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ABSTRACT

This plan for the Community College of San Francisco (CCSF) documents the steps necessary to foster the appropriate use of current and emerging information technologies to systematically integrate educational technology into the curriculum and into student services. Following an executive summary, Part One introduces the plan, including a mission statement, scope, premise, goals, and student outcomes. Part Two provides background information, including the state of the institution, the purpose of education technology, faculty interest, and student interests. Part Three offers the plan, which includes objectives for the following goals: (1) provide the physical infrastructure and technical support necessary to make education technology accessible and useful for faculty and students; (2) increase opportunities for faculty and students to use education technology; and (3) develop a system for continued planning for, evaluation of, and ongoing funding for education technology. Part Four presents the implementation timeline for the period between fall 1996 and fall 1998. Appendixes include: needs for information technology at CCSF not covered in the report; basic assumptions of the plan; a detailed inventory of the institution's technology resources; responses to two surveys measuring faculty interest in education technology; a discussion of the role of and training for student assistants; video production, transmission and distance learning efforts; implications and examples of educational technology; and a glossary of terms. (HAA)

CREATING OPPORTUNITIES:

Using Information Technology in Education

For Instruction, Instructional Support and Student Services

CITY COLLEGE OF SAN FRANCISCO

Adopted by the Board of Trustees of the
San Francisco Community College District
on March 27, 1997

CREATING OPPORTUNITIES

Using Information Technology in Education

City College of San Francisco

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THE DEVELOPMENT OF AN EDUCATION TECHNOLOGY PLAN FOR CCSF
History Of Committees, Working Groups And Drafts

- **3/7/94** first meeting of the Education Technology Task Force of the Master Plan Committee (MPC) (the task force was created by the MPC on 2/14/94)
- **10/27/95 draft** titled Education and the New Technology which on 12/1/95 the MPC asked to be redrafted based on various concerns. The first concern was that the plan "be faculty and student centered"
- **12/95** first meeting of the Academic Computing Task Force to redraft the above plan
- **2/22/96 draft** titled Creating Opportunities: Education and Information Technology
- **2/23/96** first meeting of the Strategy Development Team for Technology. "Building off the Educational Technology Plan, the team will specify the steps necessray for CCSF to use technology to improve educational and administrative processes"
- **3/22/96** MPC meeting to discuss the 2/22 draft
- **9/11/96** meeting of combined task forces and development team to incorporate comments from the Strategic Planning process
- **10/4/96** MPC reviewed 9/24/96 draft of Creating Opportunities: Education and Information Technology. Slight changes were made including a change in the title and the addition of an Executive Summary
- **10/16/96 draft** titled Creating Opportunities: Using Information Technology in Education circulated by Master Plan Committee to all administrators, department chairs, program coordinators and presidents of college organizations. This draft included the Executive Summary and a comment sheet to be returned by 11/12. Per MPC request, the appendices were not duplicated for each copy. Instead, the cover memo and the Table of Contents clearly stated that "An appendix is also available for your review at all CCSF libraries." This decision was made at the 10/18 meeting of the MPC
- **11/15/96** MPC voted to recommend the plan (with approximately 22 changes based on written feedback) to the Chancellor for adoption by the Board of Trustees. Most of these changes were minor wording changes
- **11/15/96 draft** of Creating Opportunities: Using Information Technology in Education sent to Chancellor
- **11/20/96** The Academic Senate passed a resolution that a letter be sent to the Chancellor stating that the Teaching and Learning Technology Roundtable (TLTR) should review the document and make recommendations
- **2/3/97 draft** of Creating Opportunities: Using Information Technology in Education given to the Academic Policies Committee. This draft contained 5 minor changes to the 11/15 draft based on the review of the TLTR. This plan remains largely the same as the 2/22/96 draft with the major additions of the Executive Summary and the Implementation Timeline
- **2/27/97 presention** to San Francisco Community College District Board of Trustees
- **3/27/97 adoption** by SFCCD Board of Trustees

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EXECUTIVE SUMMARY

INTRODUCTION

City College of San Francisco is increasingly aware of the benefits to be obtained from using **education technology** (information technology used in the delivery of education). At present, education technology is focused on digital and electronic technology, but in the future it may encompass other areas. Examples of education technology include the Internet, networked computer systems, and multi-media systems, which may incorporate graphics, video and broadcast communications, and text. **Awareness of the need** for and benefits of the use of education technology come from several areas:

- student interest in the use of education technology to enhance their ability to compete in the workplace and current and future academic programs
- faculty interest in the use of education technology to enhance teaching
- staff and faculty interest in maintaining workplace skills commensurate with the general public
- national interest and research in the use of education technology to enhance the teaching and learning experience.

STATE OF OUR INSTITUTION

Currently at CCSF, a number of resources for education technology exist, and some faculty are able to take advantage of these resources. However, **CCSF lacks a college-wide vision** for systematically integrating education technology into the curriculum and Student Services. In requesting this plan be written, the Master Plan Committee acknowledged that CCSF must organize its resources to sufficiently support the use of education technology. This plan outlines the necessary **structural supports** and **administrative procedures** needed for coherent and efficient incorporation of education technology throughout CCSF. The plan highlights some of **our current limitations:**

- lack of physical infrastructure (networked wiring for classrooms, on campuses, and between campuses)
- insufficient number of workstations for faculty, staff and students
- inadequate technical support/training for faculty, staff and student needs
- insufficient communication and coordination among college groups involved in making decisions regarding education technology

OVERRIDING CONCERNS

This plan proceeds under the premise that our institution should support and foster a wide array of individual faculty initiatives, department-based plans, and institutional plans, **at a minimal cost to the student.** Saying this, we acknowledge that increasing the use of education technology can prove to be costly. Therefore, the plan calls for the investigation of possible avenues for providing access to (at present) the Internet, multi-media and networked workstations. This may involve pursuing partnerships with the business community and other education institutions, or the possibility of a minimal student-technology fee. Our primary concern is to provide opportunities to students, faculty and staff while limiting the financial burden to the students of CCSF.

GOALS OF THE PLAN

1. Provide the **physical infrastructure** and **technical support** necessary to make education technology accessible and useful for faculty, staff, and students.
    - Provide technical support for offices, labs, and classrooms.
    - Expand facilities in Batmale Hall to create a Technology Learning Center for staff development and technical support
    - Expand access to "state of the art" end-user computers/equipment
    - Complete installation of a secure, college-wide communications network infrastructure.

2. Increase **opportunities** for faculty and students **to use** education technology.
    - Create a Technology Learning Center including staff development programs and systems, and student technical assistants
    - Enhance student services functions with the use of education technology

3. Develop a system for **continued planning** for, **evaluation** of, and **ongoing funding** for education technology.
    - Establish a Teaching and Learning Technology Roundtable
        - Support annual and ongoing planning , including evaluation
        - Establish and maintain funding for education technology
    - Create an Education Technology Office.

NEEDS FOR INFORMATION TECHNOLOGY AT CCSF

This plan specifically addresses the need for *education* technology at CCSF. Other uses of information technology at CCSF, particularly administrative uses such as office automation, require separate planning documents. However, the plan recognizes that **coordination** between these two major areas is essential, especially when common equipment is utilized (e.g. shared network servers). Additionally, departments and schools may want to develop discipline-specific plans for using education technology.

With the implementation of this plan, access to and support for the use of education technology by CCSF students, faculty, and staff will greatly increase. The plan recognizes the need for ongoing planning to accommodate future changes in technology and its applications, as well as increased usage within the college.

I. INTRODUCTION TO THE PLAN

A. Mission Statement

City College of San Francisco is increasingly aware of the benefits to be obtained from using ***education technology***[*]. As ***information technology*** grows, there will be increasing opportunities to adopt these new capabilities into the curriculum in both pedagogically sound and innovative ways. To the extent that CCSF is able to take advantage of these technologies, we will better serve our campus constituencies and, therefore, the public at large. To this end, these technologies must be available for use at the college and accompanied by the necessary training and support.

B. Scope

Currently at City College of San Francisco, a number of resources for education technology exist, and some faculty are able to take advantage of these resources. However, CCSF lacks a college-wide vision for systematically integrating education technology into the curriculum and Student Services. This plan documents the steps necessary to foster the appropriate use of current and emerging information technologies in both these areas. The plan considers the facilities, equipment, ***technical support*** and staff development needed to accomplish our technology goals for Teaching & Learning and Student Services. Appendix 1 lists other needs for information technology at CCSF not directly addressed in this plan including ***on-line*** access to CCSF data reports, travel forms, and grade forms. Although not directly discussed, implementation of this plan will provide a general physical foundation and organizational structure for these and other uses of information technology.

C. Premise

This plan proceeds under the premise that we should support and foster a wide array of individual faculty initiatives, while developing coherent school- and department-based plans for the use of education technology collegewide. Faculty will have the opportunity to become familiar with how education technology can benefit students. Emerging faculty and student interest and skills will influence these school- and department-based plans. A series of strategies for using education technology to improve Student Services is also presented in this plan. Appendix 2 lists some basic assumptions made in developing this plan.

[*] ***NOTE: Words in bold and italics are defined in the Glossary.***

D. Goals

Three major goals for this plan are:

1. Provide the physical infrastructure and technical support necessary to make education technology accessible and useful for faculty, staff, and students.
2. Increase opportunities for faculty and students to use education technology.
3. Develop a system for continued planning for, evaluation of, and ongoing funding for education technology.

In Section III, each of these goals is discussed and presented with its objectives. In Section IV, these objectives are broken out into a three-year implementation plan. If implemented, this plan should improve the nature of education at CCSF.

E. Student Outcomes

As a result of implementing this plan we expect our students will:

- acquire a basic level of computer literacy
- work with state-of-the art computing equipment available on all our college campuses
- access relevant student services data electronically (e.g. course enrollments)
- access personal CCSF data electronically (e.g. unofficial transcript)
- access information both on the campuses and via ***modem*** hookups from home computers
- communicate, via the ***Internet***, with fellow students as well as faculty here and at other campuses around the world
- participate more actively in their classes
- access tailored instruction and undertake more self-initiated learning.

II. BACKGROUND INFORMATION

A. State of Our Institution

In requesting this plan be written, the Master Plan Committee acknowledged that CCSF does not currently have organized resources to sufficiently support the use of education technology. This plan outlines the necessary structural supports and administrative processes needed for coherent and efficient incorporation of education technology throughout CCSF. Additionally, it examines facilities, equipment, technical support and staff development needs. The following is a list of some **current limitations**:

- Physical infrastructure to connect ***workstations*** to the college's main ***servers*** and the Internet, including:
    - * lack of ***network*** and/or telephone lines in most classrooms
    - * lack of network and/or additional telephone lines in faculty and staff offices
    - * absence of network interconnectivity within and between campuses
    - * insuffient or inadequate network and/or telephone lines in labs and other areas
- Workstations for faculty, staff, and students:
    - * insufficient number of workstations compared to the number of ***users***
    - * aging workstations
    - * absence of standardized ***software*** and ***hardware*** on college workstations from one lab to another, and from one campus to another (including computers located in offices, labs and classrooms)
- Personnel to support the use of education technology:
    - * insufficient coordination and ***technical support*** personnel for efficient and effective use of all workstations
    - * insufficient training and staff development for faculty and staff in the use of education technology
- Administrative structure and interest:
    - * insufficient coordination between college groups such as ITS, the Computer Policy Committee (CPC), the Internet Users Group (***IUG***), the Intech Users Group (ITUG), and faculty from the Computer and Information Science (CIS) department and other departments.

A detailed inventory of the following is currently being collected. See Appendix 3 for the information available to date:

* *Number and location of student computing labs and the quantity and quality of their equipment*
* *Computer orientation/training available to students through labs and formal courses*
* *Classroom and student services education technology facilities*
* *Computer networks, local and collegewide*
* *Number of faculty standalone computers*
* *Number and location of faculty computing labs and the quantity and quality of their equipment*
* *Staff development facilities for education technology (how current, where located, how standard)*
* *Staff development offerings for education technology including formal and informal training*
* *Number of personnel available for technical support (for labs, workstations and networks), staff development, and other education technology needs*

As the number of faculty and students using computers continues to grow, the gap between instructional needs and available resources grows wider. The demand for a collegewide network, Internet access, and more modern workstations has increased. Many faculty and staff have purchased their own computers due to the lack of institutional recognition of their computing needs. Faculty are also purchasing their own software to access the Internet. Last year, ITS estimated that $2.5 million would be required to equip each of CCSF's 2,000 faculty with a personal desktop workstation with minimal ***CPU*** and hard disk capacity.

The cost of providing computer access to faculty and students underscores the need for both open computer facilities on all campuses and any discounted personal computer purchases the college can facilitate. The socio-economic profile of our student body makes it impossible to *require* that students own a personal computer. Even without a requirement, though, the number of students who own a computer will probably increase with the continuously increasing business and personal use of computers for word processing, Internet access, and other computer functions.

