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ABSTRACT

To address the increased technological demand in education and the accompanying need for human and technical resources, a task force of four graduate students performed research to make recommendations for technology support staffing at Miramar College in San Diego, California. This technology support plan primarily focuses on personnel issues and addresses organizational structure, personnel, support and training, and costs. The task force undertook a mail/telephone survey of 10 community colleges similar in size to Miramar College to determine their levels of technology and staff support. Charts of five of the colleges were then developed for comparison. Analysis of the literature review and survey data resulted in the formulation of a series of recommendations for staffing and technological support. The task force confirmed that the visions and goals for technology of the District and the College were aligned by reviewing their respective strategic plan proposals. Recommendations include: (1) centralizing information technology; (2) hiring six additional personnel for technological support, including a coordinator of computer services, a hardware specialist, and an instructional specialist; (3) incorporating opportunities for personnel to enhance their technological skills; and (4) conducting a more thorough salary review to determine appropriate salaries for new personnel. Contains 31 references. (YKH)

Staffing for Technology in the Community College

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STAFFING FOR TECHNOLOGY IN THE COMMUNITY COLLEGES

Abstract

There has been much discussion of the potential for technology to change education for the better. In California, technology is mission-critical for community colleges. The state of California and the individual colleges have made a large commitment to funding increased technology, but at what cost? Locally, community colleges are struggling to keep current and to provide students with developing technology.

"Initial hardware and software expenses are not the major costs of integrating technology into the curriculum" (Syllabus, 1997). A major portion of the expenditures will come in the form of increased personnel costs. Unless scrupulously researched and planned for, initiating increased technology could result in a subsequent technology support crisis. It was the purpose of this task force to undertake a portion of this research to formulate a plan for technology staffing and make recommendations for supporting technology at these institutions.

This technology support plan primarily focused on personnel issues. Four areas we addressed are

1. **Organizational Structure:** Where does instructional technology fit within the organization's structure?

2. **Personnel:** What personnel are required to meet the technology needs? What are their title and their job descriptions?

3. **Support and Training:** How will staff be motivated to incorporate technology into their curriculum and instruction? Will incentives be offered? What levels of training and support are required and how will they be provided?

4. **Costs:** What costs are associated with staffing for technology?

Although our exploration of the literature and the resulting recommendations could be considered apropos for any community college of approximately 6,000 full-time equivalent students (FTES), we, at the request of Dr. Louis Murillo, President of Miramar College, tailored our recommendations to this institution.

Miramar College has grown significantly in its use of technology over the past few years. The number of computers on campus has tripled in the past two years alone. This trend is expected to continue. While technology has grown, the infrastructure for supporting the technology has not kept pace. Support staff is extremely limited.

The task force undertook a mail/telephone survey of ten community colleges similar in size to Miramar College to determine their levels of academic technology and the available staff support. Interestingly, the data showed that most of the responding schools have between 800-100 fairly newly acquired computers. Functional charts were then developed as a way of displaying and comparing the data from five of these community colleges: College of the Desert, College of the Sequoias, MiraCosta, and Shasta-Tehama-Trinity, and Waubonsee, plus Miramar College. Utilization of a combination of the information gleaned from the literature review and survey date resulted in the formulation of a series of recommendations for staffing and technological support.

The San Diego Community College District's *Strategic Directions for Information Technology and Conductivity Plan* (1994) was studied and aligned with Miramar College's own *Visioning 2000: A Strategic Action Plan* (1997). The relationship between these two documents is summarized in the body of the report. By linking the two plans, alignment between the District's and the College's vision, mission, and goals as they related to technology could be

assured. Recommendations were formulated in the four areas previously mentioned: organizational structure, personnel, support and training, and costs.

The task force recommendations are as follows:

1. We recommend that Miramar College centralize information technology, headed by a Dean of Information Technology, who will report to the College President. (See Figure 2).

2. We recommend the hiring of six additional personnel, in addition to the two people already on campus dedicated to technology support, to support growing technology needs. These positions should include:
    - Coordinator of Computer Services
    - Hardware Specialist
    - Software Specialist
    - Computer Technician (currently staffed)
    - Coordinator of Academic Technology
    - Instructional Specialist
    - Support Specialist
    - Network Specialist (currently staffed)

3. We recommend that Miramar College incorporate a variety of opportunities for college personnel to experience the use of technology and to enhance their skills in its use. A list of fifteen suggestions is included in the report.

4. The task force undertook a cursory salary review of four community college staffing sources, and we recommend that Miramar College conduct a more extensive salary review to determine appropriate salaries for these newly proposed positions. Additionally, we recommend that the College seek external funding and investigate a variety of cost reduction strategies.

This task force consisted of four graduate students who thoroughly researched the issues of increasing technology in the community colleges. The full report contains a strategic outline to assist Miramar College as they further investigate the challenge of integrating a more sophisticated educational technology system into their institution.

STAFFING FOR TECHNOLOGY IN THE COMMUNITY COLLEGES

Introduction and Statement of the Problem

Introduction

During the 1980s, many community colleges began to embrace technology. Attractive pricing, increased power and convenience, and enhanced user-friendliness of desktop computers paved the way for faculty to transfer much of the workload associated with preparing class materials to personal computer desktop systems and word processors. Even those faculty who did not consider themselves "computer users" found ways to use the new technology to ease the work associated with such tasks as preparing and modifying syllabi from semester to semester, creating audio-visual aids and handouts, and maintaining class rosters and grades.

The beginning of the next decade saw a shift from technology being used simply to produce output to being used to gather and disseminate information. In 1991, *Fortune* magazine reported that corporate spending on information technology surpassed corporate investment in manufacturing technology and declared that the Information Age had now replaced the Industrial Age. This transformation has opened up a whole new world, particularly to education. Most of the students entering the community colleges today have been exposed to computer technology, either during their years in elementary and secondary school, on their part-time jobs, or in their homes, both to collect information and to prepare reports based on that information. The new age of information is also evident in the shift of the majors that students select. The past five years has seen an increase of 91% in the number of associate degrees earned in the field of communications and a 21% increase in computer information services; the overall increase in degrees was 19% (Chronicle Almanac, 1997). Students' enhanced computer literacy and their

technology expectations create an imperative for the colleges they choose to attend to keep up with their abilities.

