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ABSTRACT

This document reports on the history of the California Community Colleges High Tech Centers for the Disabled between the years 1983-1992. Monterey Peninsula College (MPC) asked, in 1983, what role computers play in the lives of students with disabilities. This question set in motion a chain of events that resulted in creation of the program, which is the largest and most sophisticated of assistive computer technology services in the United States. In the spring of 1984, MPC's first course in word processing for students with disabilities had 6 students. The course had to address questions such as, How could a student typing with only one finger hold down two keys at once? Solutions to access problems were addressed through trial and error. Word of the program circulated across the state, and a model plan was developed that would create High Tech Center programs based on a standardized package of assistive computer hardware and software proven through use at MPC. Community colleges wishing to participate in the program provided a 25% cash match against the cost of implementing a facility on their campus. High Tech Center programs are now in place at 80 California community colleges. The computer access model has been adopted by many California State University and University of California campuses as well. (Author/NB)

The California Community Colleges High Tech Centers for the Disabled - A Historical Prospective

In early 1983, the DSP&S program at Monterey Peninsula College, like programs at many other California community colleges, found itself struggling with the complex issues of computer usage in post-secondary education. In addition to matters of academic viability, cost effectiveness, technical support, and instructional content, a more immediate question was at hand: what role would computers play in the lives of students with disabilities. Although we were unaware of it at the time, this question would set in motion a chain of events resulting in creation of the largest and most sophisticated program of assistive computer technology services in the United States, the California Community Colleges High Tech Centers for the Disabled.

In the Spring of 1984, Carl Brown and Marcia Norris offered the college's first courses in word processing for students with disabilities. Six students enrolled. The difficulty of using microcomputers, even by students with relatively mild orthopedic disabilities, was obvious. How, for example, could a student typing with only one finger hold down two keys at once? How could a student with low vision see what was appearing on the computer screen?

Through trial and error, partially effective solutions were developed for some of the more acute access difficulties. Feeling confident that we had solved the problem of providing computer access for disabled students on campus, we resumed the word processing course. The following semester, fourteen disabled students enrolled in the course. Pleased with the acceptance of this new program by disabled students on campus, we solved a few more computer access needs and got on with the business of teaching word processing. In the summer, over thirty disabled students requested enrollment. Much to our amazement, disabled individuals who had never considered post secondary education were enrolling at Monterey Peninsula College in order to learn word processing with adapted computers. And they were staying on to become successful participants in mainstream courses.

Demand for the course quickly outreached our ability to provide services. Obviously, it was time to stop and think carefully about what was happening and what we were

doing. That we had discovered a tremendous unmet need was obvious, but what was it?

Upon closer examination, it became apparent that what students were coming for was not so much word processing as an opportunity to learn how to use assistive devices which gave them better access to computers in general. We had tapped the great desire felt by many disabled individuals to use computers. Much to our surprise, we discovered that we were not in the word processing business, but rather in the business of providing computer access to students with disabilities.

After careful consideration, we determined that a real need existed for a systematic program of identification, testing and implementation of assistive computer technology at Monterey Peninsula College. Rather than building a new program by acquiring existing "old style" assistive devices, we decided to determine what an ideal assistive computer device ought to do and then set out to find or create it.
In reviewing the advanced state of microcomputer technology and its wealth of new and emerging software, we felt the time was right for a radical change in the traditional approaches to providing computer access to persons with disabilities. As our primary goal, we established the replacement of expensive hardware-based computer modifications (special keyboards, large-screen display monitors, etc.) with high-quality, software-based adaptations. These adaptations had to be easy to use and commercially available. Given the sophistication and unexplored potential of microcomputer and software technology available in 1984, we felt that these adaptations ought to be significantly less expensive than traditional access systems.

With the demonstrated computer access needs of our students in mind, we formulated a set of criteria for evaluating possible assistive computer technologies.

Every adaptation employed by the High Tech Center would be required to:

• Function, where ever possible, entirely as software.

• Provide the disabled individual with significantly improved access to microcomputers.

