ASSISTIVE TECHNOLOGY IN US HIGHER EDUCATION: THE UNIVERSITY OF WISCONSIN- WHITEWATER EXPERIENCE

John D. Truesdale and Connie Wiersma

University of Wisconsin-Whitewater

Abstract. The advent of the personal computer age has significant implications for the lives of individuals who happen to have disabilities. It also has significant implications for the system of service delivery of computers and other assistive technology. New paradigms of service delivery may be needed to take full advantage of the power of technology systems. It is suggested that the introduction, training and use of computers is most effective when it is part of a comprehensive, multi-disciplinary team approach and based on the philosophies of human development and independent living.

1 Introduction

At the Third International Conference on Computers for Handicapped Persons, Scherer (1992) pointed out the need to use a model of service delivery which would assure the successful introduction and use of assistive, educational and workplace technologies. According to Scherer, "...the integration of technology into a setting is a complex and multi-faceted task.". Our experience tends to confirm Scherer's position. It is essential to take into consideration the environment in which you are working, the individuals with whom you are working, the future environment(s) in which those individuals will be working, and match the technology to the present and future needs of the individual.

2 Environmental Context

The University of Wisconsin-Whitewater (UW-W) established a formal program to provide services for students with disabilities during the 1970-71 academic year. At the time UW-Whitewater

initiated its program to serve students with disabilities, there were few such programs in existence nationally. UW-Whitewater adapted its service delivery from the program to serve students with disabilities at the University of Illinois. The Illinois program was started in 1947 to provide services for disabled military veterans. It followed the medical model and provided comprehensive, multi-disciplinary services such as the various medical specialties, allied health professions, therapeutic recreation, counseling, transportation services, and personal care services. With a record of educational and vocational success with disabled veterans, the program soon attracted civilians with disabilities from around the United States. These students also experienced the same degree of success as did the veterans. It was presumed that the success of these students could be attributed in large measure to the program model.

3 Needs of Students with Disabilities

A common belief in United States higher education is that college students usually drop out because of academic failure. However, it is estimated that fewer than 15% of all student drop outs result from academic dismissal. Decisions to withdraw most often relate to personal, social or financial problems (Hackman & Dysinger, 1970; Noel, 1985; Pantages & Creedon, 1978). In addition to the stresses of entering into an entirely new life experience, students with disabilities are often confronted with many new challenges that are not faced by their nondisabled peers. For example, it may be quite traumatic for a student to move from his/her home and a supportive community network and family members as care givers to a residence hall where virtually everyone is unknown and care givers are available on an hourly basis. That individual may now be called on for the first time to be self-directing and self-managing. They may lack sufficient life experience to feel competent in addressing these issues in addition the transition issues faced by all students. The multi-disciplinary team bridges the gap between family and campus by thoroughly evaluating student needs and making recommendations for equipment, environmental modifications, physical training, health care, mobility needs, arranging for personal care needs and so on. The efficacy of the comprehensive, multi-disciplinary approach is partially reflected in retention data for students with disabilities at UW-Whitewater. Between 1985 and 1992, the average rate of retention of students with disabilities on our campus was 75%. This was significantly higher than the retention for the student body as a whole. This has occurred in spite

of the ever increasing severity of disabilities presented by our students. Computers have played a significant role in permitting us to maintain this level of retention.

4 Computers in a Multi-Disciplinary Environment

Our initial venture into adapted computing occurred in 1989. We set-up a WANG AT 286, with only 640 mb of RAM to provide limited services to students who were blind or otherwise print impaired. We purchased and loaded a braille conversion program and a screen reading program. We attached a braille printer, a laser printer, an OCR scanner, and a DECTalk to this machine. We used every slot in the machine and every available byte of RAM to operate this system. The machine did not have the capacity to use a screen enlarger, or we would have loaded that also. We also learned, during this process, that compatibility is a major concern. When we investigated hardware, software, and adapted equipment and asked manufacturers questions about whether their product would work on our system or our network, we were frequently told that they really did not know--that we would have to try it to find out. This situation has improved over the past several years, but we still often find ourselves operating under the trial and error method.

