practitioners as it will be for faculty, who have not traditionally been focused on student needs. Student affairs practitioners have long identified that "each student is unique" and that students, as individuals, arrive with different "expectations, abilities, life experiences, or motives' (Plan for a New Century Committee, 1987, p. 10). "Networked information technologies, from simple e-mail to sophisticated linked multimedia classrooms, have unique potential to foster a student-centered learning environment where students can customize the learning process to their needs and faculty work more like coaches than lecturers" (HEIRAlliance, 1993).

The changes cited here are likely to be embraced by student affairs practitioners, as it has long been their belief that "student involvement enhances teaming' and "personal circumstances affect learning' (Plan for a New Century Committee, 1987, p. II). The challenge for student affairs practitioners will not be in embracing the change required by a new focus on student learning. The real challenge will be to reshape and assert the role of student affairs

practitioners in the change process. "The Student Learning Imperative: Implications for Student Affairs" (American College Personnel Association, 1996) provides useful information for understanding the changing paradigm, but it fails to identify the critical role that technology will play in furthering the learning agenda. In a student teaming-centered environment, the following questions should be considered:

What changes will be required of the "learning-oriented" student affairs division in the information age?

Will the distinction between curricular and co-curricular experiences begin to blur or disappear as technology enhances the opportunity for creating seam- less learning environments?

Will the focus on learning in the information age threaten or enhance the student affairs role on campus?

How will a learner-focused approach to education, facilitated through the use of technology, influence the personal development of students?

What opportunities are presented by new technologies for student affairs practitioners to work with faculty and academic administrators on a "learner-oriented" campus?

Principles and Recommendations

Anticipating the permanent whitewater of rapid change, Peter Vaill (1989) encourages leaders to work collectively smarter, work reflectively smarter, and work spiritually smarter. In working spiritually smarter, our values and beliefs (whether individual, institutional, or professional) become the rudder that steers us through this permanent whitewater. This is perhaps the essence of the quantum view. Decisions to be made about. applying technology and evaluating the implications of technology are best made in the context of clear principles and values.

The student affairs field has long been grounded in principles forming a culture and context for our work. Whether from 'The Student Personnel Point of View" (American Council on Education, [19371 1986) or the NASPA New Perspectives statement (Plan for a New Century Committee, 1987), common agreement exists on the principles that drive our practices in this field. These principles include the following:

- belief in the dignity, uniqueness, potential, and worth of each individual
- belief in the development of the whole person, including the importance of both thinking and feeling (American Council on Education, [19371 1986; Lloyd-Jones and Smith, 1954)
- concurrent belief in individuation and community (Young, 1996), recognizing the powerful role of community in learning and development
- belief that learning occurs in diverse places and in diverse ways.

Decisions about the use of technology and the consequences of technological Applications should be guided by these basic principles. These beliefs help

frame the questions that student affairs practitioners should promote when their campuses examine any technological advances.

Predicting the future of information technology in higher education is a difficult assignment. Developing an understanding of its impact on student affairs is an equally perplexing task. However, there remain some immediate. steps that student affairs practitioners can take to position themselves in a leadership role as their campus plunges forward in the information revolution. The following suggestions may be helpful for anyone who seeks to discover both the promise and the challenge presented by new technologies.

- Don't panic! If you feel that you are behind the eight ball when it comes to understanding and using information technology in your organization, you are not alone. The information revolution has taken higher education by storm, and it has been difficult for student affairs practitioners, especially for middle- level and senior managers, to bring themselves up to speed. However, students and new student affairs practitioners are coming to campus with an increasingly sophisticated understanding of the use of computers; their expectations will continue to grow as technology takes hold in education. Consequently, some further action on your part will be critical for you and your organization.

Take some time to immerse yourself in the technology in order to develop a better understanding of its uses on your campus. As an alternative (or in addition), hire staff members who come equipped with an appropriate level of computer literacy. Although student affairs practitioners would be advised to develop as much familiarity with technology as possible, everyone cannot be expected to be an expert. However, make sure that someone within the organization or a reliable outside consultant is available to assist when necessary.

- Consider an ongoing professional development program for you and members of your staff, one that is designed to include, among other things, training programs and opportunities that will contribute to your organization's effective use of information technology. An information technology overview is advisable for everyone initially and for new employees. Ongoing training that develops competency in the use of particular software applications, including the ability to search the World Wide Web, should be available to student affairs staff as needed. Check with your academic computing unit to see what training, if any, it can offer you.