•Function with industry standard software such as Lotus, WordPerfect, and dBASE.

• Share computer memory harmoniously with many other adaptations. Student needs frequently required the simultaneous use of several adaptations for effective computer access.

• Be easy to teach, learn and maintain. With rare exception, the individual should have a basic grasp of program operation in less than thirty minutes.

• Be affordable -- generally, less than three hundred dollars.

• Function with MS-DOS or Macintosh computers. (Although a particular adaptation might not necessarily be interchangeable between PC and Macintosh computers.)

There were a number of deeply held philosophical positions underlying our commitment for access to commercially available software.

We saw the High Tech Center as a training facility rather than a "separate but equal" computer facility for students with disabilities. Our expectation was that disabled students would come to the High Tech Center to learn the use of assistive computer technologies appropriate to their disability. When a functional level of competency had been attained, the students would transition to mainstream courses where, if computers were used, assistive computer technology would be available at the various computer facilities on campus.

We felt that transitioning students into a wide range of courses which used computers (i.e. accounting, drafting, graphics, word processing and computer science) would tend to break down a long standing equation concerning computers and the disabled: Disabled Person + Computer = Computer Programmer. We felt that access to assistive computer technology would provide many other career opportunities in addition to computer programming.

Our decision to seek or develop assistive computer technologies which could function together harmoniously was a unique design component of the High Tech Center program. Because disabling conditions came in a variety of configurations, it made sense that assistive technologies should also. In order to meet the special access requirements presented by combinations of disabling conditions, we developed a set

of adaptations which could be assembled like building blocks into many different configurations. This allowed us to meet the needs of students with multiple disabilities or more complex computer access requirements. Creating an access environment tailored to the specific needs of the individual rather than the generic requirements of a particular disability group reduced the many small difficulties created as a secondary consequence of the disability. Additionally, this individualized environment built confidence and provided significantly improved computer access.

In this way, we established the conceptual framework of the High Tech Center for the Disabled at Monterey Peninsula College. What happened next we could not possibly have imagined.

Over the course of the following two years, word of the program began to circulate; first to neighboring community colleges and then to colleges across the State. The few early visitors to the program grew into a steady stream with visiting faculty often occupying more than half the classroom. In late 1985, two events critically altered the future of computer access for disabled students in California community colleges.

After several visits to the High Tech Center at Monterey Peninsula College, Bob Howard, then statewide director of Disabled Students Programs and Services for the California Community Colleges Chancellor's Office, determined that the High Tech Center program was a valuable resource which should be made available statewide. He proposed establishing a large scale research, evaluation, and training facility in Sacramento which would be available to DSP&S program directors and staff at all 107 California community colleges.

At about that same time, Keith Foster, then the Educational Consultant for the California State Department of Rehabilitation, became convinced that improved computer access could be of great benefit to Department of Rehabilitation clients enrolled in the community colleges. The cost effectiveness and software transparency of the High Tech Center approach solved many of the access problems D.R. had encountered with computers in the past. Department of Rehabilitation was also particularly interested in the capacity of assistive technology to provide important new avenues of opportunity for persons with acquired brain injuries or learning disabilities.

In early 1986, a Federal Establishment Grant was identified by D.R. as a funding mechanism through which assistive computer technology hardware and software, as well as instructional staff, could be placed at several California community colleges. Through a cooperative undertaking between the California State Department of Rehabilitation and the California Community Colleges Chancellor's Office, with funding administered by the Community Colleges Foundation, an innovative plan was developed which would meet the needs of both D.R. and the Chancellor's Office.

The original High Tech Center Federal Establishment Grant was written by Dr. Martha Kanter and Carl Brown during a hectic one week period prior to moving to Sacramento in order to create the High Tech Center training facility envisioned by Bob Howard. Arriving at the Chancellor's Office, acting High Tech Center Director Carl Brown found that the office, equipment, and staff said to be ready for operation consisted of one six by eight foot cubical (unfurnished), one computer terminal (occasionally working), one telephone (definitely not working), one typewriter stand (broken), and no staff. So, starting from essentially nothing, we began the process of building the program.