Statement of the Problem

This imperative to meet students' technology expectations and to prepare them for a workforce increasingly dependent on technology has left many colleges scrambling. The same faculty who have grown accustomed to creating output on the computer now must find ways to take full advantage of technology to ensure that their colleges remain competitive with other institutions, to enhance the teaching and learning that occur at their colleges, and to prepare students for the labor market. Meeting these requirements is not as simple as purchasing more computers for students and faculty, although this was the first response to the problem. Now, it is clear that the next step must be to support the growing use of technology.

The first requirement for a college is to determine the role of technology in its delivery of instruction. Will all learning be technology-based? Or will only certain sections of specific courses utilize a new technology? Will students be required to communicate with faculty and classmates electronically? Will Web searches be a course requirement? Must computer applications, such as word processor, spreadsheets, and presentation packages, be used, as appropriate, for every class? Will such distance learning techniques as video conferencing and Web-based instruction be used? Why is technology being considered? Is it hoped to increase enrollments or decrease instructional costs or to prepare students differently for the labor market? Once a college has determined its reliance on technology, it must address the issue of personnel to support the technology. It becomes important for a college to develop a technology plan that

encompasses both the physical hardware/software/media issues and the personnel support issues. The focus of this report is these personnel issues.

Although the personnel issues are interrelated, there are four distinct areas to be considered:

1. **Organizational Structure:** Where does instructional technology fit within the organization's structure?

2. **Personnel:** What personnel are required to meet the technology needs? What are their titles and their job descriptions?

3. **Support and Training:** How will staff be motivated to incorporate technology into their curriculum and instruction? Will incentives be offered? What levels of training and support are required and how will they be provided?

4. **Costs:** What costs are associated with staffing for technology?

Literature Review

The integration of advanced technology into higher education opens the door to many exciting possibilities that are just beginning to be explored. In an era when society is experiencing global economic growth and increasing demand for postsecondary education throughout the world, technology can provide worldwide access to that education. Philip J. Palin states that as recently as 1995 it was not possible to provide students meaningful information and guidance via computer in the way it can be done today -- anytime from nearly anywhere. This is due to the development of the World Wide Web, Web browsers and the proliferation of broadband communication. The Internet will deliver an increasingly available virtual university as technology becomes more easy-to-use and affordable (Palin, 1997).

Sir John S. Daniel (1996), in a speech given to the AAHE National Conference, stated that technology provides the key ingredients for university renewal: lower cost and unique attractions. He suggests that the "mega-university" is the best model of postsecondary education for the future. This university has at least 100,000 students and teaches at a distance allowing lifelong learners to study whenever they choose. Daniel favors an approach in which students can access lesson materials at any time instead of the more traditional video-conferencing approach to distance learning. This gives the student the most freedom and flexibility in learning. There are at present eleven mega-universities enrolling 2.8 million students compared to the 3500 colleges and universities in the U.S. which enroll 14 million students (Daniel, 1996).

Exploring another technology possibility, Clayton and Floyd Colleges in Georgia have issued laptop computers to all their students. The benefits to these community college students are access to the Internet, e-mail, the World Wide Web and a statewide library system which

provides flexibility and versatility. Through this access, students gain skills in the use of information technology. Programs of this type have been implemented in several other states. While it is still too early to judge the academic benefits of such programs, it is anticipated that computers will continue to proliferate for the foreseeable future (Cartwright, 1997).

In spite of the nearly universal enthusiasm about incorporating technology into education, there has been criticism of some aspects of the technology issue. For instance, there is concern over the emphasis of one technology in postsecondary education instead of a "multi-technology approach" (Russell, 1977, 4). Thomas L. Russell believes that students' learning styles must be taken into account and incorporation of older technologies, such as radio, television and videos should not necessarily be discarded since they may better serve some students than the latest technologies. He criticizes educators who embrace high cost technology when low cost technology may work just as well.

California State University at Monterey Bay has also been criticized despite its lofty goal of merging technology, multiculturalism and hands-on learning. The University has been accused of offering a watered-down, feel-good curriculum heavily laced with PC terminology. Many "low-residence" students are not found on campus but take classes via the Internet. This distance learning approach undercuts the original rationale for starting a campus in Monterey Bay, which is another source of criticism. Proponents of the school say that Monterey's 1521 students are acquiring skills for the 21st century -- "technological competency and the ability to communicate in cross-cultural and global contexts" (Burdman, p.A27). In spite of the criticisms, students and faculty alike agree that the school provides alternative pathways for learning.

In order to implement an effective technology program at the postsecondary level of education, faculty must have the motivation and incentive to share the vision for such a program.

They must recognize the value of incorporating technology into their teaching and must feel that their efforts are, at least, respected. Release time, recognition from the administration and colleagues, instructional needs and assistance from technical experts are some of the more successful incentives for college faculty. Additionally, monetary compensation is sometimes made for faculty pursuing technology projects. Other strategies could include travel, hardware and software and increase in salary and/or benefits. To transform a department or college requires not only leadership but self-motivated faculty who work hard to implement technology in a useful and practical way (Lan, 1996).

At Waubonsee Community College, faculty is engaged early on in the planning process for the development of technology on campus. Faculty feedback is requested before any installation begins. What each faculty member sees as effective in the telecommunications classroom is implemented and results in giving faculty a sense of ownership. Additionally, they are requested to participate in the distance learning program. Participation is on a strictly volunteer basis and access is provided to information sessions and training workshops to enable all volunteers to be more effective distance learning instructors. General computer training sessions are given several times a year and faculty who participate are compensated for their time. At Waubonsee it is felt that involving faculty in the process of developing technology is necessary from design to implementation (Swalec, 1993).