Currently the number and quality of college-owned workstations available to students are insufficient. In open student labs currently we staff 21,773 open seat hours per week for computing use at 34 labs collegewide. (Additionally, there are a small number of department-specific efforts to provide access to computers.) Compared to the 460,000 weekly student contact hours CCSF supports, this amounts approximately .048 hours lab time per student class hour. On average, if all students used computers for all of their classes, a student could use a computer for **2.8 minutes** per class hour. More realistically, if only one-quarter of courses required regular computer use, a student could use a computer for approximately 11 minutes per class hour. Only 34% of lab computers are capable of running a Windows operating system. Even fewer of these workstations could reasonably support ***multimedia*** software or provide effective Internet access, if the college had a network through which to access the Internet.

Two FTE personnel in ITS specifically support academic uses of technology. Officially, one FTE is focused in staff development, the other on programming for special projects. In reality, these two individuals also support many administrative functions. Education technology needs require total concentration of more than two FTE. Some faculty and staff pay to receive staff development from providers such as U.C. Extension. Currently CCSF offers one introductory course in multimedia. (Recently an interdepartmental committee presented the Curriculum Committee with a proposal to establish a certificate program in multimedia studies.) However, faculty and staff cannot yet take such courses for free.

This section reveals our current computing inadequacies. However, if we are guided only by these needs, we will fall short of our mission statement. The increasing interest of faculty, students, and staff indicate a widespread belief that education technology can and should be used to enhance education.

B. The Purpose of Education Technology

Education technology can be used to:

- Develop a student's computer literacy for increased viability in 4-year college and/or place of employment
- Reduce student confusion by providing a single source for consistent student services information in response to one or any number of queries
- Increase student responsibility by expanding access to student services information and putting the information directly into students' hands (i.e., information available from home via modem, on campus during or after office hours via kiosks)
- Promote better decision-making and counseling through increased access to student services information
- Provide more opportunities for students to interact with each other, their instructors, and the local and global on-line community
- Enhance instruction both inside and outside the classroom
- Create opportunities for students to be more active learners
- Create a more flexible curriculum that can be tailored to specific student needs

For an expanded discussion of the uses of education technology, see Appendix 7.

Faculty Interest.

In Spring 1994, two surveys distributed at CCSF collected information about faculty interest in education technology. Below are some general observations made according to the survey responses. Appendix 4 contains more details about the surveys and the responses.

Results from the CCSF-developed "Professional Development Needs Assessment Survey" indicate that while almost 75% of faculty consider their level of computer expertise to

be beginner or intermediate. 11% consider themselves to be advanced users. 14% do not use computers. Computer skills do not vary with years of employment (a proxy for age). Computer skill-level and platform (IBM-clone or Macintosh) do vary by school.

Faculty indicated their interest in each of 42 separate topics ranging from student discipline, to department budgets, to education technology. Overall, faculty indicate relatively high interest in topics involving technology or implying that classroom and curriculum structure may be changing. (Faculty with more computer expertise express *even higher* interest in technology-related topics.) One area of exception is distance learning which garnered the least interest of the 42 topics presented.

The nationally distributed "Technology, Teaching and Scholarship Project Faculty Survey" posed 70 questions about available computer resources, institutional support and uses of education technology. CCSF faculty cite enjoyment of teaching and creativity as the most important reasons why they use education technology. Most faculty believe that "by the year 2000," education technology will change they way they teach their classes. Immediate interests include the Internet and word processing.

In terms of college resources, most faculty believe that expanding the campus network should be a college priority. Hardware and software purchases and upgrades and access to CD-ROMs and multimedia are also cited as major institutional problems. Although faculty are overwhelmingly happy with the current level of computer courses offered, most believe there should be more of them. Few faculty believe that CCSF currently rewards innovative teaching, although this was not cited as the most pressing problem.

Student Interest.

Students will benefit directly and indirectly from the increased use of education technology. With today's demands of work and family, students need improved access to student services information and reduced lines for services. We are unable to provide additional staff to meet this demand so students will have to take a greater role in their educational planning and decision-making through education technology.

Most CCSF students expect to have access to computers to complete their course assignments. Many students are either already computer literate or are specifically interested in becoming computer literate. CIS faculty indicate that their courses have waiting lists; students know that computer literacy is a valuable commodity in the job market, as well as a useful, if not necessary, skill in higher education. CCSF recently adopted a Computer Literacy requirement for students receiving Associate degrees. In the future, vocational programs may want to adopt analogous requirements determined according to industry and labor expectations. Although not all students come to CCSF expecting to use computers, students enrolled in courses which utilize computers have responded positively.

An increasing number of alternative providers of education are incorporating information technology into their curriculum. If students find that these alternate providers can better meet their needs, we will experience enrollment decline. CCSF must strengthen its services to better meet our students' academic needs.

III. THE PLAN: GOALS & OBJECTIVES

Goal 1. Provide the physical infrastructure and technical support necessary to make education technology accessible and useful for faculty and students.

The physical infrastructure includes three main areas: the equipment, the connections between equipment, and technical support personnel to install and maintain both the equipment and the connections. The physical infrastructure enables **access**. "User-friendly," centralized and decentralized, campus and home, individual and classroom access to education technology must be available. Access to stand-alone computers is no longer sufficient for our information needs. A network supports many things including communication via ***electronic mail*** (e-mail), access to information repositories from the local CCSF library to the global ***World Wide Web*** (WWW), reduction in software costs and increase in software compatibility by using network-licensed software, shared hard disk space and peripheral hardware such as printers.

All Phelan campus buildings must be connected to a fiber-optic backbone. (Given current technology, local technicians do not consider a wireless network to be preferable.) Once the backbone is completed, faculty offices, computing labs and ***smart classrooms*** can be connected to the network. Microwave transmitters or some comparable technology can connect Phelan and the other nine campuses. Workstations connected to this backbone will provide students, faculty and staff with Internet and e-mail access, as well as on-line access to databases in the new Library and Learning Resource Center.

A network requires both ***server*** and ***client*** computers. Server computers must be large enough to handle e-mail accounts for students, faculty, staff and administrators. These machines also house the CCSF databases which contain information relevant to Student Services. For ease of use, the client computers must be capable of supporting ***GUI*** network access.

As an interim step prior to connecting all faculty offices to an integrated campus network (which requires wiring inside the building), a branch faculty computing lab will be established in each building. These labs will meet the computing needs of part-time faculty and faculty without office space for a computer. The labs will also support the specialized computing needs of departments in that building. Eventually, the branch faculty computing labs will house a local server(s) connecting individual offices to the collegewide network. Any other equipment, such as routers and hubs, may eventually be stored in secured portions of the labs, where the primary connection to each building will be located.

Faculty and student computing labs will be accessible to individuals with disabilities. We should also support home access to computers for students by facilitating the purchase of low-cost computers. (Some colleges have developed a computer loan program for this purpose. Given the size of our institution, such an arrangement may be unrealistic for CCSF.)

Basic staff development will offset some technical support needs by providing users with "trouble-shooting" skills. However, users should not be expected to become experts; individuals will abandon technology in frustration without sufficient technical support. An appropriate level

of staffing is essential for the optimal usage and maintenance of technical equipment. Both the ratio of staff to equipment and kind of support offered are important. A regularly-staffed help desk is necessary to meet the needs of many faculty, along with assistance provided in each of the labs. A traveling technical support person is necessary particularly for classroom situations in cases of "emergency".

Student assistants, in addition to technical support staff, need to be utilized to meet current and increasing needs. Technical support is expensive, so many colleges train students to provide additional technical assistance in computing labs which is advantageous both for the college and for the students. (See Appendix 5 for a description of how this has worked at another college.) The college acquires more staff and the students acquire "free" training and excellent job experience. Training and oversight costs must be budgeted for the student assistants. The training could be done in the newly constructed smart classrooms.

ITS staff will need additional training or retraining to meet the new demands of education technology. When appropriate, additional personnel must be hired. In some instances, personnel not in ITS may be expected to assume new roles, such as network administrator, in support of information technology. These personnel need an appropriate level of training and support. New job classifications or reinterpretation of existing classifications will be required to formalize these arrangements.

Objectives for Goal 1:

01. Complete installation of a secure, college-wide communications network infrastructure to support shared computing resources. This requires the following:

- Fiber-optic backbone on Phelan campus, including all necessary hardware such as hubs and routers and locations for these. (Plans should account for the compatibility of new cabling with existing cabling, including coaxial cabling)
- Microwave transmitters between campuses, or other means of connectivity such as fiber when feasible and affordable
- Sufficient server computers to support the network and locations for these servers. (Servers should be both flexible and expandable)
- Continuous network service with less that two hours "down time" each month
- Sufficient modem lines for remote ("dial-up") access
- Sufficient band-width to link to Internet
- GUI Internet browsers on campuses and ***SLIP*** or ***PPP*** connections for remote access
- E-mail accounts, with sufficient disk space, for all faculty, staff and students
- ***Wired classrooms*** with a single network connection each for display or demonstration purposes
- Video cabling should be provided, as appropriate, in addition to computer network cabling

02. Expand access to "state-of-the-art," end-user computers and related equipment by doing the following:

- As soon as possible, the TLTR (see Goal 3) should develop standards for numbers of work stations per FTE faculty and staff
- Expand existing facilities in Batmale (Phelan campus) to create a centralized Technology Learning Center (TLC) for staff development and technical support. The TLC will comprise two separate rooms: one training room and one lab for individual work. (Eventually may expand into its own building.) (See Goal 2, Objective 1)
- Develop and complete decentralized, staffed, open computing labs for both faculty and students at all campuses. Create department-specific labs when appropriate; otherwise, encourage interdisciplinary use. Have workstations available to all faculty and an appropriate number of workstations available per FTE student for each campus
- Make existing lab resources more available (e.g. increase hours of operation)

- Convert traditional classrooms, as needed, into ***smart classrooms*** with workstations for each student in addition to a faculty computer with a large screen display
- Add workstations to faculty and staff offices, including ***laptop*** computers
- Provide portable Multimedia workstations with ***LCD***s for classroom use
- Provide accessories such as laser printers, ***scanners***, ***OMR***s

03. Provide technical support for offices, labs, and classrooms including:

- 1 FTE technical support per 60-90 workstations, including:
  * Help Desk and on-line support available from 6 a.m. to 10 p.m., weekends 8 a.m. to 8 p.m.
  * Technical support on-site in faculty and student labs, supplemented by student assistants (See Goal 2, Objective 3)
  * Traveling technical support person for classrooms
- ***Network administrator(s)***
- Programmer(s)
- ***Instructional designer(s)***
- ***Web administrator(s)***
- ***System administrator(s)***

Goal 2. Increase opportunities for faculty and students to use education technology.

Faculty use of education technology depends on comfort- and skill-levels as well as access to the necessary equipment. Faculty must feel comfortable with not only their own technology skills and knowledge, but also those of their students. Further, they must feel confident that any gaps in their skills and knowledge can be filled through access to technical support (See Goal 1, Objective 3) and training.

Physical access to a computer is meaningless without training. To avoid a situation where computers become "expensive paperweights," a wide-ranging, timely, systematic Staff Development Program is critical to the successful implementation of this plan. Training must meet the variety of individual interest-, expertise- and comfort-levels of faculty. Various methods of delivery can be used including computer-based tutorials (***CBT***s), video, expert and peer training. Delivery can be one-on-one or in a group, in the privacy of an office, in an open lab or in a classroom setting. CB training can be particularly useful for someone just starting; a computer (client or stand-alone) can be used at any time with limited oversight in a lab situation.

Training must begin immediately upon the installation of equipment to avoid a number of problems. Equipment can become outdated before it can be used. Untrained users can become easily frustrated. Untrained users can also create technical problems through their lack of knowledge by, for example, accidental erasure of a critical system file. Computers may also sustain unnecessary wear-and-tear due to misuse. In this scenario, the technical support workload has increased in two ways: there are more technical problems and technical support personnel end up performing the function of staff development on an ad hoc basis when they fix the problem.

Realistically, not all faculty will be interested in, capable of and/or comfortable using education technology; participation must be voluntary. We should not expend all our energy trying to "get everyone on board." We should avoid a situation where beginners get all the attention and faculty already using education technology are overlooked. For those faculty who lack basic computing skills, a successful experience in learning about one aspect of technology can increase interest in learning more about education technology. Various delivery methods, sites, and times (including nights and weekends) for staff development should be used since comfort with methods will vary. Some faculty may prefer to learn privately while others may find it useful to learn with their peers.

Ongoing and higher-level training and technical support will be critical to the appropriate use of education technology and development of classroom materials. This requires both the proper equipment and personnel. Currently, individual personnel are often informally considered the 'resident expert' on a particular technology, but the College does not draw on this expertise in a systematic or effective way. Training needs will evolve and increase over time as technology advances and applications to education become more widespread. Some staff development should be done by school or department, since the need for and uses of education technology varies. (This may require a needs assessment.) Department-specific training could take place in the TLC or in department-specific labs. Desired levels of technological use and literacy may vary by school and department (See Goal 3, Objective 8). Eventually, the Staff

Development Program should develop a series of training sessions for systematically achieving school- and department-level targets for technological literacy.

