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Administrative Strategies for Successful Adoption of Computer Technology

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STUDENT, faculty, and administrator attitudes toward technology can be enhanced when technology is used to make their lives easier, meet their needs, or solve their problems. Too often, technology has the opposite effect. Administrators will want to seek ways to use online resources to solve problems for students, faculty, and ultimately, themselves. Students may appreciate, for example, increased course flexibility, easier registration online, being able to check their personal records through a gateway, and filing forms online (Buchanan, 2000). From the student's perspective, online courses are attractive to people who have difficulty getting to campus, either due to lifestyle (e.g., single parents), distance from campus, disability, or work demands. Offering online courses extends the reach of education to people who otherwise may be unable to complete courses. From the faculty perspective, they will respond to recognition for their innovative online teaching and scholarship. Administrators should seek improved accountability, retention, accessibility, and enrollment. Everyone wins.

Every so often there is a staff or scheduling crisis that may lend itself to a computerized solution. If a faculty member is willing to teach online—whether totally online or simply using online support—that method of instruction can be used to solve problems. Consider these specific examples:

1. A faculty member has emergency surgery and needs to recuperate at home the rest of the semester. The instructor continues to teach class from home, "meeting" with students in an online discussion group during his regularly scheduled course time. The instructor receives, grades, and responds to student "papers" via e-mail.

2. A faculty member has two sections of the same course, but neither course is full. Rather than canceling both courses because of too few students, the sections are combined. Although some students only can attend during the day and others only can attend at night, both sets of students can post messages to a course bulletin board. The professor meets periodically face-to-face with both groups, but not every week with either group.

The students benefit from working on-ground some weeks with the professor and on-line every week with a regular-sized class.

3. A faculty member has an opportunity to travel on a special project for four weeks in the middle of the semester. The professor is scheduled to teach two courses that semester. Thus, the professor arranges the course schedule for face-to-face meetings at the beginning and end of the semester, and four weeks of online interaction while working abroad.

4. The department chair needs an adjunct faculty member to cover a class. A professor at another college is already teaching that course online. Although the chair only has a small stipend budgeted, the professor is willing to combine the classes at the two colleges.

5. Two professors at two colleges team-teach the same course simultaneously. When one travels to a conference, the other professor teaches both classes.

These are a few examples of the kinds of problems that may warrant a computer solution. When faculty see genuine value in computers, they may embrace a positive attitude. User satisfaction, for example is the most important variable in technological adoption, and faculty need to feel satisfied (Gallion, 2000). Attending a conference where faculty can learn about online work from experts, receiving a cash bonus for a job well done, being included in the decision-making process, and hearing the persuasive argument of a valued opinion leader are other strategies that may improve faculty reception. When administrators carefully strategize—through planning, providing technical and pedagogical support to students and faculty, recognizing and rewarding faculty effort, being realistic, encouraging faculty collaboration, integrating technology with traditional approaches, and spending wisely—they may be able to achieve the success they seek through computer technology on their campus.

Often, administrators discuss computer-assisted education and online instruction with enthusiasm, in the belief that technology will save money by enabling faculty to teach more students. In fact, online instruction typically requires fewer students than traditional teaching and is more expensive than traditional teaching; the equipment and software costs can be staggering. And, most faculty would rather teach in traditional modes than use the time and work intensive methods of online instruction, particularly if their colleges fail to reward faculty for working with technology. Many faculty are reluctant to embrace computer technology for teaching and scholarship. Cravener (1998) identified several major barriers to successful adoption and use of computer technology:

1. Institutional norms often fail to value technological skills.
2. Faculty give only marginal status to distance education in academe.
3. Reward structures devalue online work.
4. Faculty may experience anxiety caused by technological problems and role changes for faculty.
5. Faculty may hold myths about the value of technology and online instruction.
6. Faculty may experience anxiety over their inability to keep up with the speed of changing information and skills.
7. Faculty may expect technology to make their lives easier when, in fact, it makes life more complicated.

