CHAPTER 2

Review of Related Literature

Conceptual Framework

The purpose of this study is to raise issues and problems involving AT services in academic libraries and to suggest guidelines for addressing these issues and problems. Reaching consensus regarding a set of guidelines for this study will provide a useful planning tool for academic librarians, postsecondary administrators, disability service providers and assistive technologists.

Individuals who exhibit failures in tasks relating to using print materials may benefit for AT and may be able to function at the same level as their peers in a library setting if they are provided with the appropriate AT. Galvin & Scherer (1996) insist that it is no longer enough to simply provide a person with a technology. It is necessary to demonstrate that the technology will improve a person's quality of life or provide equal access and that the service is cost effective and is an efficient use of staff time. Likewise, the mirrored research conceptual framework (Appendix A) illustrates the necessity of including input from multiple sources when determining an appropriate technology for an individual. The review of the related literature includes material within this conceptual framework that helps to establish a base for further research in this area.

Defining the Need for AT

The Assistive Technology Act (ATA) defines AT as a technology designed to be utilized in an AT device or AT service. AT includes any item, piece of equipment or product system whether acquired commercially, modified or customized that is used to increase or improve functional capabilities of individuals with disabilities. AT services

indicate any service that directly assists an individual with a disability in the selection, acquisition, or use of an AT device. The evaluation of the AT needs of the individual include services involved with providing for the acquisition of the AT, selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing or replacing AT and the coordination and use of necessary interventions or services with AT, training or technical assistance for an individual with disabilities and training and technical assistance for professionals (ATA). The ATA emphasizes the functional capabilities of individuals with disabilities and underscores the importance of treating each application of AT as a unique circumstance. Functional results require the maximization of individual skills (Cook & Hussey, 1995).

The ATA includes several specific examples that clarify the definition including evaluating needs and skills for AT, acquiring AT, selecting, designing, repairing, and fabricating AT systems, coordinating services with other therapies, and training individuals with disabilities and service providers to use AT.

Despite the growth in interest, application, and training, there has been a lack of carefully articulated principles and practices in the emerging AT field (Cook & Hussey, 1995). Research and evaluation in the area of AT is crucial at this point as more and more postsecondary institutions are utilizing AT as an accommodation under the ADA.

Weingand (1997) describes the importance of planning for crisis in proactive library management. She states that “planning and forethought can prevent crippling emotion by providing the opportunity to think through the what if’s and make tentative decisions before actual crisis points occur.” (p.39) Library special services research is

needed to provide information and guidelines for academic librarians who are developing proactive policies for serving individuals with disabilities.

McGuire (1997) remarked, “little research is available to demonstrate a scientific basis for establishing that specific accommodations are effective.” (p. 16) Similarly, Raskind & Higgins (1998) mention that there is no nationally representative study of AT service delivery for students with disabilities.

AT was the category with the highest overall mean in Reilly’s (1997) Delphi study to identify standards related to the ADA that are desirable for colleges conducting a program accessibility self-study. Additionally, her study indicated the importance of providing technology training, equal access, and ongoing research (Reilly, 1997).

Assistive Technology Studies

Seelman (1999) noted a new paradigm emphasis on the individual and the environment. Seelman (1999) further noted that this new paradigm emphasizes the interface between the individual and the environment and has been articulated by the Tech Act Projects, the National Institute for Disability and Rehabilitation Research, and other agencies. However, there have been few research projects that have used this paradigm in the postsecondary environment. Hyman, Miller & O’Brien (1988) contend that the present dissemination of AT is limited in part to poor communication channels and uneven evaluations dominated by anecdotal self-assessment by manufacturers.