Our center opened in 1990 with four DOS-based and four Apple Macintosh computers. The eight machines were linked together via a Novell Network. These machines and the network were of the same type being used in the "main" computer lab on campus. The same basic software programs used in the main lab were made available in the adapted computer lab. A laser printer was attached to the network to provide for quality output.

The Assistive Technology Coordinator was given responsibility for the overall functioning of the lab and to arrange for the delivery of services. Basic equipment purchased included easily adjustable furniture, which probably provides access to more people than any other single adaptation available, a screen enlarging program, alternative "mice", including the "headmaster" and keyguards. Access issues were and continue to be addressed on an individual basis. The students participate in this process. They "try-out" various pieces of equipment or configurations and decide what works best for them. Simple accommodations, such as placing the keyboard on the tray of a student's wheelchair, especially in situations where strength, reach and range of motion are at issue, are solutions that are often preferred over expensive equipment. One student found that placing the keyboard on a music stand next to her wheelchair, and typing using a dowel stick with some "goop" on one

end and a pencil with an eraser provided her with all the access she needed to operate the computer. Her arms were crossed and "frozen" across her chest, her hip and leg joints were frozen so that she was positioned nearly lying down in her chair. But she could use her fingers and was able to type very rapidly. She also became a Macintosh "whiz" and served as supervisor/scheduler/trainer for the student workers in the facility. When she graduated and left school, she took her knowledge and "solution" with her and is gainfully employed by Hilton Hotels in Chicago. Naturally, she uses a computer to perform her work tasks.

4.1 Organization of services

Assistive technology services are divided into several components: general computer usage, assessment of needs, training, advocacy for obtaining equipment, assistance with set-up and training on individual systems, assistance with trouble-shooting and/or having equipment repaired, and outreach.

Interrelated to the general lab operations is the assessment of needs and the provision of training. Students with personal care needs undergo a pre-enrollment evaluation. This includes an informal evaluation of their computer-related needs. After they arrive on campus, a formal technology evaluation is completed. Students have the opportunity to work extensively with the computers and adaptive equipment in an attempt to determine what hardware and software will best meet their needs. Many students have received assistance from our staff to identify the equipment and software they need based on their functional needs, academic major and vocational choice. In most cases we have been able to identify resources to purchase that equipment. We frequently provide a copy of the evaluation and rationale for the equipment to help them justify the purchase. Once students receive their equipment, we assist them with set-up and training needs as may be necessary..

Unfortunately, over the years, we have seen too many students who have participated in technology evaluations (elsewhere, of course), had equipment recommended and purchased for them, but failed to fully utilize it when received. There appears to be a gap, at least in our area, in providing for training and support services for the individuals, including repairing equipment when it does not work properly. A young woman, who entered our University this past fall had her own laptop computer with the program, Words+, for augmentative communication. She had the computer and the program available to throughout her secondary education.

Unfortunately, the computer did not have sufficient memory to run the speech program. The result was that she simply did not use it.

We assist our students to set up and learn to use their adapted hardware and software so that it is functional. It can be very frustrating to students when their equipment is not adequate to meet their needs or when it does not work properly. A young man, who needs to use his computer for all of his writing needs because he has no arms, was referred to an evaluation center to determine what computer technology would best meet his needs. Unfortunately, the equipment recommended was not adequate. The evaluation center had recommended the purchase of a voice-activated system that the manufacturer stated should be used as an evaluation tool or for students in their first or second year of high school. Other equipment included a CD-ROM and a scanner. However, the computer had only enough memory to load the voice program, but not enough to operate the voice program and the various software programs that he needed to actually do his work. We have attempted to help him correct these problems. More memory will be purchased for his system so that he can at least run his programs. He will have to "live" with the second-class voice-activated system and make the best of it, at least for the present time. In the meantime, the academic year ended before his system was even made operational, even though he received his equipment near the beginning of the first semester and we worked closely with him during the entire academic year.