For training (and technical support) to be up-to-date, CCSF must support its in-house personnel in continually upgrading their information technology skills. Even with this support, CCSF may not be able to meet all faculty staff development and student training needs, especially in the newest and most highly specialized technology areas. When necessary, strategic partnerships with industry and other institutions may be an economical way to provide site-based, hands-on training using state-of the art equipment which cannot be obtained through standard acquisition. Additionally, when appropriate, CCSF may continue to create new courses and programs specifically to teach information technology to our students. Our partnerships with business and industry may assist in determining the needed courses and programs.

Students enrolled in courses using education technology must possess a basic level of computer literacy. For courses which require computer use, faculty may consider putting an advisory on the course. Traditional courses should be available for students who do not want to use education technology. At CCSF, the main student lab (ICL1) makes a mini course available at the beginning of each semester and also on video tape. A multimedia presentation created by CCSF could be developed for future use.

Objectives for Goal 2:

01. Create the physical infrastructure as provided in Goal 1. In particular, the TLC will provide a location for and maintenance of:

- Staff development, particularly in new technologies and multimedia (See next objective)
- Digitized presentation development on multimedia workstations
- Digitized publishing
- Library of reference materials and magazines
- Bank of software for Teaching & Learning, including locally-developed software
- New software evaluation
- Carts with computers and LCDs
- Sharing of expertise among faculty

02. Implement a systematic Staff Development Program for faculty, staff and students. This program must meet the needs of a wide range of users by providing:

- Training at a number of levels:
  * Initial training
  * Continuous upgrading of skills
  * School- and department-specific training
- Incentives for learning about and use of education technology:
  * funding for conference attendance (information gained must be shared through demonstration, presentation or newsletter, see below)
  * equipment (on loan to individual, when project completed given to department)
  * flex credit
  * grant stipends
  * faculty exchange programs on campus, with other colleges and "internships" businesses and industry
- Information about practices regarding education technology and technical issues:
  * Demonstrations of education technology in action
  * Leadership/direction in developing evaluation practice
  * Newsletter which will include technical tips, findings regarding pedagogy and student outcomes related to education technology, references, information about informative sites, demonstrations, conferences
  * Tech-tips delivered regularly over e-mail and electronic discussion groups

    - * Frequently Asked Questions (FAQ) and technical information stored on local servers
    - * Information about health related issues
  - Personnel, both staff development and technical support, who are knowledgeable about current education technology and its uses

03. Train students in the use of computers and other education technologies
  - Establish a program to train students to work as paid computing lab assistants
  - Develop multimedia presentations designed to give a student the basic computer literacy, recommended especially when a student is enrolled in a course which uses education technology
  - Develop additional information technology courses and programs

04. Improve and enhance various Student Services (See next page)

4a. Improve administrative decision-making for Student Services

- Provide on-line matriculation, enrollment, and counseling data

4b. Generally, enhance access to information for students, counselors and staff in Student Services in order to reduce the lines for information and service at current delivery sites, and support students in taking greater responsibility for knowing college polices and procedures

- Install electronic student kiosk stations at all campuses with at least five strategic locations at the Phelan campus. Students will have access to the following types of information:
  * general CCSF information including campus maps and calendar of events, class schedule and course enrollment, prerequisite and transfer information and frequently asked questions
  * student-specific information including grades and transcript information
- Expand the number of home page sites on the e Web to include student and instructional service locations
- Develop multimedia orientations systems and make the information available in a variety of formats, especially for these audiences: athletes, transfer students, basic ESL, vocational students and part-time enrollees

4c. Develop a more student-responsive Admissions & Records enrollment process

- Purchase telephone registration system (currently lease from Pac Bell)
- Extend telephone registration to include telephone drop/add
- Implement a scannable application for admission
- Improve Admissions & Records storage of student records
  * purchase a document imager to record all inbound transcripts on disk and upload to server for access by counselors

4d. Develop electronic counseling support systems

Use for student educational plans; accessing transfer articulation agreements; college/career information (Eureka or equiv.); student demographic data; student academic data: credit/non credit and transfer credit; associate degree, CSU, and IGETC audits; access to inherent sites for more detailed academic information including college catalog, time schedule, and college calendars; student academic progress checks/ probationary status; student appointment scheduling and tracking of service provided counselor log of each assigned student.

- Install computers and provide ***GUI*** Internet access
- Develop a schedule of staff development training on new software and equipment
- Develop a plan for the maintenance of articulation and degree audit information

4e. Improve interactivity of counseling support services among the campuses

- Establish counseling screens with common elements for all units and campuses
- Provide read access for student screens in financial aid, admissions and records
- Establish computer user advisory group with appropriate representatives to discuss any needed changes in computer support in Student Services

4f. Develop systems to support distance orientation and counseling services

- Explore the feasibility of establishing cameras and computers at appropriate locations to support distance counseling throughout the San Francisco
- Develop a counselor Question and Answer network on e-mail for student inquiry
- Develop a computerized counseling scheduling system of student appointments in support of all counseling units
- Conduct staff training on security measures related to the confidentially of student records

4g. Support the collection and processing of data for evaluation of the counseling service delivery system

- Identify data elements needed to support the evaluation of counseling services for improvement
- Determine those data elements currently captured through use of computers and the degree to which these elements meet the evaluative needs of counseling
- Ensure all screens developed to support counseling services include the necessary data elements to support review and evaluation
- Develop a counseling ***MIS*** database in support of evaluation of the effectiveness of the service delivery system of General Counseling, Career Development and Placement Center and EOPS

4h. For Testing, reduce test anxiety for new students and create a more responsive testing process

- Explore the feasibility of computerized testing. Computerized testing sessions can be as short as 15 minutes compared to the current two hour tests. Students could proceed with test results to customized orientation sessions, especially for basic skills and career assessment.

4i. Shorten the award processing time for financial aid applicants

- Install the Banner financial aid software.

Goal 3. Develop a system for continued planning for, evaluation of, and ongoing funding for education technology.

We propose that an Education Technology Office (ETO) be established to be responsible for actively supporting the use of information technology for Teaching and Learning, and Student Services, beginning with the implementation and oversight of this plan. Responsibilities of this administrative office would include coordinating college-wide decision-making regarding education technology. To this end, the ETO will work with existing groups such as ITS, the Computer Policy Committee (CPC), Internet Users Group (IUG), Intech Users Group (***ITUG***), Master Plan committee, and Staff Development, as well as the following departments: Audio Visual, Broadcast Media Services, CIS, Learning Assistance, and the Media Center. Initially, the office would be part of ITS, but after a year of funding and implementation, the costs and benefits of becoming a separate department should be examined.

A Teaching and Learning Technology Round Table (TLTR) has been established with representation from faculty, administration, staff and students to advise the ETO. Some of the groups named above, specifically the IUG, ITUG, and the academic portion of CPC will be folded into the TLTR as working groups in order to better coordinate education technology activities at CCSF.

Located in or near the TLC, the ETO will be the ultimate place in the college to go with a question about technology for educational purposes. To function, the ETO must be staffed and receive an annual budget. Staffing the ETO may require some restructuring of the existing Information Technology Services (ITS) department. Education technology personnel should be differentiated from personnel responsible for administrative aspects of information technology at CCSF.

Some specific implementation issues follow. The ETO would either be directly responsible for these or oversee them. Through the annual and ongoing planning process, other issues may be identified in the future.

Establishing and maintaining funding is the most basic element of supporting education technology. Without funding we will not have the physical infrastructure to proceed. Many funding routes are open and probably all of them should be pursued. Providing direct services to students such as in a lab setting may be funded differently than wiring classrooms or providing faculty with equipment. For the former, perhaps the most controversial solution is instituting a student fee. Many colleges nationally have begun imposing such fees, usually an Internet account fee. Current state regulations would have to be changed to permit user fees. Another option is to use an ***ISP*** such as Sprint to provide Internet services to our students. In this case, some costs to the college for Internet services can be reduced or eliminated.

For all education technology uses, leasing equipment should be considered. (Note: Leasing requires a line item in the budget.) For purchased equipment, three-year, on-site, warrantees may also cut down on costs, particularly staffing costs, over time. Requiring a 10-20% addition to the cost of any hardware item may be one way to approximate institutional costs for support services for that item. Downstreaming, a practice that redistributes existing

equipment when newer equipment is purchased, can be an effective means of maintaining direct equipment costs; however, it is important to remember that older equipment is harder to maintain and requires more technical support. External funding and sponsoring should also be pursued.

CCSF must evaluate the uses and effects of education technology, including evaluation of any changes in student outcomes resulting from the use of education technology, assessment of individual faculty and departmental needs for and uses of education technology, and assessment of student satisfaction with courses using education technology. The Decision Support System currently being developed should aid this process by providing on-line student data. Evaluation-- in addition to an ongoing equipment and facilities inventory indicating the location, usage, age and capacity of workstations at CCSF-- will be helpful for annual and ongoing planning efforts. Some other information useful for planning could be collected through surveys. College surveys should include questions on faculty and student campus-based and home computer use. Surveys could help document progress toward achieving faculty training goals and highlight outstanding training needs.

Guidelines and standards for education technology should be developed, including usage guidelines and, when beneficial, basic standards for hardware and software purchases. (Instructional software standards apply primarily at the school- or department-level.) Standards for hardware (both Macintosh and IBM-compatible) and software purchases will allow for more efficient staff development and technical support since staff will be able to maintain extensive knowledge of a modest number of products rather than trying to maintain some minimum expertise for every product on the market. The college's capacity to rely on internal expertise will be increased which, in turn, will increase each user's efficiency and facilitate the sharing of information and documents.

Hardware and software acquisition plans and renewal schedules will also help keep CCSF current and further minimize the need for technical support by reducing the proportion of old and failing equipment. Consideration should be given to purchasing laptops wherever appropriate to allow for more versatile use. These standards will allow for affordable, bulk upgrades in the short-term and help promote longer-term technology planning. Ideally, standard machines would also be available at reduced costs to students through educational discounts and bulk purchases.

Networks must also be maintained and periodically upgraded or replaced. Policies for system management must recognize any physical limitations of the network; these may include restrictions on the range of uses and access prioritization.

Many other policy issues will arise as education technology becomes more widely used. Equipment needs to be secured from theft. In addition, the regular operation of the equipment-- the software, any data or other files on the hard drive-- needs to be secured from both unintentional and intentional destructive activity. When the latter, commonly referred to as "hacking", does occur, the college should have established procedures for dealing with the individual(s) responsible. See Goal 3, Objective 4 for some other policy issues.

Each school and department should determine its education technology needs and expectations, particularly when they are different from or in addition to the overall standards described above. Most instructional software in discipline-specific; some hardware and networking needs may also differ from the standards. These needs and expectations, as well as

current uses must be documented to provide a factual basis for allocation decisions. One possible, initial venue for this planning is Program Review. Facilitated and coordinated school- and department-planning should begin with the next two years. School- and department-based plans should address specific education technology applications, their uses and desired student outcomes. Staff Development for each school or department will be determined by the faculty competency level required for its specific education technology applications. (For longer term planning, departments should consider whether to include these competencies in their hiring, promotion and/or tenure criteria.) These plans should be within established CCSF guidelines and minimum standards for education technology, and they should fit within the overall college plan framework.

CCSF must determine its long-term goals regarding distance education. To date most CCSF faculty have not expressed much interest in distance education; however, recently the Internet has altered the nature of distance education dramatically. (See Sections II.B., V., and Appendix 6) Given these new possibilities, we must ask again: Should distance education offerings be increased? Are faculty interested in teaching distance education courses? Are students interested in taking distance education courses? How many students are we "missing" because we do not have sufficient distance education offerings?

In addition to providing a forum for individual communication (e.g., office hours), whole courses can be offered on-line through the Internet and e-mail. On-line courses can easily be modified into distance education courses. Some faculty and students will feel more comfortable participating through written means; others will prefer the verbal discussions of a traditional classroom setting. Courses offered on-line can benefit from the variety of perspectives available globally. The best means of presenting a course will depend on the material, the course objectives, and the participants. In addition, CCSF should consider how on-line tutoring can be used effectively, and how voice mail and telecommunications can be used pedagogically.

The need for distance education may increase as CCSF services more students for whom jobs and/or families compete for their time. Students who are seeking short-term retraining may also prefer the convenience of distance education. These students may find distance education an acceptable alternative to a traditional classroom setting.