Incentives are provided for faculty at Waubonsee to participate in the generalized computer training sessions. Training of faculty is essential to the success of any technology program with increasing numbers of faculty desiring to incorporate technology into their curriculum in order to facilitate, enhance and even change their instructional methods. A survey of existing literature revealed the most effective and innovative types of faculty training. The

training is usually an on-going effort taking the form of a variety of formal training sessions or workshops during the regular school terms -- one or two hours for a short session with single or multiple sessions, half-day meetings, three-day intensive workshops. In some colleges, monthly technology meetings are held which include one-on-one technology training opportunities with a "technology trainer" who is available on-call for 24 hours per week at one institution (Swalec, 1993). In the summer one- or two-week long session are sometimes held. Training can be one-on-one tutoring, small group sessions for a specific topic or large group for more generalized information and demos by vendors. One college offered one-on-one tutoring sessions during posted hours 24 hours per week at specialized times during the year. Many faculty preferred this one-on-one approach because they felt that they needed individual attention to master new processes. The compilation of a college technology newsletter is another method of training that has been initiated at several institutions. Faculty and staff can study the newsletter when time allows. More innovative methods are sometimes required, such as brown bag sessions, technology fairs, day-long field trips to off-campus models of educational technology and guest speakers (Lan, 1996). Lan (1996) discovered an innovative approach called "jigsaw development." At one college a committee was formed from one interested faculty member from each of five disciplines. Each committee member then focused his/her learning on one aspect of technology for the classroom. "The person who learned interactive video would teach the four others about interactive video, while the person who learned HyperCard would teach the other that application" (Han, 1996, 8). The result of this jigsaw of individual efforts was that the college developed in-house expertise in five subject areas and these expert faculty became mentors to others.

Just as faculty need instruction in technology, many students are not well-prepared for college technology and must be trained in the use of computers, as well. Most colleges make standard word processing programs available to students and offer tutoring and guidance in specialized labs. In addition to bolstering fundamental writing skills, students learn how to use word processing programs. They can learn how to use e-mail and the World Wide Web when the Internet is available in these labs. Some specialized software is developed at a particular colleges and can assist students in learning the fundamentals of specific courses such as chemistry and mathematics. This type of software allows students to repeat screens or take as long as they wish to read and reread information. At Washington State University, the EXCEL Program is used to incorporate technology by having students use groupware, e-mail and the Internet. The students can work together on assignments and later post them for review. They can also take part in an interactive lab and are encouraged to create multimedia presentations, using as many aspects of the technology available to them. Students in this program have shown dramatic improvement in grade point average and achievement (Cartwright, 1997).

In addition to training faculty and students, the successful technology program must include an adequate number of well-trained technical support personnel. These personnel must be coordinated by a person in a strong leadership position such as a dean or associate dean, the director of the college technology department, or a technology committee. The technical support staff could include a network administrator, media specialist, instructional designer, training or multimedia development specialist, and a technician who could set up and maintain equipment. Additional faculty competent in supervision and teaching of the appropriate technologies might be required. Additional technical staff may also be necessary to support faculty (Lan, 1996).

Because of the lack of adequate technical assistance many college campuses are suffering from a "user-support crisis." While institutions have equipped offices, classrooms, and dorms with networked computers and software, many haven't added the necessary technical staff members to help professors and students take advantage of the growing web of information available on their computers. This crisis seems to have grown over recent years as technology is more in demand than ever. A survey taken of information technology administrators on campus computing lists in 1996 showed inadequate user support to be the number one concern at public colleges. This survey is conducted annually by Kenneth C. Green of Claremont Graduate School. Forty-two percent of those surveyed saw this to be their greatest concern while only 10% saw "enhancing the campus network" as the most important issue. On many campuses, the number of computers has doubled or tripled but the number of support personnel has not kept up with this growth. The demand for people with computer skills is increasing everywhere, and the pay at the college level is not very competitive. Added to this is the industry's habit of constantly upgrading software and hardware which demands that computer staff not only install the new products but answer all manner of questions regarding its use. Many fear that if technical staffs are not adequately increased, some faculty will go back to chalkboards and transparencies (Guernsey and Young, 1997).

If and when this staff is increased, it must be taken into account that there is an increased demand for technical support at the start of the school year which tapers off in just a few weeks. At the beginning of every fall semester, staff must train new student employees, answer faculty members' calls for help and maintain public computer labs. So the dilemma that college campuses face is if they hire extra people at the beginning of the semester, what can be done with them when the demand decreases in a few weeks? Some schools have asked students to seek

help in public computer labs; others have discounted tuition for students who are willing to work as computer consultants. At the University of Rochester, a help desk was created to service the network in the dorms; 14 students were hired to staff the desk and make "house calls." Some institutions have considered hiring temporary help for the month of September. In the future, companies that provide temporary computer help could conceivably be an outsource supplier of all computer support services during the first three weeks of school (Selingo, 1997).

In order to support all the training and technical staff that is needed in any successful technology program, resources must be committed. There are several potential sources for the funding needed. One of those sources is internal funding which is supplied by student fees and institutional revenues, such as a technology budget. External funding includes grants from federal, state, regional or governmental entities, private foundations and corporations. Once these funds are available, they can be used by faculty to develop courses which incorporate technology into the classroom, to provide release time for faculty working on some technology project, to compensate support personnel and training staff and to purchase hardware and software (Lan, 1996).

Dr. Martin Ringle has compiled a checklist for small colleges that are faced with technology challenges. The following ten questions are intended to assist technology planners deal with the most crucial issues they face.

1. Do you evaluate technology investments by how well they serve the institutional mission?
2. Are you using the World Wide Web (WWW) to its full potential for teaching, student recruitment, campus information, public relations and other purposes?
3. Has your institution made provisions to enable easy electronic communication on campus as well as with alumni, parents, prospective students and scholars at other institutions?

4. Are your faculty prepared to take advantage of curricular opportunities provided by the WWW, multimedia and other new technologies? Are there incentives (or obstacles) for faculty who wish to integrate technology into their courses?