Our center also serves our students by assisting them with maintenance concerns, including obtaining repairs or replacement parts. A well-meaning agency purchased a laptop computer for a student who had experienced a traumatic brain injury. However, they failed to purchase the software needed to use the computer. The student came to the Assistive Technology Center for assistance in selecting appropriate software to use on her machine. It was determined that she planned to use the computer to do word processing. We had this student use a laptop from the Center loaded with the program Word Perfect in the Windows version. The student used different types of "mice", deciding on a "standard mouse" rather than the clip on track ball that came with the computer. We modified the program and streamlined her access to it as we worked with her. She came in almost daily for the next two months to learn to use the computer, initially sitting in the office of the Center coordinator to receive assistance when needed. Due to a short term memory loss, it was necessary to repeat some instructions over and over until she had "learned" them. Some instructions were also written out for her to use. Finally, we were able to recommend

software and a mouse for her to use on her own computer. The recommended items were purchased and her system was configured by us. The mouse provided by the vendor did not work on her machine, so arrangements were made by ATC staff with the vendor to obtain the correct item. Additional training was indicated to become functional. Further, it was discovered that her machine would need more RAM (memory) to run the software efficiently. Once received, ATC staff installed the card and the student now uses her computer regularly and is progressing nicely with her academic course work. Ever increasing numbers of students have their own computers and equipment and are in need of support services to keep it working properly. Most services are delivered by the Coordinator of Assistive Technology and student workers. However, we frequently consult with other professionals in our department, the computer lab staff from the main lab on campus, manufacturers and vendors. Information is also obtained from attending conferences and training sessions.

The final area of our services involves outreach. Students from classes at the University, such as business education, have toured our lab to learn more about meeting the needs of students with disabilities in the area of technology to better prepare them for teaching at the secondary level. Individuals from the community are welcome, and do come to our center to learn what is available that might be helpful to their children or a family member who has a disability. We are willing to share what we have learned with others who are working in this field, and to also gather information and learn from others in forums such as this conference.

4.2 Areas of concern

We know that we must make continuing education a priority, as technology is changing almost faster than our ability to apply it. It is often difficult to draw the line and say, this is what we are going to purchase or learn how to use when we know that by the time we have done so, that particular item may have become obsolete.

We see tremendous possibilities for persons to access computers through voice-activated systems. We took delivery of our voice-activated system in April of this year. We purchased the entire system for less than the voice-activated system alone cost just last year. The learning curve is a bit steep, but for many of our students it is the only method currently able to provide them with computer access. At this time, these systems work with DOS-based programs and "Windows". As users migrate to the Windows environment, visually impaired users may be at a disadvantage unless DOS-based adaptations are ported to the Windows environment.

For those with speech impairments, using technology may greatly enhance the ability to communicate. Access is still an individual matter, where input and output methods are basic considerations and we must continue to find ways for persons with disabilities to be included as new technology becomes available.

4.3 Conclusion

We believe that college students with disabilities in the United States benefit from a multi-disciplinary approach to the provision of services. The philosophy of service should follow that of the Independent Living model or other developmental approach with an emphasis on behavior or performance by the individual. Assistive technology is a very important service component for students with disabilities. It is strongly recommended that expertise be developed on or near a campus that focuses on knowledge of the various disabilities, knowledge of the various computers and software applications, knowledge of adaptive hardware and software appropriate for each disability, teaching students how to use their hardware and software, and, the provision of follow-up services to assure efficient use of their system.

References

- Hackman, R. & Dysinger, W. (1970). Commitment to College as a Factor in Student Attrition. Sociology of Education, 43, 311-324.
- Noel, I. (1985). Increasing Student Retention: New Challenges and Potential. In I. Noel & R. Levitz (Eds.). Increasing Student Retention. San Francisco: Jossey-Bass.
- Pantages, T. & Creedon, C. (1978). Studies in College Attrition: 1950-1975. Review of Educational Research, 48, 49-101.
- Scherer, M. J. (1992). Psychosocial Influences on Computer use by Persons with Disabilities: A Preliminary Model and Theory. In Zagler, W. (Ed.). Computers for Handicapped Persons. Vienna: R. Oldenbourg.