Objectives for Goal 3:

01. Develop and strengthen education technology

- Create an Education Technology Office (ETO), advised by a Teaching and Learning Technology Round Table (TLTR). The ETO will have its own staff and an annual budget which would deal with administrative issues including:
  * Coordination of college's education technology initiatives and groups
  * Involve students, as appropriate, in assessment and planning in technology
  * Oversight of implementation of this plan, including oversight of technical support staff and staff development program

02. Establish and maintain funding for education technology through the following:

- Bond issue
- Line-item in the annual SFCCD budget
- Grants including state matching funds, VATEA, block grants, private grants
- Consortial arrangements and articulation with other academic institutions and business entities
- Student fee for Internet account or ISP arrangement, developed in consultation with student government

03. Set up a structure for school- and department-based planning for education technology

- Determine discipline-specific needs
- Determine desired student outcomes
- Examine the possibility of creating education technology competency goals for faculty

04. Support annual and ongoing planning and evaluation, both college-wide and at the school and department levels

- Document how faculty use education technology
- Evaluate any effects education technology has on student outcomes
- Determine student satisfaction with education technology.
- Assess individual faculty and departmental needs regarding education technology
- Develop and maintain an ongoing equipment and facilities inventory which indicates the location, usage, age and capacity of workstations and other digital, video, and audio equipment
- Solicit information on home computer use

05. Develop guidelines and inform CCSF community about:

- Legal issues regarding curriculum development, ownership, use of final product

- Instructional load for on-line and distance classes
- Appropriate network usage
- Copyright laws for software and internet items
- Discipline of "hackers" and practices to avoid opportunities for hacking and other forms of destruction or theft of equipment

06. Develop a hardware acquisitions plan which standardizes purchases whenever possible and plans for cyclical upgrades and replacements:

- Purchase standard hardware (laptops provide the most versatile, portable use)
  * reliable manufacturer
  * sufficient hard disk space, memory and speed
  * appropriate network card
  * ***CD-ROM*** and other features as appropriate
- Establish an equipment renewal schedule, including network hardware, server and workstation hardware, software and peripherals
  * five-year replacement cycle (in staggered purchases)
  * five-year warranties
  * older equipment re-used as terminals and lower-grade computers ("downstreaming")

07. Develop a software acquisitions plan to standardize software purchases and subsequent upgrades of the selected software. Develop a list of software that will be "official" software for which CCSF will provide extensive technical support. (More modest support will be available for unofficial software.) Standards for most instructional software will be determined at the school- or department-level.

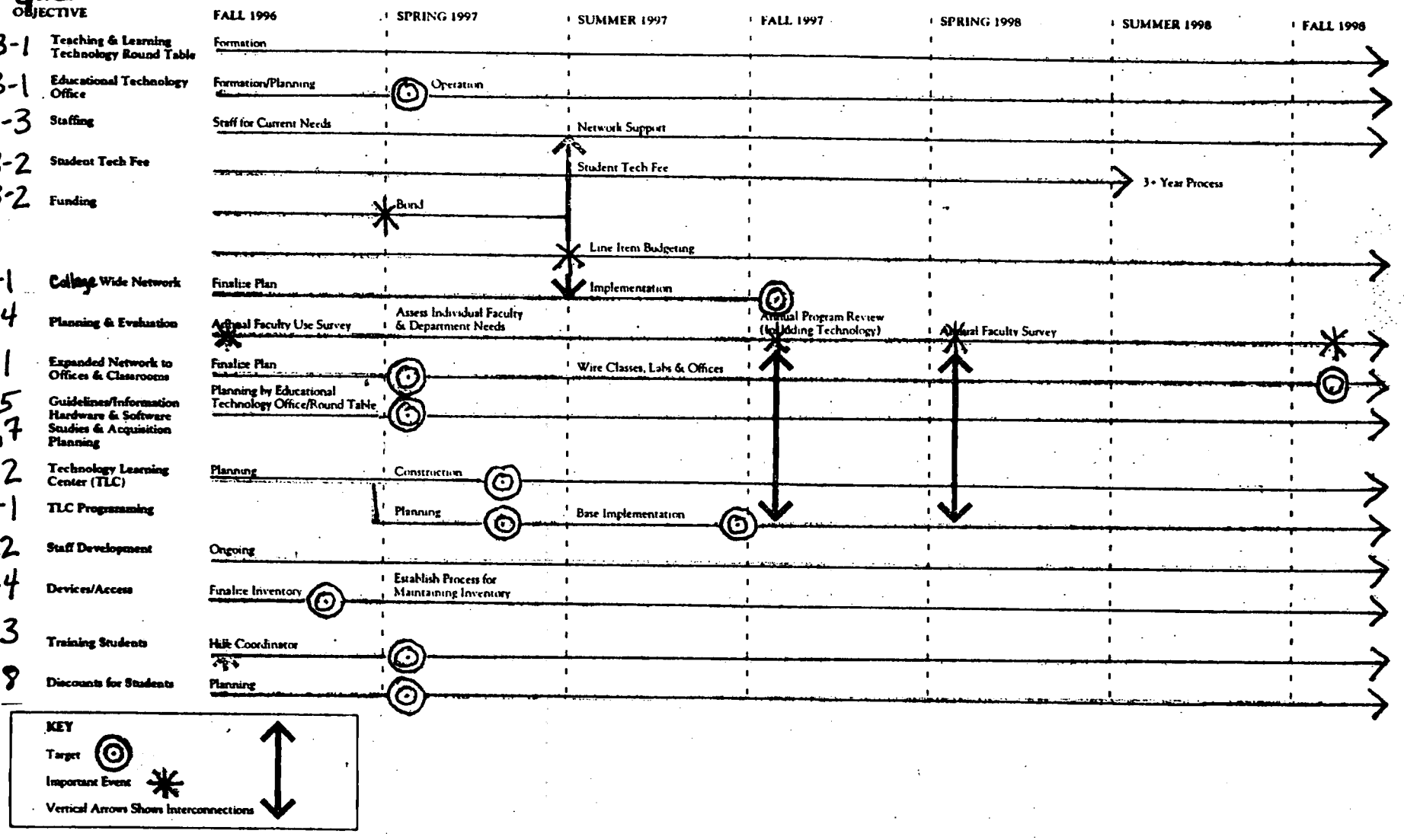
08. Make standardized computer and software packages available at discount to students and disseminate purchasing information to students

09. Examine distance education options and determine long-term goals

IV. IMPLEMENTATION TIMELINE

The timeline on the following page was developed by the Technology Strategy Development Team. For the purposes of this document, Goal and Objective numbers correspond with the preceding pages. (The original timeline is located in the 1996 CCSF Strategic Planning Process: Draft Plan Framework, pp. 12-13.)

This timeline and the preceding plan were developed during 1996. Changes in technology, educational theory and practice, student expectations, and funding, as well as other unforeseen changes, may alter the direction(s) CCSF chooses to take with regard to education technology. Continuous effort will be required to keep our technology and its uses current, efficient and effective to best meet the needs of our students.



Goal 2, Objective 4 has not been incorporated into this timeline.

APPENDIX 1

Needs for Information Technology at CCSF Not Covered in This Report:

This plan, Creating Opportunities: Using Information Technology in Education, is focused on the use of ***information technology*** for Teaching & Learning, and Student Services (***education technology***). This plan does not attempt to cover all the uses of and needs for information technology at CCSF. However, as stated in the introduction, the implementation of this plan will result in a general physical foundation and organizational structure that will support the use of information technology for purposes broader than those addressed in the plan itself.

Other areas which should be addressed include access to timely and accurate data, office automation, and, as discussed in this plan, school- and department-based plans. Specifically:

1. **CCSF Data: Management Information System (MIS)**

   Currently, CCSF is refining its data collection and reporting procedures to satisfy MIS data elements requirements of the State Chancellor's Office. In the process of being implemented by Information Technology Services (ITS).

2. **Professional and Business Operations**

   Currently, CCSF is updating its information system using the following products: Banner Student, Banner HR (Human Resources), Banner Finance, and Banner Financial Aid. Some automation of information transferal will result from implementing these products. However, training and equipment issues should be fully addressed in the next two years in order to make best use both of the products we have purchased and of employee time. Further, the information that is put into the system should be made available to faculty as well as staff and administration.

   - ⇒ Office Automation (e.g. electronic forms for travel, grades),
   - ⇒ Professional Integration (e.g. word processing for classroom handouts),
   - ⇒ Professional Participation (e.g. electronic forums to discuss college decision-making and ensure wider input from faculty, staff, students and administrators than through traditional shared governance committee meetings alone), and
   - ⇒ Information Flow (e.g. Decision Support System (DSS) for local distribution of MIS and other data)

3. **School- and Department-based Education Technology Plans**

   These plans will flow out of this Creating Opportunities Plan which focuses on creating (1) a general, college-wide physical and administrative infrastructure, (2) structures to support individual and department initiative, (3) centralized and coordinated planning and decision-making regarding collegewide use of education technology. Unlike collegewide planning, discipline-specific planning must take place at the school- or department-level.

APPENDIX 2

Basic Assumptions of This Plan:

1. Our goals and objectives should be relevant to furthering student learning and addressing student needs in the 21st century work force.
2. Our educational objectives should always be the main focus; technology provides tools toward meeting educational objectives and should not obscure the main focus.
3. Education technology will not be appropriate for all courses, all faculty members or all students. Traditional methods have worked in the past and will continue to be a part of education at CCSF.
4. Our traditional ways of working, thinking and learning must be re-examined so as to take full advantage of education technology; however, we should seek to apply proven technologies, and not invent new ones.
5. Education technology should be used, when appropriate, to supplement and augment traditional classroom instruction.
6. Our use of new instructional technologies will enable faculty to further individualize their instruction to meet particular student needs.
7. Our development of teaching tools provided by these new technologies will stimulate student interest and promote self-initiated learning.
8. Current evaluation measures must be revised to capture the impact of the changes technology brings.
9. This plan should comply with and support the CCSF Master Plan as well as with applicable State Chancellor's resolutions and mandates.
10. Administration and staff must also have access to education technology. Foster a campus climate where technology is used effectively.

APPENDIX 3

State of Our Institution, More Details:

Please note this section is currently being developed.

Computing Labs

Summaries and campus breakouts of the Instructional and Noninstructional Computing Lab facilities are located on the next 5 pages. In addition to the information presented on these breakouts, for the plan, we need to determine the following:

- department(s) to which the lab is affiliated, and who administers it
- number of Macintosh vs. PC computers (for PCs, breakout 386 or lower vs. 486 or higher); also, inventory other technological equipment available in the lab
- functions the lab serves, including whether it is never, sometimes, or exclusively used as a classroom (i.e. lab, classroom, lab/classroom)
- for student labs, do we collect ADA (i.e. for how many hours is a faculty monitor and is there a sign in sheet)
- hours the lab is open (from xx a.m. to xx p.m.)

The only **faculty computing lab** is Batmale 310. The following Departments have affiliated **student computing labs**. Student labs vary from each other in many respects. Some labs, such as the CIS lab in ICL1, are administered through ITS and are open to all students. In other cases, the department is directly responsible for administering the lab. Operating hours also vary: some labs are essentially used only during classrooms hours; others are open a wider range of hours:

* Architecture
* Behavioral Science
* Business
* Computer Information Sciences (CIS)
* Disabled Students
* Engineering
* Graphic Communications
* Math (currently being developed)
* Science
* Library (***Dynix*** stations)

Individual computers

A dated inventory exists for noninstructional machines used primarily by staff and faculty. It contains information on approximately 300 machines on Phelan campus. Each department will be asked to update the portion on the inventory specific to them.

Current instructional uses of computers

- The English Department has a word processing and term-paper writing facility, The Write Place, which is open to all students. Now located in the new library.
- ESL has a CALL (Computer Assisted Language Learning) classroom.
- Some ESL instructors at the Alemany campus incorporate computers directly into their teaching.
- Underprepared English and ESL students use the Learning Assistance Department Study Center's fourteen workstations equipped with educational software.
- Business Department classes at the Phelan, Downtown, John Adams and Southeast campuses use business-related software applications such as spreadsheets.
- The PIC Program at JAD trains displaced workers on how to use computers.