Although the initial plan for establishing the High Tech Center in Sacramento called for locating the facility on a nearby community college campus, that did not prove to be possible. Instead, the HTC was settled into a portion of the first floor of the Chancellor's Office building where it remained until the Summer of 1990. Staff were hired, equipment obtained, and work begun on the implementation of HTC Establishment grant.

The model for creating Establishment grant funded High Tech Center programs was based on a standardized package of assistive computer hardware and software proven through use at Monterey Peninsula College. Hardware and software used by the Acquired Brain Injury/Learning Disabilities program component was selected by a state-wide DSP&S advisory committee of instructional specialists.

Providing colleges with a fixed array of equipment allowed us to structure the complex task of training and technical support in a manageable fashion. Faculty support and training were, and continue to remain, mainstays of the High Tech Centers program. Successful introduction of computing technology into an instructional environment requires much more just buying equipment. In addition to formal training in the use of

assistive and instructional technology, several additional layers of support were and are available. The High Tech Center Training Unit continues to provide telephone support, site visits, a state-wide electronic bulletin board system, and advanced levels of technical support for hardware and software operation. Additionally, we have begun the process of helping faculty learn to teach with technology. Integration of assistive and instructional technology into mainstream classrooms continues to be a vital and ongoing process.

Community colleges wishing to participate in the Establishment Grant High Tech Centers program provided a twenty-five percent cash match against the cost of implementing a High Tech Center facility on their campus. Participating colleges also agreed to make every effort to enroll a preponderance (51%) of DR clients in the program. In exchange, they received computers, printers, adaptive equipment, and software valued at approximately $23,000. Additionally, colleges could request up to two full time instructional specialists in the areas of Assistive Computer Technology [ACT] and/or Acquired Brain Injuries/ Learning Disabilities [ABI/LD]. Three days of intensive training would be provided for each specialist plus extensive ongoing training and phone support from the newly established High Tech Center Training Unit in Sacramento.

The High Tech Centers Establishment Grant program proved to be remarkably successful and well received by community colleges. Three major grants were issued: Round 1 in September of 1986 for $1.5 million, Round 2 in June of 1987 for $1.2 million, and Round 3 in September of 1987 for $2.5 million. Additional "continuation" grants provided another $2.3 million dollars in funding for staff and equipment. Fifty-one California community colleges as well as three CSU campuses, one UC and three K-12 or R.O.P.s began High Tech Center programs with Establishment grant funding. All programs are still in operation.

Now in their sixth year of operation, High Tech Center programs are in place at eighty California community colleges. All programs are now locally funded and receive a small yearly program augmentation from an $800,000 High Tech Center operating fund created by the California legislature. The programs continue to grow and expand. On any given day, over six thousand students with disabilities are enrolled in community college High Tech Centers.

The computer access model and technologies developed in the California community colleges have been adopted by many California State and University of California campuses. Additionally, some twenty-five other states have begun programs based on the California community colleges High Tech Centers model. Perhaps most significantly, the computer access technology we have implemented has influenced development of Section 508 of the Rehabilitation Act and will likely serve as a guideline for determining appropriate workplace accommodation under the Americans with Disabilities Act.

The success of the High Tech Centers program is the direct result of commitment, dedication, hard-work, and boundless enthusiasm by hundreds of faculty and staff in the Disabled Students Programs and Services departments of California's community colleges. Equally important and indispensable to overall and ongoing program success have been the efforts of the many High Tech Center Training Unit support, technical, and training staff past and present.

In six short years, we have helped create the new academic discipline of Assistive Computer Technology, expanded academic and employment opportunities for thousands of students with disabilities, set a national standard for assistive computer technology in higher education and, perhaps most importantly of all, taken significant steps to assure that access to information technology will remain an open doorway for persons with disabilities.

Carl Brown, Director
High Tech Center Training Unit
Wednesday, May 27, 1992

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