We agree with Cravener's observations and have noticed four influential paradoxes affecting the use of online technology in higher education:

1. For faculty, more freedom equals less freedom.
2. For teaching, more work is perceived as less work.
3. For learning, more accessibility leads to less human touch.
4. For administrators, desire for less spending causes more spending (Shedletsky

& Aitken, 2001). The purpose of this article is to give administrators a perspective from the standpoint of professors who are not "techies," but have been involved in the infusion of technology. We base our perspective on readings, discussions with colleagues, and our observations and experiences at two very different universities.

WHAT ADMINISTRATORS CAN DO

1. Plan

A 1998 survey showed that two thirds of colleges failed to strategically plan their technological implementation (Buchanan, 2000). Administrators will want to seriously participate in strategic planning so that technology fits with other goals and expectations in the college or university. Further, they need to involve faculty in the planning process to ensure that decisions are appropriate and that faculty feel invested in the process. We know, for example, a university that hired a new chief information officer (CIO) who spent his professional life as a veterinarian. The CIO's decision-making and poor planning infuriated faculty because as someone who never worked in higher education—never taught, never conducted research, never encountered educational politics—the CIO's decisions continually thwarted faculty needs. Although this example is extreme, we have encountered relatively few CIO's who have worked in the various capacities influenced by the position, and few who adequately involve the diverse points of view needed to plan for meeting the needs and perspectives of all interested parties (e.g., administrators, technical experts, students, faculty scholars, and concerned teachers).

Not only will administrators want to carefully select, train, and use their information technology leadership, they need to consider if and how various units or other campuses will affect college operations. Administrators need to know whether there will be mandatory central policies in operation. We know one state system, for example, where the administrators at the flagship campus has certain policy controls, and they refuse to install certain virus detection software, while prohibiting other computer services personnel from installing what security measures they consider most necessary. The result is an onslaught of e-mail viruses from the flagship campus that plague all campuses through the system address directory.

Logically, one would think that the closer the computer access and control is to the individual faculty member, the better because top administrators may centralize without seeing the value of local control and decision-making. Centralization can remove decision-making from the people who are affected most. Important variables in success seem to be faculty satisfaction, control, and direct access, which enable faculty the freedom to be creative and productive in ways they need and understand.

Planning for effective online distance education gives students more choices. Some reputable colleges are offering degrees online. Duke University's Fuqua School of Business, for example, has designed an MBA program that combines onsite lectures and online courses (Rogoski, 1996). eCollege.com offers 100 online degrees for students and universities participating in online distance learning; their services are designed to help colleges. To meet the demand of students who cannot wait for a particular college to develop the online instruction they desire, entrepreneurs are offering programs of instruction. With only two full-time faculty members, for example, Jones International University became the first accredited noncampus institution (Martin & Samels, 1999). Students can and will learn online, so administrators will want to plan carefully so the process happens successfully on their campuses.

Administrators place little emphasis on creating a climate that encourages planning which enhances morale (Kezar, 2000), elements that we consider mandatory for

effective organizational communication. Strategic leadership is far more crucial than administrative detail, and we believe administrators need to take a more proactive role in campus leadership rather than simply reacting to the constituent demands from above and below. Consider, for example, the kind of planning the North Carolina Community College system has used regarding technology. They used the following strategies in their planning process:

1. Redefine the funding model for technology and technical staff
2. Use technology to reach under-served students.
3. Educate administrative, regulatory, and accrediting barriers to the effective use of technology at the colleges.
4. Increase the use of technology to redefine delivery systems.
5. Use technology to better serve business and agency partners.
6. Provide more technology training.
7. Develop a communication infrastructure to support distance learning and remote access to resources. (Cooley, 1999)

Finally, administrators will want to give careful thought to who is involved in the planning process. They need to cut through the power politics of their campus and involve the most appropriate people for effective decision-making in the planning process.

2. *Provide Support*

"In the online world, courses are expensive to develop and even more expensive to support, and students need both academic and non-academic support" (Johnstone, 2000, p. 30). Administrators will want to offer solid technical and pedagogical support to students and faculty. Too often students and faculty are made to feel alienated by impatient and patronizing computing services staff. Plus, the effects of computer mishaps can be staggering enough to cure any reasonable faculty member of wanting to work online. What does a professor do, for example, when teaching online and the server goes down during an online exam? How much time can faculty afford to spend learning computer hardware and software? What professor wants to spend class time teaching technology before being able to teach the regular course content? Who wants to receive student papers as e-mail attachments that contain a virus? How often have faculty been given hardware or software that is not quite what they want or need?