INFORMATION TECHNOLOGY SERVICES

1/5/96

SUMMARY OF NON-INSTRUCTIONAL LABS

CAMPUS	LOCATION	SEATS	OPEN SEAT HOURS/WEEK	% WINDOWS		REMARKS
1. Phelan	Write Place	35		100%		All Macs
2. Phelan	Learning Assistance	30		100%		All 486
3. Phelan	Reading Lab	10		100%		All 486
4. Phelan	Artx Room 265	32		100%		All Mac
5. Phelan	ITS Training Room 313	13	611	100%		CD, Internet
6. Phelan	Faculty Lab Room 310	8	376	12%		Low end Macs
7. Phelan	Architecture	15		100%		Auto Cad

INFORMATION TECHNOLOGY SERVICES

1/5/96

SUMMARY OF INSTRUCTIONAL LABS

CAMPUS	# ROOMS	# SEATS	OPEN [1] SEAT-HRS PER WEEK	% OCCUPANCY	% [2] WINDOW COMPATABLE	LOW [3] COST TO STANDARD CONFIGURATION	HIGH COST TO STANDARD CONFIGURATION
1. Phelan	7	264	7,826		38%	$259,400	$ 331,300
2. John Adams	9	204	4,794	75%	46%	$166,200	$ 199,400
3. Alemany	2	29	0	100%	- 0 -	$ 48,500	$ 58,200
4. Downtown	7	173	6,920	90%	16%	$210,100	$ 252,000
5. Chinatown	2	53	742	45%	- 0 -	$ 85,100	$ 102,100
6. Mission	4	78	741	45%	- 0 -	$123,000	$ 147,600
7. Southeast	3	67	670	25%	- 0 -	$105,500	$ 126,600
TOTAL	34	868	21,773		34%	$997,700	$1,197,200

1. Open = possible, but not necessarily available or unused. Demand is high.

2. Standard windows capability.

3. Minimum 486-33 DX with 8 MB and color monitor upgrades; Pentium 75 or Apple Power PC for replacements.

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INFORMATION TECHNOLOGY SERVICES
INSTRUCTIONAL LABS BY CAMPUS

1/5/96

CAMPUS	LOCATION	SEATS	OPEN SEAT-HRS PER WEEK [1]	% OCCUPANCY	% FULL WINDOW [2]	LOW COST TO STD CONFIG [3]	HIGH COST TO STD CONFIG
1. Phelan	A. Batmale 301	99	6,138		12%	$134,900	$161,900
	B. Science 8	26	832		38%	$ 26,000	$ 31,200
	C. Cloud 109	26	572		100%	- 0 -	- 0 -
	D. Cloud 110	26	- 0 -		100%	- 0 -	- 0 -
	E. Cloud 111	35	- 0 -		- 0 -	$ 59,500	$ 71,400
	F. Cloud 115	26	- 0 -		- 0 -	$ 39,000	$ 46,800
	G. Cloud 116	26	364		100%	- 0 -	- 0 -
Phelan	Sub-Total	264	7,906		38%	$259,400	$311,300
2. John Adams	A. Room 100	28	658		100%	- 0 -	- 0 -
	B. Room 104	14	329		57%	$ 10,200	$ 12,200
	C. Room 220	24	564		- 0 -	$ 36,000	$ 43,200
	D. Room 214	26	611		- 0 -	$ 39,000	$ 46,800
	E. Room 221	24	564		- 0 -	$ 36,000	$ 43,200
	F. Room 228	28	658		100%	- 0 -	- 0 -
	G. Room 231	26	611		8%	$ 36,000	$ 43,200
	H. Room 234	28	658		100%	- 0 -	- 0 -
	I. Room 401	6	141		- 0 -	$ 9,000	$ 10,800
John Adams	Sub-Total	204	4,794	75%	46%	$166,200	$199,400

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INFORMATION TECHNOLOGY SERVICES

1/5/96

INSTRUCTIONAL LABS BY CAMPUS

CAMPUS	LOCATION	SEATS	[1] OPEN SEAT-HRS PER WEEK	% OCCUPANCY	[2] % WINDOWS	[3] LOW COST TO STD CONFIG	HIGH COST TO STD CONFIG
3. Alemany	A. Room 101	4	- 0 -		- 0 -	$ 6,000	$ 7,200
	B. Room 303	25	- 0 -		- 0 -	$ 42,500	$ 51,000
Alemany	Sub-Total	29	- 0 -	100%	- 0 -	$ 48,500	$ 58,200
4. Downtown	A. Room 420	26	1,040		- 0 -	$ 39,000	$ 46,800
	B. Room 422	27	1,080		- 0 -	$ 40,500	$ 48,600
	C. Room 426	20	800		25%	$ 22,500	$ 27,000
	D. Room 514	28	1,120		- 0 -	$ 42,000	$ 50,400
	E. Room 515c	29	1,160		- 0 -	$ 43,500	$ 52,200
	F. Room 516	28	1,120		100%	- 0 -	- 0 -
	G. Room 622	15	600		- 0 -	$ 22,500	$ 27,000
Downtown	Sub-Total	173	6,920	90%	16%	$210,000	$252,000
5. Chinatown	A. Room 100	29	406		- 0 -	$ 44,300	$ 53,200
	B. Room 103	24	336		- 0 -	$ 40,800	$ 48,900
Chinatown	Sub-Total	53	742	45%	- 0 -	$ 85,100	$102,100

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INFORMATION TECHNOLOGY SERVICES

1/5/96

INSTRUCTIONAL LABS BY CAMPUS

CAMPUS	LOCATION	SEATS	1 OPEN SEAT-HRS PER WEEK	% OCCUPANCY	2 % WINDOWS	LOW 3 COST TO STD CONFIG	HIGH COST TO STD CONFIG
6. Mission	A. Room 409	24	228		- 0 -	$ 36,000	$ 43,200
	B. Room 412	24	228		- 0 -	$ 36,000	$ 43,200
	C. Room 414	20	190		- 0 -	$ 34,000	$ 40,800
	D. Room 405	10	95		- 0 -	$ 17,000	$ 20,400
Mission	Sub-Total	78	741	45%	- 0 -	$123,000	$ 147,600
7. Southeast	A. Room 309B	24	240		- 0 -	$ 36,000	$ 43,200
	B. Room 309A	18	180		- 0 -	$ 27,000	$ 32,400
	C. Room 4xx	25	250		- 0 -	$ 42,500	$ 51,000
Southeast	Sub-Total	67	670	25%	- 0 -	$105,500	$ 126,600
All	**Total**	868	21,773		34%	$997,700	$1,197,200

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APPENDIX 4

Faculty Interest in Education Technology: Responses to Two Surveys

To develop a feasible, realistic Staff Development Program we must accurately gauge current faculty knowledge, skills and interest in the relevant technologies. The following section examines where interest in technology exists: Are technologically skilled faculty more interested in classroom-based and other technologies? Are these the only faculty members who are interested in technology? Staff development has a key role in areas where there is high or moderate interest but little practical knowledge.

Two surveys, both distributed via campus mail in Spring 1994, provide data to begin addressing these questions.

PROFESSIONAL DEVELOPMENT NEEDS ASSESSMENT SURVEY

The "Professional Development Needs Assessment Survey" was distributed to all members of the CCSF community, but only faculty responses will be considered here. The survey contains two questions about self-professed computer knowledge. Other questions examined here regard topics of interest; survey respondents rated their interest in a number of items to "be explored during professional development activities."

Of the 1657 faculty members employed by San Francisco City College District (SFCCD), 656 faculty members responded -- a 40% response rate. The respondents are generally representative of the faculty by school and campus (see Graphs at the end of this section). A slightly higher percentage of full-time faculty responded than are employed by the district; half the respondents are full-time faculty members. The respondents represent faculty throughout a range of employment lengths, although recent hires responded in higher percentages.

Although the respondents are demographically similar to the faculty employed, one note of caution should be made about generalizing from this information. Unlike questions about computer use, questions about interest in topics for staff development may not be generalizable to the entire population. Possibly, more faculty who are generally interested in staff development responded to the staff development survey. This possible response bias does not necessarily mean that faculty who did not respond are not interested in the topics listed in the survey, although perhaps traditional "staff development" is not the way to reach these faculty. Nor does this possible response bias affect the trends among faculty respondents -- as indicated by the survey results below, more faculty are interested in some topics than in others and this varies by computer use and by years of employment. However, if 80% of faculty respondents are interested in attending a staff development workshop on a particular topic, it may not follow that 80% of the faculty are interested in such as workshop. A more reasonable generalization is that 80% of faculty who participate in staff development are interested in some particular topic.

Also, *interest in* a topic may or may not translate into faculty *implementing* new technologies in their classrooms. Savvy staff development must inspire faculty to act when plain interest leaves off.

Computer Use: Expertise and Platform

Of the respondents, almost 75% consider their level of computer expertise to be beginner or intermediate. Only 11% claim advanced knowledge. 14% consider themselves non-computer users. Computer users are almost evenly split between Macintosh and IBM-compatible (PC) platforms (about 33% each). Less than 14% claim to be skilled on both platforms. Few faculty respondents are primarily skilled in a mainframe platform.

Some schools have "pockets" of computer users-- both in terms of self-ascribed skill-level and platform used. Business, which almost exclusively uses PCs, has the highest percentage of advanced users of all the schools (33%). (Note: Even this school has more beginner and intermediate users than advanced users.) Sciences & Mathematics also has a relatively high percentage of advanced users (21%) but is evenly split between platforms.

Health & Physical Education and Applied Science & Technology are PC-based, International Education & ESL has more Macintosh users. These three school have neither a large number of non-computer users nor a large number of advanced computer users. Liberal Arts and Behavioral & Social Sciences, primarily Macintosh-based, have the highest percentages of non-computer users.

Schools appear to be associated with trends in platform preference and skill-level, but campuses seem to have little association with either of these. Numbers can be more important than percentage trends, however. Phelan campus, since it is the largest campus, has many more advanced computer users than any other campus. Forty faculty respondents at Phelan claimed to be advanced users, compared to 25 faculty at all the other campuses combined.

Interest in Topics for Staff Development

Overall

Overall, faculty respondents indicate high interest in topics involving technology or implying that classroom and curriculum structure may be changing (see Graphs at the end of this section). These topics are of greater interest than topics such as student discipline, budget and planning, or the role of the Academic Senate, which could be categorized as management or political topics. Respondents indicated interest in each of 42 separate topics.

Variance by Computer Expertise

Faculty interest in technologically-oriented topics does vary with level of computer expertise. This variance does not change the fact that overall interest in these topics is high. It might be best stated that faculty with advanced expertise have *even higher* interest in certain topics. For instance, 86% of advanced computer users express high or moderate interest in "Instructional strategies and innovations (new theories, new technologies)," compared to 70% of non-computer users. Beginner- and intermediate-level users also express strong interest (88% and 89% respectively). This trend is even more pronounced when asked directly about "Computer-based instruction": 88% of advanced computer users, 76% of intermediate, 67% of

beginning and 49% of non-computer users express interest. To have half of non-computer using respondents interested in learning about computer-based instruction is encouraging.

Faculty members with more advanced computer expertise are significantly more likely to express high or moderate interest in the following topics:

- "Instructional strategies and innovations (new theories, new technologies)"
- "Computer-based instruction"
- "Flexible and expandable educational systems to accommodate emerging technologies and academic programs"
- "Word-processing/desktop publishing"
- "The broad implications of evolving technologies and their effects on your work/ classroom/ discipline"
- "Data management system"

Notice that these topics all directly name technology or computers. Not surprisingly, those who have skills in an area also have high interest in it. No significant trends by computer expertise exist for any of the other topics.

A number of topics do not directly name technology or computers but are relevant to our inquiry here for the following reasons: They address changes in curriculum, classroom structure, or faculty skills-building also crucial to this technology plan. The topics listed below were shown to have relatively high levels of broad-based faculty interest. Faculty interest in these topics does not vary by level of computer expertise.

- "Learning styles: adapting classroom techniques to students' various learning styles"
- "Department planning for the next decade: curriculum, hiring, facilities, student profile"
- "Curriculum modifications to address changes in the next decade"
- "Critical/analytical thinking"
- "Our changing student populations: Diversity in background, work-related needs, educational needs, classroom professionalism in the next decade"
- "Realistic expectations for students and for faculty in the next decade"
- "Career changes: Continuing one's professional education to maintain currency"
- "Cooperative strategies in instruction and/or throughout the institution"
- "Integrating writing into course work"
- "Faculty and Staff Resource Center for ongoing support of instructional improvement"
- "Developing interpersonal, time management, organizational, and consensus-building skills"

Faculty generally, it would seem, are less interested in technology for technology's sake than they are in changes to the teaching environment. Thus, highlighting technology's increasing relevance to particular methods of instruction may be the surest way to interest a majority of CCSF faculty in education technology.

Variance by Years of Employment

People often assume that older faculty are less interested in computers, technology, or new teaching methods. Since age was not asked on the survey, years of employment is serving as its proxy. The findings below should be regarded with caution, however, since years of employment may correspond to age but there is no way to verify that for this sample.

Encouragingly, no significant relationship exists between computer expertise and the number of years a faculty member has been employed with the district, when years of employment is broken out into the following categories: new hire-3 years, 4-8 years, 9-14 years, 15-24 years, 25+ years. In other words, faculty across these categories are equally skilled, or unskilled, at computer use.

Interest levels in many staff development topics, such as the role of unions, varies by years of employment. Many of these topics do not pertain to education technology. Of those topics that do pertain (named previously), some but not all vary by years of employment. Those topics listed below vary significantly by years of employment, with faculty members more recently hired showing higher interest. Those topics in bold directly name technology.