5. Has your institution explored collaborative relationships with other colleges to provide technology and information resources in the most cost-effective ways? Have special alliances with technology vendors been pursued?

6. Is there a campus-wide policy that provides ethical and legal guidelines for the use of facilities such as the Internet, e-mail, and the WWW?

7. How is your institution dealing with copyright and licensing issues as it broadens electronic access to library materials?

8. Do you have a policy that covers ownership and/or royalties for electronic materials produced by faculty or other members of the college community?

9. Do you have an institution-wide policy for allocating, upgrading and replacing computer equipment?

10. Are planning and budgeting for information technology and information resources done in a cohesive manner?

These questions were formulated from a workshop in November 1995 which included representatives from over 80 colleges in the U.S., Canada and Japan (Ringle, 1997).

The literature suggests that the four areas of consideration cited earlier are ones that every campus which is dealing with technology issues are having to address. The management of personnel hired to support technology, the jobs assigned to those personnel, ways to motivate faculty to fully utilize the technology and funding are issues central to any discussion about campus technology.

Miramar College and Comparison of its Staffing Patterns to Other Community Colleges

Miramar College

Miramar College is one of three two-year colleges that comprise the San Diego Community College District. Miramar College serves a 1990 district population of about 300,000 and enrolls approximately 6000 full-time equivalent students (FTES). The district population is expected to grow by 26% by 2000 and by an equal amount by the year 2015. A significant proportion of the district's population is made up of military personnel stationed at a base within the district. As it converts from a Navy to a Marine base, the number of personnel stationed there is expected to more than double.

Miramar College is a publicly-funded community college and, as such, is reliant on the state of California for a major portion of its fiscal support. The economic climate in California has improved in the past few years, and the Governor's budget for education and community colleges is expected to continue to be positive.

Moreover, the California Community Colleges Chancellor's Office has adopted five areas of accountability to be measured by the community colleges: (1) student access; (2) student success; (3) student participation and satisfaction; (4) human resources; (5) fiscal and physical resource use and renewal (Improving It, 1990). Each of these will be impacted to some degree by the decisions a college makes regarding technology.

As is the situation with most other community colleges, the types and uses of technology at Miramar College have grown significantly over the past few years. Since Miramar is a part of a community college district, most of the administrative and student services computing functions are housed at and maintained by the district. However, according to Miramar College

President, Dr. Louis Murillo (1997), the number of computers on the campus has tripled in the past two years. Most of the 75 contract faculty have computers, as do all of the 55 classified staff. The institution currently has a total of about 800 computers.

The number of computers and the corresponding dependence on technology are expected to continue to grow in the next two years. According to the *Miramar College Growth Report* (Murillo, 1997), the college has seven computer labs either installed in the past year or planned to be operational within the next year. Additionally, the college has recently installed a state-of-the-art video conferencing classroom that has been used to conduct classes simultaneously at Miramar College and San Diego City College. The college plans to use this technology to reach other sites, including such private sector businesses as Qualcomm, to whose employees they would like to deliver general education classes (Gallego, 1997).

A few other technology-based instructional programs are already in place at Miramar. For example, the college uses INVEST, a Josten's Company software for teaching basic English, math, and reading skills. Students using this program have shown a two-year gain in skills during a three-month period of use. Also, one Miramar College science instructor has been identified as exemplary by the state chancellor's office and is working for the state via an Interagency Jurisdictional Agreement to develop video conferencing. Finally, the college is in the process of creating a faculty research center that will house a multimedia training center/smart classroom.

Miramar's administrative computing functions are handled primarily at the district level; however, that does not preclude the necessity for some local administrative computing. For instance, the college President envisions faculty and staff having access to such features as electronic mail and scheduling in order to more efficiently perform such tasks as intracampus

communications, scheduling meetings and posting agendas, and allowing electronic access to meeting minutes. This limited administrative function should be considered in conjunction with the larger instructional technology needs (Murillo, 1997).

While the technology has grown (and plans are in place for greater expansion), the infrastructure for supporting the technology has not kept pace. Currently, the support staff consists of two full-time technicians, one hourly technician who is employed on an ad-hoc basis, and one 40% release-time faculty member. With the growth in the number of computers and the increasing complexity of the type of technology, it is important that Miramar College develop a staffing plan that addresses the four considerations listed earlier.

Comparison of technology staffing patterns

The task force undertook a mail and telephone survey of the ten community colleges closest in size (based on FTES enrollments) to Miramar College to determine their levels of academic technology and the staffing patterns associated with them. (See Appendix 1 for a listing of the colleges and Appendix 2 for a copy of the preliminary letter that was sent to each college.) Of the seven respondents, most of the colleges had between 800 and 1000 computers, most of those added within the past three to five years. Almost all of the colleges were also currently undergoing a change in the organizational structure of their technology units to address more pointedly the change in academic technology. The following summary represent the highlights of the colleges' responses. (See Appendix 3 for functional charts of the colleges' academic technology for the ones that were either provided by the college or could be constructed based on information collected.)

MiraCosta Community College

MiraCosta has increased the number of computers on the campus from only a "handful" a few years ago to about 880 currently. They are in the process of implementing a new staffing structure. The proposed Instructional Services Division would be headed by a Vice President who would in turn manage a Dean of Academic Information Services, responsible for academic computing, administrative computing, distance learning, information technology, media services, technology instructional center, and the CIS and library academic departments. All technology training is delivered by volunteers on a regular, rotating schedule; training sessions are well attended.

College of the Sequoias

The Director of Computer Services at COS reports to both the Vice President, Administrative Services, and the Director of Facilities and is responsible for administrative, network, and instructional technology. He is responsible for evaluating, purchasing, and maintaining the approximately 1,000 computers for the campus. His administrative and network teams consist of two senior programmer analysts, responsible for student and information services, and two senior programmer analysts who service the campus's administrative file servers. He has two technicians who install PCs for faculty and a technology committee which determines technology priorities and conducts web and software research. Although Computer Services provides five aides and five assistants and a number of employees for the LRC, each department is responsible for its own lab aides in specialized labs.