Technology use can be overwhelming, so both students and faculty need strong support for using technology. When equipment or connections fail in the middle of a class session, faculty need backup systems and support staff who can solve the technical problems. Technical staff need to inform students and faculty of system limitations, so when depending on a PowerPoint presentation, for example, students and faculty can count on smooth operation on the available equipment and software. Broken blinds that enable too much light in the classroom for clear computer projections need to be fixed. The relentless day-to-day operational challenges of online instruction require a financial commitment to hire helpful staff, maintain facility space, and provide appropriate hardware and software. This support for students and faculty is essential for success (Simerly, 1999). Further, faculty development programs about technology tend to focus on how to operate technology, when faculty also need ideas about how to integrate the technology to improve teaching (Herr, 2000, p. 28).

Administrators need to establish faculty development programs that teach teachers how to teach. Very few faculty have had formal training in how to teach, so they may not be aware of the diverse teaching strategies they could use to improve their instruction to all students. And when it comes to technology, the job of learning technology is something most faculty have to find time to teach themselves. As Moore, Knuth, Borse, and Mitchell (1999) explained, accountability and technology trends are fueling the compe-

tency standards for teachers. These same kinds of standards are appropriate for the college level. If administrators want to be accountable, it is crucial that faculty be taught how to use technology in their teaching (Strickland, Salzman, & Harris, 2000).

Technology empowers students: "The magic of computer-enhanced learning is that the student can become the lead actor" (Brown, 2000, p. 28). But neither students nor faculty will feel empowered if they are constantly dealing with problems unrelated to the content they are trying to learn or teach. Students and faculty need to feel confident that their computer use will not turn against them. Computing services need to provide effective security for all users, for example, because security problems tend to become more serious and unresolved with the passage of time (Long, 2000, p. 12).

The loss of control over content and instruction is a viable concern for faculty. Courseware—such as Blackboard or WebCT—can help in grading and student tracking or it can be a nightmare of lost time and information. Administrators will want to be sure that classroom decision-making processes remain with faculty because administrative courseware decisions can control and limit faculty.

3. Recognize and Reward Effort

Faculty may wonder: "Why are faculty begged to take part in online work, then punished for doing so?" We have noticed a concentration of young and older faculty who are leading online uses in higher education, which if true, an explanation may be that young faculty may be unaware of the detrimental effect online work can have on their prospects for tenure and promotion, while older faculty are already at the professorial level, so have less to risk. Online teaching and scholarship is tricky for faculty because their peers and supervisors may feel suspicious or devalue their online work. While some administrators and colleagues tell faculty who conduct online academic work that they are pioneers, others claim online publications are less valuable than paper publications, that teaching via computer warrants more students in the course because the process is so easy, that teaching with Internet resources is less rigorous than using a textbook, and that online instruction creates an artificial and impersonal relationship with students. Sometimes faculty and administrators who never have tried online instruction think the online teacher is "just playing with the computer" or deserves an increased workload because the faculty member "doesn't have to meet with students like the rest of us" (Waldeck, Kearney & Plax, 2001).

For success, administrators will want to create a climate that recognizes that preparing online instructional materials and teaching with technology is hard work (Brawner, 2000) and online scholarship can be quite comparable to other forms of scholarship. Summerhill (1997) argued that online publications actually share many similarities with the traditional process, except online publications undergo greater peer review:

In fact, a very strong argument can be made that a hypertext document will undergo far more scrutiny in its lifetime than the vast majority of traditionally printed documents ever will. In the traditional model of publication, an author may circulate draft copies of a work to colleagues for comments prior to submitting the work to a publishing house. In fact, the practice of peer reviewed literature in the WWW may be made considerably more easy by the ubiquitous nature of the network. It is far easier to disseminate copies of the material to one's peers, assuming of course they have access to the network to begin with. In addition to targeted peer review, it is also much more likely that a hypertext document

in the WWW will receive consideration from interdisciplinary researchers outside the domain of knowledge of any particular author. (para. 24)

Colleges and universities need to incorporate fair ways to evaluate online scholarship and teaching in their promotion and tenure procedures. Until that happens, administrators can set clear rewards for faculty who use technology (e.g., cash incentives, ownership of course materials, granting royalties for use of materials, release time). We know of one college, for example, that encourages faculty to use university facilities to reap the rewards of entrepreneurial relationships with private industry, and the innovations on that campus are flourishing.