- **"Instructional strategies and innovations (new theories, new technologies)"**
- "Learning styles: adapting classroom techniques to students' various learning styles"
- "Curriculum modifications to address changes in the next decade"
- "Our changing student populations: Diversity in background, work-related needs, educational needs, classroom professionalism in the next decade"
- "Realistic expectations for students and for faculty in the next decade"
- **"Flexible and expandable educational systems to accommodate emerging technologies and academic programs"**
- "Career changes: Continuing one's professional education to maintain currency"
- "Cooperative strategies in instruction and/or throughout the institution"
- "Faculty and Staff Resource Center for ongoing support of instructional improvement"
- "Developing interpersonal, time management, organizational, and consensus-building skills"

Interest in the topics below does not vary significantly by years of employment. Again, bold indicates topics that name technology directly.

⇒ "Department planning for the next decade: curriculum, hiring, facilities, student profile"

⇒ "Critical/analytical thinking"

- **"Computer-based instruction"**
- **"Word-processing/desktop publishing"**
- **"The broad implications of evolving technologies and their effects on your work/ classroom/ discipline"**

⇒ "Integrating writing into course work"

- **"Data management system"**

These findings indicate that some topics have a broader appeal than others, which it important whether or not years of employment actually corresponds to age. Those topics which do not vary by years of employment or by computer expertise have the broadest overall appeal with faculty respondents. Those topics, listed above, are preceded by arrows.

The Exception of Distance Learning

Interest in "Distance learning" is lower than interest in any of the other 41 staff development topics presented. Interest does not vary with computer expertise or years of employment -- it is low regardless. No ready conclusions can be drawn from this fact. One explanation might be that faculty believe they are already sufficiently knowledgeable on the subject. The obverse explanation posits that faculty do not yet know enough to be interested. Perhaps that disinterest results from misunderstanding or preconceived notions which could be altered through a "PR campaign" for distance learning. The increasing use of the Internet generally, and its potential application to distance education, may increase faculty interest in this topic.

THE TECHNOLOGY, TEACHING AND SCHOLARSHIP PROJECT SURVEY

The "Technology, Teaching and Scholarship Project Survey" was distributed only to faculty. The extensive survey is five pages of pre-set questions developed by The James Irvine Foundation Center for Scholarly Technology, University of Southern California (USC). An additional page of questions was developed by CCSF. The survey contained more than 70 questions about available computer resources, institutional support, and uses of information technology in instruction and scholarship.

The "Institutional Profile for City College of San Francisco" which USC generated based on the responses of CCSF faculty includes 390 of the overall respondents. (USC excluded respondents who did not respond to key demographic questions.) The respondents are representative of faculty at CCSF according to age and gender. (The ethnic categories could not be compared.) Of the respondents, 54.4% are full-time employees (compared to 44.7% of all

CCSF faculty in Spring 1994). 66.2% of respondents are tenured. 23.3% of the respondents have worked at City College from 23 years or longer (compared to 12.7% at 25+ years). 63.9% credit-only faculty; 21.1% noncredit-only faculty responded.

The respondents represent the schools as follows (overall CCSF percentages in parentheses):

- 8.0% (12.2%) Behavioral & Social Sciences
- 10.0% (10.3%) Health & Physical Education
- 10.6% (8.8%) Applied Science & Technology
- 13.3% (8.4%) Business & Career Development
- 15.6% (18.7%) Liberal Arts
- 17.6% (11.6%) Science & Mathematics
- 18.6% (21.2%) International Education & ESL

Computer Skills and Access

Many of the faculty respondents rate themselves high on technology skills and experience. The most confidence was expressed regarding desktop applications: 59.6% rated themselves high regarding use personal or desktop computers. 18.0% rated themselves high regarding use of instructional software in their classes. Only 10.3% considered themselves to be competent at computer programming.

Most respondents have computer access; only 15.6% don't have a computer either at home or in their office. 14.6% of respondents have a computer only in the office, 43.6% have a computer in their home only, and 30.8% have a computer both at home and at the office (15 of 120 are a single, portable computers). 54.0% occasionally use computers in a common facility. Of those faculty who do not have home or office computer access, less than half state a computer is not necessary for their work. 49.6% stated that their office computer was purchased prior to September 1990. IBM-compatible and Macintosh computers are used about equally.

Classroom and Professional Use of Technology

The USC survey asked questions about current teaching strategies and curriculum development. During the past three years, 35.3% of the respondents team-taught a course with a department colleague. 6.1% team-taught with someone from another department. 33.8% developed a new course not previously taught at CCSF. Faculty respondents indicate that information technology has been a "major benefit" to their teaching. 42.5% cite increased enjoyment in teaching and 38.9% cite creativity in presenting material to students as major benefits. Overall quality of teaching, access to new resources for teaching, and student response to course content were also cited..

Faculty respondents indicated instructional resources they are currently using for "first course you teach each week this term" and the resources they would like to use for that course. The resources they would like to use, which might be considered new areas of interest, are in parentheses. For example 15% currently use computer lab assignment and an additional 15% are interested in using computer lab assignments.

- 19.8% (16.8%) computer software
- 15.0% (15.2%) computer lab assignments
- 6.7% (15.0%) computer simulations or courseware
- 1.0% (11.0%) e-mail to students
- 27.3% (6.4%) study teams
- 38.5% (12.0%) video
- 28.3% (4.3%) audio
- 1.3% (13.4%) materials I found via the Internet
- 6.2% (15.5%) multimedia presentations
- 2.2% (17.1%) CD ROMs
- 7.7% (19.0%) self-paced instructional software.

Faculty respondents indicated the importance information technology resources to various aspects of their professional work. 75.6% stated word processing was important or very important. 56.5% stated that information technology is important or very important for preparing presentations for their classes.

Institutional and Departmental Technology Priorities

Faculty respondents have observed changes that are already taking place to due increasing use of information technology. 94.8% believe faculty colleagues work at home more because they have a home computer. Since the beginning of the term, 62.5% of faculty discussed uses of technology for instruction and 60.9% discussed departmental technology resources with department colleagues.

Faculty respondents are <u>not</u> convinced that CCSF has a good strategic plan for the use of information technology. 71.4% believe expanding the college network should be a to priority for CCSF. Some other major problem areas faculty cite include hardware (67.9%) and software (65.9%) purchases/upgrades, access to CD-ROMs and multimedia (55.4%), incentives and rewards for innovation (46.4%). Only 18.2% of faculty respondents believe CCSF currently rewards innovative teaching.

More than half the respondents believe that CCSF needs to offer more computer workshops, although the vast majority are satisfied with the level of courses that are currently offered. Faculty respondents were most interested in learning more about word processing or internet information retrieval with an initial focus on course development.

The Future of Education

Only 13.5% of faculty respondents believe by the year 2000, that a community college instructor will simply and only be a lecturer. 55.5% believe the way they teach their classes will change within this decade. 13.0% say their students currently need a computer for homework, research and exams. By 2000, 36.5% believe their students will need a computer for all of these.

PROFESSIONAL DEVELOPMENT NEEDS ASSESSMENT SURVEY RESULTS

MEAN	ALL TOPICS
1.687	Instructional strategies and innovations (new theories, new technologies)
1.887	Learning styles: adapting classroom techniques to students' various learning styles
1.934	Departmental planning for the next decade: curriculum, hiring, facilities, student profile
1.938	Curriculum modifications to address changes in the next decade
1.989	Critical/analytical thinking
1.994	Our changing student populations: Diversity in background, work-related needs, educational needs, classroom professionalism in the next decade
2.025	Realistic expectations for students and for faculty in the next decade
2.049	Computer-based instruction
2.049	Flexible and expandable educational systems to accommodate emerging technologies and academic programs
2.077	Wordprocessing/ desktop publishing
2.079	The broad implications of evolving technologies and their effects on your work/ classroom/ discipline
2.092	How to provide a more user friendly environment for students
2.124	Career changes: Continuing one's professional education to maintain currency
2.129	Safety and emergency procedures (CPR, first aid, disaster preparedness)
2.165	Cooperative strategies in instruction and/or throughout the institution
2.195	The impact of multicultural dimensions on your course work
2.210	Stress management and other health-related issues
2.232	Integrating writing into course work
2.251	Issues of academic freedom and academic responsibility in the next decade
2.252	Faculty and Staff Resource Center for ongoing support of instructional improvement
2.287	Developing interpersonal, time management, organizational, and consensus-building skills
2.295	Coping with challenging situations such as student discipline, the disruptive student
2.308	Classroom assessment and re-thinking test design
2.310	Budget and planning
2.363	Public relations: Improving contact with the public
2.366	Showcasing/advertising City College to the community
2.387	The changing political policies that affect our College employment and your classroom
2.392	General assessment for placement of students
2.392	The impact of international dimensions on your course work
2.420	The community college mission: A forecast for the next decade
2.427	Efficient use and maintenance of present facilities and acquisition of new buildings
2.480	Student transfer, including getting to know other institutions, where our students go, what our articulation agreements are
2.492	Master Plan
2.495	The role of unions
2.548	Shared governance
2.584	Understanding the Americans with Disabilities Act and your professional rights and responsibilities
2.588	The role of the Academic Senate
2.630	Business writing, editing, proofreading
2.676	Data management system
2.683	Program Review
2.742	Understanding the District's Sexual Harrassment [sic] Policy and your professional rights and responsibilities
2.840	Understanding sexual orientation as one of the elements of diversity
2.842	Distance learning

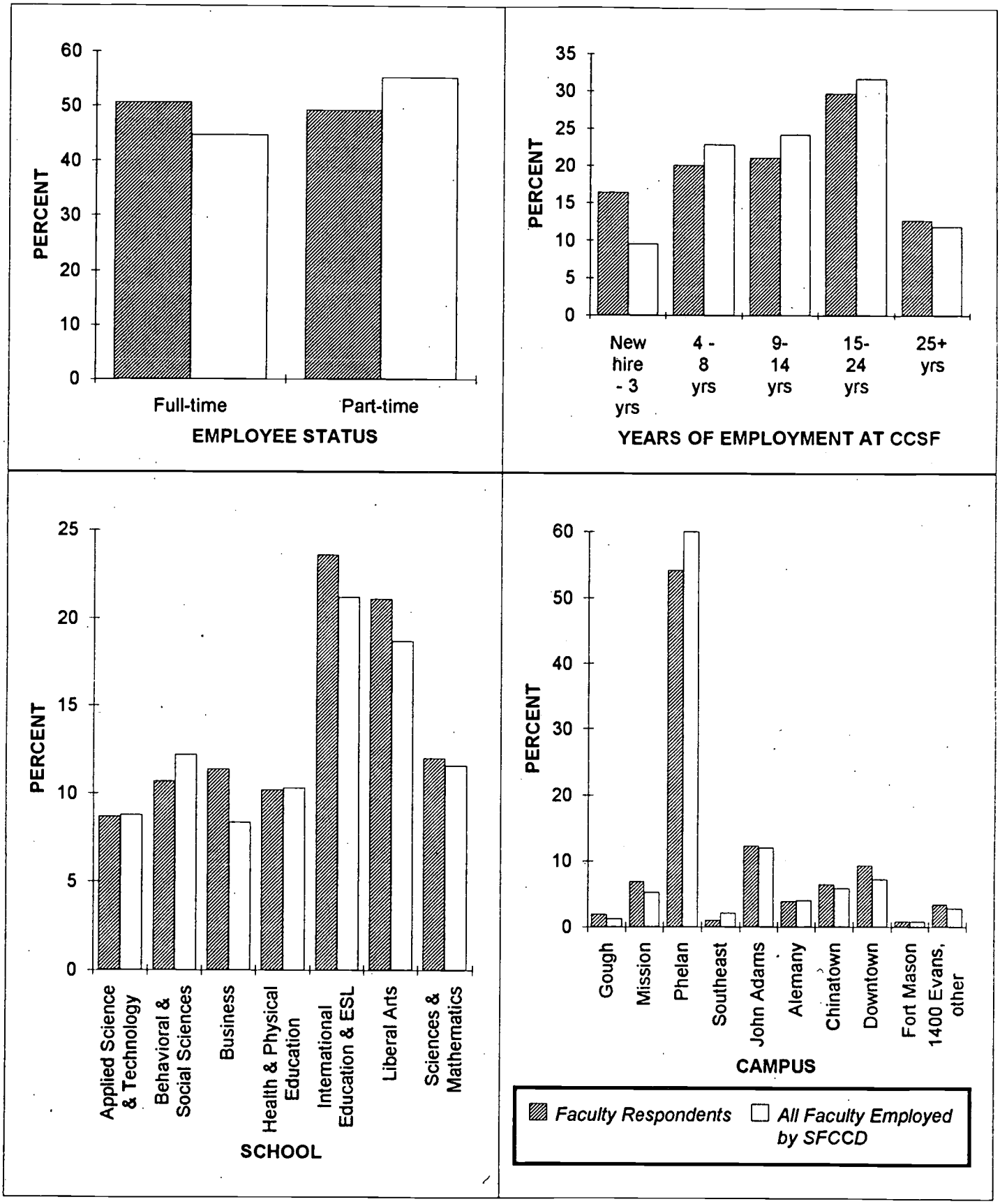
KEY: Shaded areas are selected topics impying the use of technology and/or changing classrooms, curriculum.
NOTE: Mean is based on scale of 1 to 4, 1=high interest. The lower the mean the higher the collective interest level.