Shasta-Tehama-Trinity

The Director of Information Systems is tasked with all areas of computing on campus and reports to the President of the College. The Administrative Computing Service Manager reports

to the Director and handles all payroll, admissions and administrative computing functions. Academic functions are handled jointly by the Extended Telecommunications and Extended Education Departments. The Extended Telecommunications Department handles all academic computing and service with the exceptions of the LRC and specialized labs, i.e., math and engineering, which are staffed by those departments. The Extended Telecommunications staff is comprised of a hardware technician, an interactive technician, training technician, a computer support staff member and a secretary to field all telephone calls and service requests. The Extended Education Department is responsible for the remainder of academic computing services, which includes all interactive computer functions, including training, and all off-campus or distance learning. This department employs only one interactive technician and a faculty volunteer who provides part-time training support.

College of the Desert

Due to a recent change in the organizational structure of COD, the Director of Technology reports to the President. She manages primarily administrative computing but also manages the half-time PC lab technician and student assistants for two 100-computer labs and the academic skills center. When the current session of Title III funding is complete, she expects to regain responsibility for the full-time trainer.

Antelope Valley

The newly created position of Director of Information Technology Services is at a level equivalent to a Dean. The Director is responsible for all aspects – purchase, support, training, repair – of academic and administrative computing on this campus, which houses over 1,000 computers. Half of their computers have been acquired within the past five years. They have one place on campus with Internet access. A classified confidential employee has been tasked

with developing expanded access to the Internet for students and staff. Titles and descriptions of other staff assigned to technology were not available.

Waubonsee Community College

Waubonsee, located in Sugar Grove, Illinois, is the only community college outside California that the task force interviewed. During the late 1980s and early 1990s, Waubonsee's technology advances received wide publication in a number of articles, and college personnel actively participated in conferences presenting information about their technology innovations.

In conversation with college computing personnel, the task force found that Waubonsee is facing the same dilemma as the other colleges: a growth of technology without a corresponding enhancement of the infrastructure.

The college has about 900 computers. The Executive Director of Information Technology reports to the Vice President of Finance who reports directly to the college President. The Executive Director manages the Computer Coordinator, who oversees one full-time and three part-time hardware/software technicians and one full-time and four part-time help desk personnel.

Miramar College

Academic computing responsibility is currently dispersed. The INVEST basic skills lab is directly under the Vice President, Instruction, while the head of the School of Technology and Math (who reports to the Vice President, Instruction) manages the computer labs and is responsible for the network specialist, the instructional lab technician, and the hourly technician. The college also grants 40% release time to a faculty member to assist with technology implementation. The campus has about 800 computers, most of which are used for instruction.

Recommendations for Miramar College

Recommendations

Discussion

Miramar College finds itself in an opportune situation as it faces the future of instructional technology. The global acceptance, even the encouragement, of utilizing technology to deliver instruction is growing. The economy of the state of California has rebounded and the current Governor is supportive of education and community colleges, in particular. Many community colleges across the country are considering changes in their approaches to academic technology and can provide some examples of effective implementation. The San Diego Community College District (SDCCD), which oversees the activities of Miramar College, has published a technology plan, *San Diego Community College Strategic Directions for Information Technology and Connectivity* (1994). In that document, the district maintains that "community colleges must make significant improvements in information technology and supporting infrastructure" to prepare students to "compete in an information-based global economy" (p. 2). The district then declares its commitment to the needed improvements. Even the district chancellor, Augustine Gallego (1997), praised Miramar's innovations in a national community college publication and cites technology as the possible best way for community colleges to expand access and keep costs manageable (Gallego, 1997). Finally, the President of Miramar College is excited about helping to shape the future of academic computing at the college; this top-down leadership, coupled with encouragement and empowerment of front-line personnel to embrace the technology, is essential to the success of the undertaking.

The college's *Visioning 2000: A Strategic Action Plan* (August 1997) lays the groundwork for incorporating instructional technology more fully into the curriculum and structure of Miramar College. When linked with the SDCCD vision statement as it relates to technology, the two provide a solid foundation for going forward with implementing changes to the instructional technology staffing structure. Associations can be made between the two plans as shown in Figure 1 on the page 21. See Appendix 4 for a copy of the *San Diego Community College District Strategic Directions for Information Technology and Connectivity* Vision Statement; see Appendix 5 for *Miramar College Visioning 2000: A Strategic Action Plan.*

Three cautions might be in order at this point. First is the need to recognize that change doesn't happen instantly, particularly in education, and that it must be planned for. The research showed that most technology change takes about three years to enact, with ongoing refinements necessary. Cartwright noted that it took "3 years and 8 days" from the time the college presidents at Floyd and Clayton Colleges conceptualized their goals until final approval was given; only after that could implementation begin (1997).

Second, as SDCCD states in its technology plan, it is important that an institution not be on the "bleeding edge" of technology but that caution be exercised to ensure that the adopted technology will not become too quickly obsolete or superseded by a newer technology. The same case can be made in staffing considerations. The staff must be organized in a way that will most benefit the institution's overall mission and that can continue to be funded over the long term. While this report focuses on the staffing considerations related to technology, it must be laid alongside the broader college structure and goals for closer examination to ensure a good fit.

Finally, Miramar College's larger technology need, as outlined by Dr. Murillo, is academic technology. The lesser need is the limited administrative computing that will give

employees electronic access to information and must not be overlooked. This need will be addressed as appropriate in the recommendations.