Students and faculty need to experience benefits from their online work in order to feel motivated to contend with equipment problems, program glitches, and adaptation requirements. Online instruction requires different student skill and motivation than onground instruction. Online instruction may be less available to low-income students, and as with other forms of individualized instruction, there are high drop-out rates in online courses (Marcus, 1999). As one administrator said of the faculty who developed technology-driven courses: "Only the hardest of faculty were willing to try to develop and deliver first-rate courses" (Tulloch, 2000, p. 58).

4. Be Realistic

If administrators fail to meet the growing technological demands, outside vendors probably will. The question of "Should we teach online?" has been replaced by "How can we effectively teach online?" As a success strategy, administrators will want to maintain realistic expectations and appropriate status for distance education and technological pedagogy. Now, more than 2 million college students are learning by distance education (Tulloch, 2000), which accounts for 15% of all students in higher education (Everhart, 2000, p. 51).

How do administrators and faculty deal with the pragmatic day-to-day operations of online demands? In some cases, for example, experts recommend a student cap of 75% of what is typical for the traditional classroom because distance learners require more individual attention from faculty. In other cases, faculty are given the "equivalent of a two-course load for each multiple delivery format course they teach" because technologically-driven courses require enormous faculty investments in time, preparation, and learning (Zirkle, 2000). In fact, some colleges charge higher tuition for courses and degrees taught solely online (Young, 2000).

5. Encourage Collaboration

Few faculty have content-specific knowledge for a course, time to review courseware and online instructional materials, computer design expertise, computer-mediated communication proficiency, command of effective online pedagogy, understanding of system configurations, and knowledge of the various software and hardware needed for online success. Typically, multiple people are needed to cover all the elements of effective online work, leading us to the conclusion that a positive organizational climate is crucial to successful use of computer technology.

Creating a positive culture allows individuals to adapt better to change or to voice their concerns about what is taking place. In addition, if change does not take place immediately, the institution will be better off than before (certainly no worse) by having created such a positive cul-

ture. Interestingly, a culture that fosters communication, collaboration, and reflective practice will most likely result from the use of those same elements to initiate change within the culture. (Robinson, 2000, p. 55)

Unfortunately, when faculty team-teach, co-author articles, and work as a team to complete a project, they often receive proportionately less credit than when they work alone. Too often competition beats collaboration in higher education, which works against technology adoption. Eaves (1997) put it this way: "Collaboration is about lots of things besides the division of labor, like reassurance in the face of technical panic" (paragraph 8). In addition, because distance education has always been on the fringe of acceptability in higher education, new media methods which effectively provide distance education are bound to be viewed as suspect (Lesh & Rampp, 2000). Thus, perhaps one of the strongest arguments in favor of collaborative instruction is credibility; faculty and administrators see that a check-and-balance system exists under the name of team-teaching. The rewards for teaching with technology have been minimal, so faculty have been motivated by interest and curiosity, while their colleagues express concerns about their quality of instruction (Husmann & Miller, 1999). With no financial or promotion rewards for the extra work, collaborative teaching can provide a reward in and of itself, acting as a motivational stimulus that helps faculty learn technology. Faculty have traditionally fought to protect their turf, but technology is requiring an interdepartmental and interdisciplinary approach. A faculty member who wants to create a computerized course needs friends in the computing services department.

Successful adoption of technology may depend on compatibility, enhanced value, perceived benefits, adaptive experiences, perceived difficulty, and suppliers' commitment (Au & Enderwick, 2000). In fact, user satisfaction and promotion by opinion leaders are necessary to successful adoption and diffusion of innovations (Gallion, 2000). Administrators may be most successful in identifying opinion leaders--not necessarily department chairs--among various faculty groups who have positive attitudes toward technology and can mediate development processes.