PROFESSIONAL DEVELOPMENT NEEDS ASSESSMENT SURVEY RESULTS:
Selected Topics Implying the Use of Technology and/or Changing Classrooms, Curriculum

MEAN	SELECTED TOPICS
1.687	Instructional strategies and innovations (new theories, new technologies)
1.887	Learning styles: adapting classroom techniques to students' various learning styles
1.934	Departmental planning for the next decade: curriculum, hiring, facilities, student profile
1.938	Curriculum modifications to address changes in the next decade
1.989	Critical/analytical thinking
1.994	Our changing student populations: Diversity in background, work-related needs, educational needs, classroom professionalism in the next decade
2.025	Realistic expectations for students and for faculty in the next decade
2.049	Computer-based instruction
2.049	Flexible and expandable educational systems to accommodate emerging technologies and academic programs
2.077	Wordprocessing/ desktop publishing
2.079	The broad implications of evolving technologies and their effects on your work/ classroom/ discipline
2.124	Career changes: Continuing one's professional education to maintain currency
2.165	Cooperative strategies in instruction and/or throughout the institution
2.232	Integrating writing into course work
2.252	Faculty and Staff Resource Center for ongoing support of instructional improvement
2.287	Developing interpersonal, time management, organizational, and consensus-building skills
2.676	Data management system
2.842	Distance learning

KEY: Shaded areas are significant by computer skill-level.
NOTE: Mean is based on scale of 1 to 4, 1=high interest. The lower the mean the higher the collective interest level.

FACULTY RESPONDENTS COMPARABLE TO ALL FACULTY



n=656 Faculty Respondents
n=1657 All Faculty Employed by SFCCD

APPENDIX 5

Student Assistants

Date: Mon, 13 Nov 95 08:30:33 +0000
From: Steven W. Gilbert <gilbert@clark.net>
To: American Association for Higher Education <aahesgit@list.cren.net>
Subject: AAHESGIT: Student Solution to Support Svc. Crisis?

(Approx 3 1/2 pages from Phil Long of William Paterson College of NJ, <LONG_P@wpc.wilpaterson.edu> about a program for funding and using students to supplement info tech support services. This is an excellent example of a program that is encouraging, supporting, and using students to combat the increasingly common "support service crisis".

[NOTE: This paper was prepared in preparation for a brief presentation at the SECOND ANNUAL AAHE TEACHING, LEARNING, AND TECHNOLOGY ROUNDTABLE (TLTR) PROGRAM PLANNING MEETING. As of Saturday, November 11, 1995, the TLTR was one year old!]

The "Support Service Crisis" results from the increasing gap between the supply of and demand for support services related to using info tech to improve teaching and learning. More colleges and universities are managing to find (usually one-time or unpredictable) funding for major hardware investments that may include some software, but almost never include additional support staff. Software publishers are making available attractive new products, updates and upgrades faster and faster. Viruses continue to appear and campus users of technology need help in coping with them. As more students and faculty discover EMail, some invisible "critical mass" of number of active local message senders is passed and the volume of network usage increases suddenly -- more than anyone anticipated.

More faculty decide that they really can/should use some application of info tech to improve their teaching and their students' learning, and ask for help that includes -- and goes beyond -- the technical issues: they need help from people who understand and can guide pedagogical change, and from librarians who can help locate and evaluate relevant materials on the Internet. Adding professional staff to extend the availability of all these kinds of faculty/student support services is expensive and in conflict with efforts to stabilize or reduce operating expenses at many colleges and universities.

Finding responsible ways in which to use students for these purposes is the only hopeful development I've seen for increasing support services while controlling costs. What has already begun at William Paterson College is a pattern that the AAHE TLTR Program will be encouraging. We will try to help other institutions develop similar approaches and extend these ideas even further as Faculty/Student Support Service Teams (FSSSTs).

As Phil Long says: "Win-win situations in technology support services are hard to find, but the STC Program at WPC seems to be one of them." The students, faculty, and staff get more and better support services than would otherwise be available. The participating student "consultants" get some pay, perhaps some academic credit, and training and experience that will be valuable preparation for many future careers.

Thanks for this encouraging report, Phil.)

Steve Gilbert

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The Student Technology Consulting (STC) Program
- Students Guiding Students Using Technology

Phil Long
William Paterson College of New Jersey
November 10, 1995

BACKGROUND

We're all drowning in the support demands that accompany technology implementation projects on our campuses. While many of us have had varying degrees of success getting funds for hardware, getting funds for support staff seems to have been more difficult. At William Paterson College (WPC) we have joined the growing river of campuses that have successfully argued for and implemented a Student Technology Access Fee (STAF - $50 per student per semester, pro-rated for part-time students). One of the key projects supported by the STAF at WPC is the formation of a paid student consulting core, including a full time staff member, a Student Technology Consulting Program Coordinator, to train and manage the students hired in the program. 68% of the funds derived from the STAF goes to salaries supporting this program.

STUDENT TECHNOLOGY CONSULTING (STC) PROGRAM

The Student Technology Consulting Program puts students in the public access computing labs (one consultant per 20 machines) to help other students, faculty, and anyone else who needs it. Student Technology Consultants (STCs) receive a minimum of 16 hours of training in the hardware and software for which they are providing help, professional consulting and listening skills, and using library information access tools (OPAC, CD-ROM catalogs, etc.). Students are paid between $6 and $8 per hour, in roles of general consultant, consultant supervisor, and consultant trainer. The job is not guaranteed to continue from one semester to the next. Reappointment is based upon the student's performance as an STC. Students who demonstrate active interest in the program get special assignments, promotions, and more work hours. Evaluation of each student's performance is jointly determined in a review meeting of the STC Supervisors and the STC Coordinator, based on criteria identified for that student. The program coordinator actively seeks out the personal and career interests of the workers and tries to design programs to encourage those most in need of encouragement, and reward those most deserving of reward.

STC TRAINING CURRICULUM -- OVERVIEW

Training is provided by the STC Coordinator, the Director of Instruction and Research Technology (IRT), Reference Librarians, and, in the future, STCs who have shown the skills required to effectively teach their peers. Training has been scheduled on Saturday mornings and afternoons. The students' performance in the training is evaluated by observation of their participation and progress and by the quality of their work on written project assignments included in sessions two, three, and four. Note that assignments vary from presentation to presentation based upon the topics emphasized by the instructor, and that students must at least complete the first three hour training session before beginning work as an STC.

STC TRAINING CURRICULUM -- SESSION ONE

Introduction, Role of the STC

- Description of the program
- What the job is about and what our expectations are for STCs
- Elements of professionality (what behaviors are and are not acceptable as an STC)
- Role playing of possible client-STC interactions with an emphasis on conflict resolution
- Physical and virtual tour of the campus

STC TRAINING CURRICULUM -- SESSION TWO

The Internet and the cyberworlds available at William Paterson College

- Outline of the history and possibilities of the Internet
- Virtual tour of Internet resources on and off campus
- Training in "makeacct" the self e-mail account creation procedure
- Basic Internet utilities - FTP, Telnet
- Intro to the campus mail system - the Pine Mailer
- Intro to web browsers and Netscape Assignments: find and print a personal copy of the Netscape handbook to have ready on demand; find five to ten academic
- Internet sites and demonstrate their importance or relevance to William Paterson College

STC TRAINING CURRICULUM -- SESSION THREE

Library related applications and the STC support tasks for workers stationed in the Electronic Learning Resources Center, jointly administered by the Sarah Byrd Askew Library and Instruction and Research Technology (IRT) staff at WPC

- WPC Library applications (IAC, the OPAC, local CD-ROM databases)
- "Learn to listen", encouraging the development of listening skills and patience among the STCs Assignments: Find references to works published by WPC faculty in the OPAC; use an appropriate database index to locate information about teaching and technology; using a CD-ROM database identify three health hazards associated with computer use

STC TRAINING CURRICULUM -- SESSION FOUR

Advance topics in common Toolkit software applications, productivity software supported on the campus network and delivered to the public labs.

- Word processors - WordPerfect, Word
- Spreadsheets - Quattro Pro for Windows, Excel
- Graphics - Harvard Graphics, Cricket Graph
- Databases - Paradox for Windows, dBase for Windows, Filemaker Pro
- Presentation Tools - PowerPoint, Persuasion

Assignments: Outline the five most likely questions you think students will ask about using a word processor; create a simple spreadsheet tracking supplies used monthly in the labs over the course of the year; graph the expenditures outlined in three ways; explain how a database might be used for tracking user help requests; create a brief (five slide) presentation on a topic that you think would make a good workshop for your fellow students.

THE FUTURE FOR STC AT WPC

The potential for this program continues to grow. All the students in the program are given projects to challenge and further develop their information access skills. Selected students from this program are now offering courses to students and faculty on "HTML Authoring" and "Using the Campus E-mail System Effectively." Other students are designing software for the program, putting together a workshop on health and safety aspects of workstation ergonomics, and designing graphics for the program.

At the present time we are only working with undergraduate students, but this might expand to graduate students in the future. Our experience with older returning students is limited (one individual), but so far he has proven to be an asset to the program - one of the eight people promoted to a supervisory position. The program does not currently offer academic credit for the work. We plan to work with the academic units on campus to develop this as an option for those students for whom credit would be a stimulus to participate in the program. We have not had the program long enough to be concerned about training students who then leave for higher paying off-campus jobs. Our pay scale is better than most existing campus part-time positions which makes us an attractive place to work at the outset. If the training and skill that are taught in the STC program can be a stepping stone to something better elsewhere, we will have done our job.

We see the use of STCs as a bright opportunity to provide needed help to students, training, and, as has been mentioned on the AAHESGIT list, multimedia development support for faculty. Win-win situations in technology support services are hard to find, but the STC Program at WPC seems to be one of them. Students see a direct return on their Student Tech Fee investment in help and jobs. Gee it's nice to see something really working in this business!

Phillip D. Long, Ph.D., Director, Instruction and Research Technology,
William Paterson College of New Jersey.
Co-chair, Teaching Learning Technology Roundtable.

APPENDIX 6

Video Production, Transmission and Distance Learning

This appendix was extracted from the 10/27/95 draft of Education and the New Technology. It was written some time in the past two years. It does not take into account the relatively recent emergence of the Internet as a way to provide distance education. For some examples of Internet uses in particular, refer back to Appendix 7, Implications and Examples. Quality teleclasses, another venue for distance learning, require specially designed classroom facilities. Provisions for teleclasses at all campuses should be explored and implemented when feasible and beneficial.

Distance learning has been defined as *...instruction in which the student and instructor are separated by distance and interact through the assistance of computer and communications technology. Distance learning may also include video or audio instruction in which the primary mode of communication between student and instructor is through a communications medium such as instructional television, video, or telecourses, and any other instruction that relies on computer or communications technology to reach students at distant locations." (CPEC, 1991)*

Distance learning can be further divided according to the method of distribution and content of the transmissions, as described below. Video signals are distributed to distance learners in one of two ways:

- compressed video, where the signals are sent via telephone line or fiber-optic cable. The compression process makes motion appear jerky and abnormal, but reduces the amount of 'bandwidth' required to transmit the signal
- regular video, where the signal is sent directly to the distance learning location via broadcast station, cable system or microwave. The 'real-time' transmission of the signal results in motion appearing more natural than that provided by compressed video.

Distribution methods for video signals are classified into three subgroups:

- One-way video describes situations where a video signal is sent from the origination site to the distance learner. An example of this distribution method is a regular television broadcast. This distribution method does not permit interaction between student and instructor.
- One-way video with two-way audio describes situations where the one-way video portion of the transmission is supplemented by a telephone or radio to permit two-way voice transmissions between student and teacher.
- Two-way audio and video describes situations where a combined audio-video signal is sent from the transmission site and a return combined audio-video signal is returned. This method, which is the most costly of the three, allows students and instructors to both hear and see each other during the transmission.

The content of courses presented via distance learning can be classified into two broad categories:

- Teleclasses are regularly scheduled class sessions which are transmitted to distance learners from a classroom equipped with cameras, monitors, and speakers. Students may be present in the classroom where the class is actually presented 'live,' while distance learners may view it in real-time (i.e., 'live'). Teleclasses are also frequently videotaped for subsequent distribution.
- Telecourses are pre-packaged video tapes (often with accompanying workbooks, study guides and ancillary material) containing a course of study. Since these courses are pre-recorded, there is no opportunity for student-teacher interaction.

Video technology also connects distant sites via satellite links. Satellite uplink describes the method of transmitting a video signal from an origination site (such as a classroom equipped for teleclasses) to an orbiting satellite. Satellite downlink describes the method of 'capturing' a video signal originating from a satellite uplink. An antenna (i.e., 'satellite dish') is used to 'acquire' the video signal from the satellite. These connections permit interaction via teleconferencing.