The recommendations will address each of the four considerations that have formed the framework for each segment of this report. Each recommendation will also identify the Miramar College goal as stated in its *Visioning 2000: A Strategic Action Plan* that the recommendation will address. Summarized, the four considerations are

1. Organizational structure
2. Personnel
3. Support and training
4. Costs

Figure 1

Relationship Between
San Diego Community College District Strategic Directions for Information Technology and Connectivity Vision Statement and *Miramar College Visioning 2000: A Strategic Action Plan.*

SDCCD Strategic Directions for Information Technology and Connectivity Vision Statement	Miramar College *Visioning 2000: A Strategic Action Plan*
Information is fundamental to the mission of the San Diego Community College District, and information is of critical importance	*Goal: Technology and Instructional Equipment* Strategy 3. Create a comprehensive college plan for technology that articulates the goals of the college, funding levels recommended to maintain current technology, campus-wide technical support and staffing required to implement the goals of such a plan.
Academic excellence is becoming increasingly dependent upon the use of modern information technology. This technology must be acquired, maintained, managed and used in an effective and efficient manner.	*Goal: Academic Programs* Strategy 4. Promote innovative teaching techniques such as team teaching, collaborative learning methodologies, attention to and accommodation of various learning styles, and the use of technology as a teaching tool. *Goal: Technology and Instructional Equipment* Strategy 3. Create a comprehensive college plan for technology that articulates the goals of the college, ..., campus-wide technical support ... required to implement the goals of such a plan.
Possessing advanced technology without the ability to use it effectively is of little value. Continuing education and comprehensive, dependable support must be of the highest priority for the local community and the faculty, staff, and students of SDCCD.	*Goal: Academic Programs* Strategy 9. Increase staff development opportunities for faculty and staff in technology... *Goal: Technology and Instructional Equipment* Strategy 4. Offer training for all who express an interest in computer training so they may better serve students. Strategy 5. Encourage faculty to incorporate the use of technology as a teaching tool. Strategy 6. Offer competent, available, technical support to faculty using technology to assist in classroom instruction.
It is the vision that SDCCD will become an active participant in the information technology networks of San Diego County, the state of California, and the nation, supporting and participating in educational interactions among public institutions, industry, governmental agencies, faculty, staff and students.	*Goal: Academic Programs* Strategy 3. Promote an applied curriculum in which students readily make the connection between the academic lesson and its application in the workplace. *Goal: Technology and Instructional Equipment* Strategy 1. Implement distance education capability to all San Diego Community College District locations and other key sites within the next three years. Strategy 2. Offer on- and off-campus learning resources and Internet access to all students

Organizational Structure

Discussion

The current trend, reflecting the emphasis that colleges are placing on instructional technology, is to centralize the technology function, head it with an academic administrator, and align it closely with the college president. The centralized approach allows one single unit to evaluate the campus's technology needs; make recommendations to meet those needs while maintaining a degree of standardization for efficiency; oversee the purchases, installation, and maintenance of the hardware and software; and provide training services. Placing an academic administrator in this position reinforces the college's commitment to *academic* computing; the administrator will bring to the position both a teaching/learning paradigm and a technology focus. Finally, positioning the unit under the President serves to ensure that services are evenly distributed across all divisions and functions diminishing duplication of efforts.

Recommendation

We recommend that Miramar College centralize information technology, headed by a Dean of Information Technology, who will report to the college President. The incumbent will manage both the instructional technology and the limited administrative technology required by the college. An Administrative Assistant would report directly to the Dean and would serve the entire unit in completion of administrative and clerical tasks.

This placement at Miramar College would fulfill the Academic Programs goal, Strategy 2 (Integrate and stress the following skills across the curriculum: … computer literacy… and other curricular themes that provide a student a quality educational experience at Miramar College) and the Technology and Instructional Equipment goal, Strategy 5 (Encourage faculty to incorporate the use of technology as a teaching tool).

The California Community Colleges Chancellor's Office maintains a database of open faculty and administrative positions in the 106 state community colleges. This service, called "The Registry," invites professionals to enter their names, addresses, and qualifications into the central database for consideration for positions. It also allows colleges with faculty and administrative openings to advertise those positions. Participating professionals are then contacted regarding open positions for which they might qualify. Both the colleges and individuals can access The Registry on-line. The task force recommends that Miramar College consider participation in The Registry as one way to recruit for this critical position. (See Appendix 6 for a sample scannable entry form for The Registry as well as their home page and on-line address information.)

Personnel

Discussion

With information technology centralized under an academic administrator, all technology on the campus can be centrally managed and coordinated. This arrangement incorporates the three components of technology under one organizational unit: (1) computer services, both hardware and software; (2) academic technology, including instructional technology, the microcomputer labs, and support services; and (3) the internal and external networks. This efficient configuration allows purchasing, installation, and maintenance of all equipment to be coordinated while ensuring that all aspects of instructional technology, both current and planned, can be addressed seamlessly from instructional design to staff training and support to delivery of the instruction. The network component addresses the limited administrative computing needs

for internal communication (Intranet) and such activities as event scheduling and document dissemination as well as external access (Internet) for both administrative and academic needs.

The two primary units should be managed by highly qualified personnel with expertise in their respective areas of computer hardware and software and academic technology. The networking responsibilities should be met by someone with a solid background in all aspects of internal and external networking.

Three related personnel issues that the college might face have to do with employing student assistants, employing academic interns, and outsourcing specified jobs. Colleges have addressed these issues in a variety of ways.

Colleges have used student assistants with varying degrees of success. Generally, because the colleges offer a two-year degree program, the college finds that by the time a student has learned enough during the second year to be of significant assistance, s/he is ready to transfer to a four-year institution or to leave the college for employment. It becomes apparent, then, that student assistants can usually be assigned only rudimentary tasks and must be supervised closely in performing those tasks.

Another consideration is to utilize undergraduate students in their third or fourth year of college or graduate students in a technology-related field. Universities often offer their students the opportunity to earn credit for internships or externships and a community college academic technology unit would be an appropriate setting. Often, the only requirements on the part of the community college periodic meetings with the student's university faculty advisor and an evaluation of the academic objectives to ensure that the academic requirements are being met.

Outsourcing specified tasks is another consideration that many colleges consider. Caution must be taken, however, to ensure that the outsourcing does not interfere with the

contract that has been negotiated with the staff who would normally perform the jobs being considered for outsourcing.