Collaboration with groups outside the college is also essential. Faculty will want to own their work, but the multiple parties involved in digital instruction complicates the matter (Maxell & McCain, 1997). Administrators will want to clarify whether courses will be owned by individual instructors, the institution, the vendor, or some combination. Not only may administrators need to work with vendors in creating and maintaining technological solutions, but they need to work with local communities. In a Kellogg Commission survey of state governors, 83% thought students should be able to "receive their education anytime, anyplace through technology, and 77% thought that collaboration with business and industry should be required in developing relevant curricula" (Von Holze, 2000, p. 57).

6. Integrate Technology with Tradition

It is time to stop making a distinction between technological and traditional teaching and scholarship because the online versus onground paradigm is outmoded (Tulloch, 2000). Technology needs to be well-integrated with traditional approaches, not treated as something unique or alien. Research already has demonstrated the importance of nonverbal communication and verbal immediacy in distance education, for example. The findings imply that online instructors need to find ways to demonstrate a relaxed interpersonal style, expressiveness, humor, warmth, involvement, and clarity via the computer text-based mode of delivery (e.g., Comeaux, 1995; Freitas, Myers, & Avtgis, 1998; Guerrero & Miller, 1998; Waldeck, Kearney & Plax, 2001; Witt & Wheelless, 1999). Online instruction generally needs to be used in combination with other methods (e.g.,

face-to-face, phone, fax, snail mail). Although some educators have experimented with distance learning and individualized instruction for decades, only now does computer-mediated communication offer a realistic system for delivery (Berge & Collins, 1996).

7. Spend Wisely

The financial implications of technology require serious consideration. We are not saying that administrators should avoid investing in technology, but that they will want to weigh the merits of their purchases and involve their people. We have observed, for example, upper level administrators who decided to purchase hardware and software for a given department which was not the most appropriate type and ultimately purchased double the technology because faculty needed something different. We know of a technology classroom, for example, which was completed just three years ago. The technological problems and inadequacies of the lecture hall were such a waste of money that administrators decided to gut the newly remodeled room and redo the classroom for another \$300,000. US colleges and universities spend over a billion dollars annually on computer hardware alone, and nearly two billion on software, or an average \$1 million a year for each US college or university ("Year 2000," 2000). Administrators will want to ensure that money is spent wisely, while remembering that the time and resources spent on technology inherently takes time and resources from something else. The last thing any administrator needs is wasted or doubled purchases.

In addition, how will the expense of technology affect faculty morale? We know one college that told faculty there would be specific monetary incentives for teaching through technology, but administrators never delivered on their promise to faculty. How will faculty feel watching administrators increase faculty work loads without compensation? What happens to faculty motivation when administrators tell faculty there is no money for faculty salary increases, yet spend a fortune on technology?

Technology is expensive. The expense is not just hardware and software, but includes the cost of new staff and technical support, faculty development costs, and faculty incentives. We know one colleague, for example, who serves on a board supervising a facility where each classroom costs \$200,000. Right now the facility is seldom used and the classrooms will be out of date before administrators provide the money to train faculty to use them. Unless administrators budget for the training and support process, their faculty will not be able to keep up with changing technology. Spending money on a helpful staff technical expert, for example, may be far more valuable than purchasing the latest equipment. Unless administrators budget for faculty incentives, faculty will be reluctant to take on the risk and extra work of teaching online.

CONCLUSION

We propose that administrators keep a small number of critical ideas before them as they make decisions about computer technology in higher education. These are:

1. Plan: Involve faculty in the planning process.
2. Provide support: Offer solid technical and pedagogical support to students and faculty.
3. Recognize and reward effort: Create a climate that recognizes that preparing online instructional materials and teaching with technology is hard work and online scholarship can be comparable to other forms of scholarship.
4. Be realistic: Maintain realistic expectations and appropriate status for distance education and technological pedagogy.

5. Encourage collaboration: Typically, multiple people are needed to cover all the elements of effective online work, leading us to the conclusion that a positive organizational climate is crucial to successful use of computer technology.

6. Integrate technology with tradition: Concentrate on student accessibility, retention, and satisfaction measures so there is less discontent about what is going on in higher education.

7. Spend wisely: Technology is expensive. The expense is not just hardware and software, but includes the cost of new staff and technical support, faculty development costs, faculty incentives, and more.

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