- Remember to maintain an appropriate balance between electronic and other forms of communication (including face-to-face meetings and telephone conversations). The use of information technology for purposes ranging from scheduling meetings to exchanging information and ideas can lead to a more efficient use of resources, but there is no substitute for direct dialogue and the sense of collegiality that can result from more personal forms of interaction.

- Educate your staff and students about the legal, ethical, and responsible uses of information technology. At a minimum, ensure that your staff and students have received a copy of the appropriate campus policies that govern the use of computing resources. Formal training programs and other educational initiatives that reinforce ethical uses (for example, promoting the use of copyrighted software only after the appropriate license has been obtained) will go a long way toward setting clear standards for the employees within your organization and will present an excellent ethical model for everyone in your campus community, including students.

- Commit the necessary financial resources to fund ongoing purchases of hardware and software. Perhaps the most discouraging aspect of our pre- sent technological age is that innovations replace existing technologies, quickly rendering equipment obsolete. The initial investment seems significant enough by itself, but it is frustrating to learn that an enhanced model or newer version of the software is introduced almost as quickly as your most recent purchase arrives. Nonetheless, regular replacement and upgrades are commonplace, and student affairs departments must develop the funding infrastructure to replace existing equipment routinely. Leasing arrangements are likely to be available soon as an alternative to the ownership of equipment that becomes obsolete quickly and has little or no salvage value. Consulting with the information technology practitioners on your campus is an important first step before you set out to make new purchases.

- Consider how you can use the technology to enhance your professional network. Participation in listserv discussions has become a common means of conversing with professional peers and provides a great opportunity for expanding one's personal network. On the other hand, be careful in the selection of your discussion groups, and keep information nearby that explains how to get off a particular list when needed. You may find over time that the level of discourse- on a particular list does not meet your needs or satisfy your level of expectations. More commonly, some lists have so many subscribers that the volume of messages can be overwhelming, but through the use of digests and archives you can customize your listserv usage. Just as Internet addiction can become a serious concern for students, student affairs staff must use the technology in moderation.

- if you plan to establish a presence for your organization on the World Wide Web, careful planning and consideration of necessary resource expenditures should accompany your decision. Many departments within colleges and universities have rushed to develop Web pages and are encouraged to explore the possibilities presented by this recent technology. The cost for Web page development and maintenance should be considered carefully. The process of updating information to keep pages current is a frequently overlooked aspect of getting your organization and its activities onto the Web; no Web page may be better than one that is frequently out-of-date.

- Clearly, student affairs practitioners must become futurists (watch trends, scan the environment, re-frame perspectives, be open to new ideas). For example, regularly read the Cooperative Institute Research Program reports (Dey, Astin, and Com, 1991), which reflect freshmen attitudes and trends over a thirty-year time frame, and track the Almanac section of the September Chronicle *of* Higher Education each year. The Information Technology section of

the *Chronicle of Higher Education* also frequently contains information that can assist student affairs practitioners in anticipating future trends in higher education; it also reports incidents of computer misuse experienced by other institutions.

- Above all, ground all technological decisions in the principles and values of the student affairs profession and the mission of your institution.

Conclusion

Student affairs can become the dashboard of the institution. By using technology to tap student attitudes, track trends in student needs, and signal issues that need resolution, student affairs can establish the flow of information that is essential for enabling all divisions of the university to understand students.

Student affairs staff must use technology to become institutional leaders and educators who seek to facilitate, transform, and collaborate. Information is power-if the adage is apt; student affairs staff must set a standard that information be used to help, guide, and be shared in collaborative action.

Always remember, the majority of college students entering your institution in the year 2015 are already known; they were born in 1997 or before. We can track trends influencing the lives of these prospective students and forecast many of their needs and perspectives prior to their enrollment. The future is grounded in trends and events we see around us today. The challenge is to connect these trends to technology, as both change so quickly.

The quantum world tells us that student affairs practitioners must ask new questions. What are the advantages of this technology? For whom will it become a limitation? What are the consequences of abuses of this technology? How can technology be used to meet our primary mission, purpose, and goals? After all, "Technology should not determine how our mission is defined; our mission should determine how technology is used" (Pavela, 1996, p. 441).

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