Recommendations

We recommend that Miramar College organize its technology operations in two distinct areas under the Dean of Information Technology – Computer Services and Academic Technology – each to be headed by a Coordinator and staffed with specialists in discrete functional areas.

The Coordinator of Computer Services would manage the Hardware Specialist and the Software Specialist. This unit would be responsible for the purchase, installation, and maintenance of all campus hardware and software and would perform programming tasks as required. A Computer Technician would assist in the fulfillment of these duties.

The Coordinator of Academic Technology would manage the Instructional Specialist and the Support Specialist. This unit would be responsible for the design and development of technology-based curriculum, including distance and web-based instruction and providing user services and training on all campus equipment and software programs.

A Network Specialist would report directly to the Dean of Information Technology and would be responsible for both internal and external networking. This person would need to be certified in the technology that the campus uses and would address the administrative need for internal communication while providing support to the academic technology function in coordinating external networking requirements. S/he would work closely with the Instructional Specialist to automate the curriculum that was developed by the Instructional Specialist.

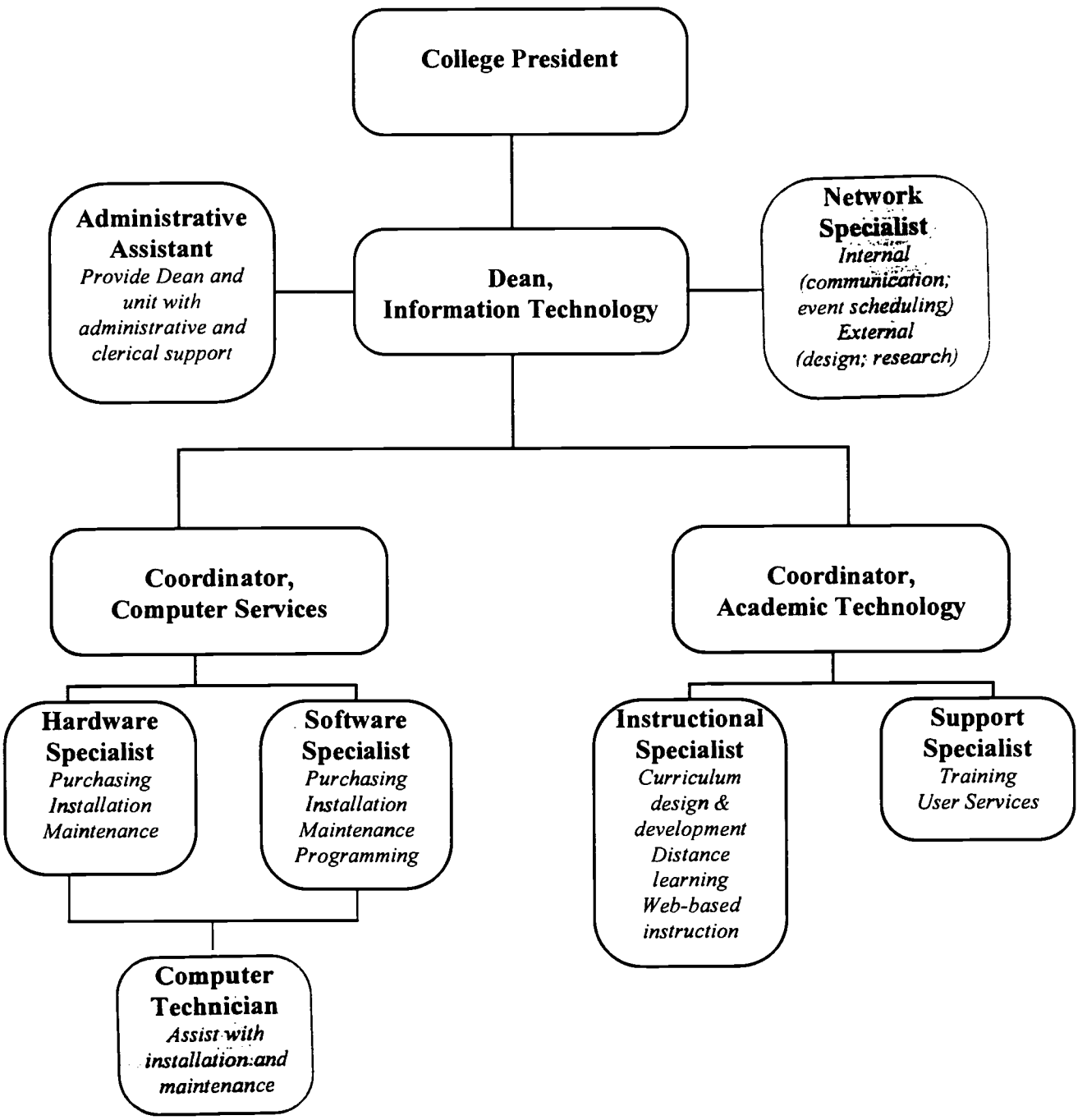
This recommendation addresses the Academic Programs goal, Strategy 5 (Hire additional contract faculty and instructional support staff to facilitate a comprehensive curriculum) and the

Technology and Instructional Equipment goal, Strategy 3 (Create a comprehensive college plan for technology that articulates the goals of the college, …, campus-wide technical support and staffing required to implement the goals of such a plan). Figure 2 on the following page is an organizational chart displaying the proposed organization of instructional technology. Appendix 7 contains representative functions of the units represented by the Dean of Information Technology; the Network Specialist; the Coordinator of Computer Services; and the Coordinator of Academic Technology.

The task force recommends that Miramar College continue the practice of departments providing their own support for their specialized labs. A future consideration might be to organize all of the department labs under the management of the Dean of Information Technology.

Finally, the task force recommends that the college investigate further the three issues of employing student assistants, employing academic interns, and outsourcing, defining carefully the parameters of each and determining the best approach to addressing them.