Distance education can eliminate traditional constraints of time and place, thus enabling greater access to a wider range of subjects. Application of this technology is therefore consistent with and can provide an effective and cost-justified means to meet a wide range of needs for a large number of students:

- directives established for California's educational institutions regarding equity of access to high quality instruction in a full range of subject areas (CPEC, 1989)
- expansion of adult education classes to address unmet needs for English as a Second Language instruction, as well as curriculum enhancement to meet the needs of high-risk students likely to drop out of traditional classroom programs (AB 918)
- provision of instruction to adults in all regions of the state (AB 2033)
- achievement of many goals and objectives of the CCSF Master Plan. These include:
- meeting student needs for increased class availability and support services
- offering new programs without significant increases in staff
- expanding linkages between remedial and ESL course and other educational programs
- improving college facilities, equipment and uses of technology
- increasing availability of technology for disabled students
- developing strategies to increase public funding from federal, state and local sources
- providing quality staff development programs which prepare staff for the educational needs of the 21st century.

- reducing need for additional classroom space normally associated with rising enrollment levels
- saving on travel time for both student and faculty
- consolidating low-enrollment, specialized, classes normally held on several campuses into a single course

Technological advances continue to increase the amount of digitized information that can be carried in compressed signals, and it is expected that this will result in improved quality of video transmissions. These advances should result in lower costs and increasingly affordable two-way interactive systems for use in the home. Some companies, such as Pacific Bell, are marketing desktop conferencing systems which use small cameras and microphones attached to the computer screen (i.e., monitor) to enable two-way audio and video communications. These developments are expected to accelerate the demand for video-based distance education, and with it, the number of suppliers of these 'products' to students.

Many community colleges operate cable television stations, and colleges (both two- and four-year) offer complete certificate and degree programs through video-based distance learning. The California State University system, for example, has a network of two-way audio and video classrooms on each of its twenty campuses. These classrooms are used to offer the same course simultaneously at two or more campuses around the state, as well as for system-wide administrative meetings, thus reducing travel costs and travel time.

CCSF currently offers ten telecourses per semester with a combined enrollment of between 500 and 550 students. These courses are distributed via the San Francisco Educational Cable Access Channel (Channel 52), which is operated by City College. This medium reaches about 160,000 San Francisco households which receive cable television service via Viacom. The broadcast signal for Channel 52 does not reach beyond the San Francisco city/county boundaries.

We do not currently deliver telecourses to central classroom sites. Students must therefore either watch or videotape the lessons from home. Copies of the telecourses are archived in the Phelan Campus' Media Center. At present all of our telecourse offerings are via one-way video which, as described above, does not permit interactivity between students and teachers. Although teleclasses have been approved by the Curriculum, none are offered by CCSF at the present time. All campuses except Downtown, Southeast and Evans current have cable access.

The College's facilities and equipment for video transmission and delivery include:

- cable FM radio station (Broadcast Communications Department)
- satellite downlink (Broadcast Media Services)
- cable television channel (Channel 52)
- closed-circuit cable television system (full motion video, 30-channel capacity)
- one-video/two-way audio (Broadcast Media Services)

- ten classroom video viewing units (seven in Broadcast Media Services, three in Audio Visual)
- three viewing rooms (Audio Visual)
- fifty classroom video viewing sites (Broadcast Media Services)
- multi-purpose room appropriate for teleconferences (Broadcast Media Services)

Faculty requests for services from Broadcast Media Services has increased dramatically over the past four years. Services are provided primarily on the Phelan Campus. Microwave links across the campuses, along with improved Channel 52 broadcast capability, would transform City College into a distributed classroom environment giving students on campus and those at home full interconnectivity. Faculty would be able to originate a teleclass at any of the campuses, and students could elect to 'take' (i.e., receive) it at a time and location convenient to their schedule. Students could therefore complete entire certificate and/or degree program with only an occasional visit to a CCSF campus.

Goals and Objectives for Video Transmission include:

- Accommodate student schedules and relieve enrollment pressures on impacted departments by expanded offerings of teleclasses with two-way audio capability distributed to students at various campuses and at home.
- Equip a classroom on the Phelan campus near the Broadcast Media Support Services facility with remote control cameras, microphones, lights, telephones, facsimile machines and FM radio feeds
- Train student lab aides how to use classroom cameras, microphones and related equipment
- Connect the Phelan, Downtown, Southeast and Evans campuses via microwave link
- Wire at least one room at each of these campuses so it can receive broadcasts from each of the other campuses
- Determine how these facilities can also be used for staff development and administrative purposes
- Coordinate teleclasses and telecourse offerings into programs leading to transfer and/or AA/AS degrees
- Pilot one or two telecourses and or teleclasses before committing to interactive videoconferencing
- Introduce non-credit teleclasses in ESL and basic skills
- Establish a satellite uplink to distribute CCSF course offerings, instructional teleproductions, and staff training programs to any point in the District and beyond.
- Optimally coordinate Audio Visual, Broadcast Media Services and the Media Center.

Implications and Examples

This section presents a few of the ways that education technology can be used for Teaching & Learning. We recognize that education technology is changing even as this plan is being written, so an important part of the Staff Development Program will be to inform faculty of new ways to use education technology, and new forms of technology available.

MULTIMEDIA ON CD-ROM DISKS

One of the most common uses of multimedia technology in education is using pre-packaged CD-ROM disks as supplements to traditional textbooks, and as substitutes for rote learning tasks. For example, multimedia programs for English language acquisition allow a student to highlight unfamiliar words in a text passage displayed on the monitor. A prerecorded native English speaker pronounces the words highlighted on the monitor. In some applications the student can then use a microphone attached to the workstation to record their pronunciation of the words, and then compare their pronunciation with that of the native English speaker whose voice is recorded on the CD-ROM.

NETWORKS AND THE INTERNET

Interactive Education: Networks and the Internet can create forums for an active and participative learning experience. Faculty and students can:

- conduct group discussions and/or individual conferences
- broadcast, complete, grade and return class assignments
- comment on each other's work
- respond to discussion questions
- exchange ideas and information

These interactions can take place either in real time where all participants are connected to the network at the same time (i.e. synchronous) or on a delayed basis via e-mail or bulletin board services (i.e. asynchronous).

Research: A vast—and growing—number of information resources are available via the Internet. A user can access these electronic repositories of information (such as library card catalogs, government information data bases, and electronic versions of publications such as newspapers and magazines) from a workstation connected to the Internet. This permits a researcher to access data without having to leave their workplace and increases the amount of information which can be used for a research project.

Distance Collaboration: One of the first uses of what is now called the Internet was exchange of research results and other scholarly information via computer network. These exchanges speed up the research process and allow persons at remote sites to exchange ideas with others located far away. These forms of collaboration are not restricted to academic research; administrators and students can also collaborate with colleagues at other sites via the Internet.

Flexible Scheduling: Data communications network services such as e-mail and bulletin boards permit flexible class formats. Instead of meeting for the traditional three times per week format, courses could be comprised of periodic teacher-to-student interactions via the network with only occasional group meetings. This format has potential for greater attention to individual student needs as it combines personalized education with the broad access of our mass education system. These arrangements may also increase student accountability as class members and faculty can monitor participation in collaborative assignments.

VI. GLOSSARY

CD-ROM disk (compact disk-read only memory):
Holds more data than standard floppy diskettes and is therefore a better storage medium for complex multimedia programs and large collections of information such as encyclopedias and other reference materials.

Client:
1) In a network, a computer that requests services or data from other computers known as servers. Also known as a workstation. 2) As software, a program that makes requests to and presents data from another program that acts as an information server.

Computer-Based Tutorial (CBT):
An application that leads a user through a series of graduated exercises. Often diagnoses user's skill-level, prescribes exercise(s) appropriate to skill-level, then analyzes the exercise results.

CPU (Central Processing Unit or "chip"):
The most fundamental piece of computer hardware; the computer's "brain".

Dynix:
A popular OPAC (Online Public Access Catalog) system, which the CCSF library utilizes.

Education technology:
Information technology used for educational purposes.

Electronic mail (e-mail):
Mail that is transferred electronically.

GUI (Graphical User Interface):
The capacity to represent information graphically, as well as in "text-only" format.

Hardware:
The physical equipment of a computer.

Homepage (or Web Page):
A virtual site on the Internet, usually referring specifically to a site accessible through the World Wide Web. Contains basic information about an individual, institution or product. Created using hypertext language.

Hypertext:
Enables rapid access to various pieces of information stored separately from the main document, but cross-referenced.

Information technology:
Any or all of a number of digitally-based technologies ranging from fax machines to computers.

Instructional designer:
A technical expert who develops or assists in developing "courseware" and multimedia products for educational use.

Internet:
A world-wide network of computer networks. A "router" connects the network to the Internet. Many resources and means for sharing information are available through the Internet, including e-mail, data repositories, bulletin board services and user groups for sharing information.

ISP (Internet Service Providers):
Third-party providers of Internet services.

ITS (Information Technology Services):
An administrative department at CCSF providing hardware and programming support to the college's administrative, faculty and student users.

ITUG (Intech usersgroup):
Faculty-based group formed to support "Innovations in Information Technology for Teaching & Learning."

IUG (Internet usersgroup):
A group of faculty and staff interested in the use of the Internet for instructional and educational purposes.

Lan administrator:
A member of the technical staff responsible for the functioning of a single or small number of local area networks.

Laptop computer (or laptop):
A portable, personal computer.

LCD:
A device which allows output to a computer monitor to be displayed on a large screen for group viewing.

MIS (Management Information Services):
A standard phrase usually referring to a data management and/or reporting system. The State Chancellor's Office for the California Community Colleges requires all its colleges each semester to submit tapes with student, course, and student services data.

Modem:
A device which allows "dial-up" access to a single computer or computer network.

Multimedia (also Multi media, Multi-media or Multiple media):
A single collection of both audio and video in one storage medium, usually a CD-ROM disk. Can include graphics such as still photographs as well as video clips, in addition to basic text.

Network (Computer Network):
An interconnection of workstations and servers with physical links (e.g., hard-wired together or to a hub) and logical links (i.e. use the same protocols to communicate). May be referred to as a LAN (Local Area Network) or WAN (Wide Area Network).

Network administrator:
A member of the technical staff responsible for oversight of all aspects relating to the interconnection of computer systems throughout the enterprise and to the larger Internet, including, but not limited to 1) coordination the LAN administrators, 2) the planning, design, and implementation of network architecture to acheive enterprise goals, 3) the management of installation, configuration, and maintenance of network equipment, such as routers, switches and hubs.

OMR (Optical Mark Reader):
Used to process "bubble" forms such as those produced by Scantron Corporation.

On-line:
A phrase which refers to being "on" (also "logged onto"). Frequently used in reference to the Internet or the World Wide Web.

PPP (Point-Point Protocol):
Standardized internet protocol for modems. Supersedes SLIP.

Scanner:
A machine that "reads" text and/or graphics from a printed page into a computer file.

Server:
1) A computer which services requests from client machines in a computer network 2) A program that services requests from client programs, e.g. Web server, Oracle server.

SLIP (Serial Line Internet Protocol):
Software that makes it possible to use the same Internet facilities over a phone ("dialup") connection that are available over a direct network connection. Superseded by PPP.

Smart classroom (or computer classroom):
A classroom which contains multiple, networked computers for students use and a large screen display. This classroom may or may not be wired for Internet connectivity.

Software:
The programs, such as word processing, database, spreadsheet, that "run" on computer hardware.

System administrator:
A member of the technical staff responsible for various duties on a computer system with multiple concurrent users, including by not limited to: 1) addition and removal of user accounts, 2) addition and removal of hardware on the machine, 3) scheduling and execution of file system backups, 4) the installation of new software, patches, and software upgrades, 5) analysis of problems occurring within the system, 6) maintenance of system documentation.

Technical support:
Any of various services provided to computer users, from installing a computer to helping produce "courseware."

User:
A computer user.

Web administrator:
A technical support person responsible for maintaining World Wide Web access and supporting the creation of homepages. (See homepage.)

Wired classroom:
A classroom which contains an Internet connection.

Workstation:
Roughly equivalent to "personal computer," the basic building block of an integrated campus technology system. Either in a fixed location or portable; connected to a network or used as a standalone machine. Most simple form includes a central processing unit (see CPU), a hard disk (central memory repository), keyboard, monitor ("screen"), floppy drive(s). Permits entry of text and/or data by keystroke or transfer from a floppy diskette. Software can be used to manipulate and format the presentation of this text/data, displayed on the monitor, printed in "hardcopy" format, stored on the hard drive or on a floppy diskette. Software ranges from basic word processing to complex scientific simulations. Depends on the capacity of the machine (e.g., speed of the chip) and the software.

World Wide Web (WWW or the Web):
A world-wide network which provides graphics as well as the text provided by the text-only lynx. See GUI.

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