Figure 2
Proposed Organizational Structure
Instructional Technology
Miramar College



Currently staffed positions: duties may differ from current assignment

Support and Training

Discussion

Concern about support is the number one concern of most technology users and is the primary barrier that hampers the use of technology. That concern can translate into a lack of motivation because of fear. It is important to address this concern and, in the process, to build in methods of motivating faculty to incorporate technology into their instruction. By providing a Support Specialist who is charged with delivering support and training, faculty are assured of the assistance they need to succeed in their attempts to use technology.

To encourage those faculty who have never used technology to do so, a first-step formula can be offered: (1) Demonstrate a simple technology application that is meaningful for their subject matter; (2) Teach them how to develop and use it; (3) Invite feedback on their experience; (4) Encourage them; (5) Build on small successes. By bringing reluctant faculty slowly into the use of technology, they will be more accepting and more likely to continue to be motivated. Constantly available support and ongoing training will assure them that they are not alone and will erase their fears of trying something new.

Incentives can be built into the equation, if necessary. Many times, their own successes are sufficient incentive. That is, as they become more comfortable and confident, they press themselves to accomplish more, to go to the next level, to outdo themselves (or others). If considered, incentives should be carefully constructed. Monetary incentives have been found to be less attractive than others; for instance, most faculty enjoy release time to work on projects more than money.

A sense of collegiality is also important. Providing not only one-on-one support and training but also group experiences can be an effective motivator as each shares her success with

the others and reaps the applause of her colleagues. This same experience can serve as peer pressure to those who are not using technology and help to bring them into the circle. The research center that Miramar College is currently designing could become the physical center of this sharing.

Recommendations

We recommend that Miramar College incorporate a variety of opportunities for college personnel to experience the use of technology and to enhance their skills in its use. The following suggestions are intended as a starting point on which to build activities that will encourage the greatest possible use of technology.

- House the Support Specialist in the newly-created Research Center to encourage faculty and provide support
- Create a newsletter highlighting the activities of the Center and feedback from faculty using technology
- Make Research Center inviting, non-threatening, available to all
- Create brochure introducing Research Center to faculty, particularly new faculty as they are hired
- Conduct workshops on a regular schedule
- Organize field trips to see technology used in other colleges and other settings
- Utilize the jigsaw method: one faculty member becomes adept in one software or technique and teaches the others; as more faculty members learn more and teach more, the college will develop a cadre of in-house technical experts
- Maintain and distribute a listing of new softwares available for use
- Pay for conferences and other travel
- Grant release time for faculty to work on technology projects
- Provide hardware and software for faculty
- Recognize each technology accomplishment
- Stage a technology fair, inviting hardware and software vendors to participate
- Investigate other colleges' Research/Media/Resource Centers (Appendix 8 contains an example from the Center for Teaching and Learning from American River College)
- Stock academic technology publications for check-out by faculty and other users

This recommendation addresses the Academic Program goal, Strategy 9 (Increase staff development opportunities for faculty and staff in technology, writing across the curriculum,

teaching methodologies and other areas of interest), the Technology and Instructional Equipment goal, Strategy 4 (Offer training for all who express an interest in computer training so they may better serve students), and Strategy 6 (Offer competent, available, technical support to faculty using technology to assist in classroom instruction).

Costs

Discussion

While the cost of acquiring technology is substantial, the ongoing support and personnel costs can outweigh the initial costs and must be planned and budgeted for the long term. As previously stated, the fear of a lack of support is the chief concern among technology users. Also, the trend among most community colleges, and Miramar College seems to be no exception, is that the purchase of technology has far outpaced the development of the infrastructure. Based on these factors, it is important for the college to plan for appropriate costs associated with supporting both the current technology and the technology needed to keep pace with future demand.

The task force reviewed the salary structures of four institutions to determine the staffing costs for the Information Technology positions proposed for Miramar College. Not every institution staffed every position; parallels were drawn where possible. The following table (Figure 3) shows the results of the salary survey. Where a range was given, the median is reported; all dollar amounts were rounded to the nearest thousand; no benefits are included. See Appendix 9 for a listing of college sources used in the salary survey.

Figure 3
Salary Survey Results for Positions in Proposed Organizational Structure, Information Technology, for Miramar College

Title	College 1	College 2	College 3	College 4	Composite *
Dean, Information Technology	$ 65,000	$ 73,000	$ 87,000	na	$ 52,000
Network Specialist	35,000	39,000	na	$ 28,000	28,000
Coordinator, Computer Services	40,000	46,000	na	na	32,000
Hardware Specialist	35,000	na	na	na	28,000
Software Specialist	35,000	na	na	na	28,000
Computer Technician	30,000	33,000	na	26,000	26,000
Coordinator, Academic Technology	40,000	46,000	na	na	32,000
Instructional Specialist	35,000	38,000	na	na	28,000
Support Specialist	30,000	36,000	na	na	24,000
Administrative Assistant	22,000	26,000	na	na	18,000

** Composite calculated as ratio of known College 4 salaries compared to College 1 salaries to determine approximate representative range of salaries.*

Recommendations

The salaries range from a total of $296,000 to $367,000 annually. Given the two positions that are currently staffed at Miramar College, the net salary range would be $242,000 to $302,000 annually. This was a cursory salary review of only four sources. The task force recommends that Miramar College conduct a more extensive salary review of local community colleges, four-year institutions, government agencies, and private industry to determine the appropriate salaries while keeping in mind the accompanying benefits that must be paid and the annual increases that must be considered.

The task force further recommends that Miramar College actively seek external funding for underwriting a portion of the costs for technology. Possible sources might include regional, governmental, state, and federal entities, as well as private agencies, corporations, and foundations targeting technology, particularly educational uses of technology.

Finally, an investigation of cost-reduction strategies should be considered. For instance, outsourcing a portion of the maintenance might be a possibility, depending on the restrictions imposed by the contract negotiated with the bargaining unit.

Conclusion

Miramar College is facing technology-based decisions similar to those that many other community colleges are also facing: how to build the infrastructure to support the current technology as well as future technology needs. The recommendations contained in this report form a strategic outline to assist Miramar College as they further investigate the challenge of integrating a more sophisticated educational technology system into their instruction.

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