Some AT companies have anecdotal or case study material. Few of these documents are related to postsecondary students. The only company that responded to inquiries for this study that had conducted studies with AT for postsecondary students with disabilities was Kurzweil. Elkind (1998) conducted a study for Kurzweil using the

Kurzweil 3000 with a group of twenty-six students with LD at De Anza Community College in Cupertino, California. Three components were the basis of this study: speed, comprehension, and motivation (stress and fatigue). The participants who used the Kurzweil 3000 who were slow readers increased their reading rate substantially, while those whose unaided reading rate was fast, read more slowly. Elkind's regression model based on these findings predicts that individuals with an unaided reading rate less than 176 words per minute (wpm), the approximate speed of normal speech, will read faster with the Kurzweil 3000. Conversely, those students whose unaided reading rates are greater than 176 wpm will have degraded performance using the Kurzweil 3000. Some of the participants in the study more than doubled their unaided reading rates. The results for timed and untimed comprehension are similar.

Similarly, an eight-year longitudinal study tracking over 400 students at the California State University Northridge (CSUN) found that a technology that is beneficial for one individual with LD might be counterproductive for another (Raskind & Higgins 1998). Raskind & Higgins' (1998) research was mainly anecdotal, highlighting results with Xerox's BookWise reader (the predecessor of the Kurzweil 3000) and Arkenstone's Open Book. Higgins & Raskind (1997) found that students whose reading rates increased also showed gains in comprehension.

Students with Disabilities & Assistive Technologies

Most academic librarians agree that libraries should provide AT in order to level the playing field for all library patrons. Lenn (1996) states that "the library needs of people with disabilities are no different that those of any other patron. The only difference may be in the way that information is accessed."(p. 41) Weingand (1990)

noted that the information needs of persons with disabilities must be approached by means of different reference strategies.

Scott (personal communication, Feb. 11, 1999) indicated that students with print disabilities in a library that is predominantly a print based environment, might encounter difficulties with both hard copy and electronic text. Some of the specific difficulties that she noted included: processing deficits, sequencing difficulties, memory deficits, visual processing difficulties and expressive or receptive language deficits. These difficulties could cause problems with traditional library activities such as literature searches, locating books on the shelves, completing reserve readings within the allotted time, accessing materials, using microfiche.

Access Options & Assistive Technologies

Libraries, need to plan for and implement accessibility measures in order to comply with federal legislation mandating equity of access to public resources for patrons with disabilities and to ensure that computers are an aid rather than a barrier to library use (Berliss, 1992). Berliss (1992) recommends that about 10% of the academic library computer resources should have accessibility options since about 10% of the students have disabilities. The National Survey of Desktop Computing in Higher Education (1998) indicated that less than 50% of U.S. colleges have strategic information technology plans and that more than 60% do not have an instructional technology financial plan (Green, 1998). This lack of overall planning for technology has implications for AT funding, since AT funds are in many cases allocated through instructional technology budgets.

The main difficulty that most students with print disabilities noted was using the automated card catalog (Hilton-Chalfen, 1992; Lenn, 1996; Mendle, 1995; Michael, 1988; Weingand, 1990 and). Hilton-Chalfen (1992) mentions that historically, library patrons with print disabilities have had to rely on the assistance of others to gain access to many basic library resources: card catalogs, reference materials, books, and journals required a reader. Huang (1989) defines a successful program for individuals with disabilities as one that encourages all students to use library resources independently.

Many patrons with print disabilities can benefit from large print materials. Large print is considered 14 points or larger (American Printing House for the Blind, 1999) (APH). McNulty (1993) lists several standard library reference sources that include materials that are available in large print. Bowker's Annual Complete Directory of Large Print Books and Serials lists over 6,000 book entries produced by over sixty publishers. Books and periodicals included in the directory must have at least 14-point type. The APH offers a number of large print textbooks for college students. Additionally, materials may be easily enlarged and photocopied in most libraries.

Computerization of information has enabled patrons to read who have print disabilities. Hilton-Chalfin (1992) recommends that at least one workstation should be available for patrons needing enlarged text. Technological information provides access to information that would not be available in any other way (Wright & Davie, 1990).

Accessibility options such as sticky keys and enlarged type or sounds are standard on Windows software. Large computer monitors are recommended for using this software. For patrons who have severe VI sometimes telesensory cards and software are

linked with a personal computer to a large-screen VGA monitor and a Closed Circuit Display (CCD) camera and a separate video/TV monitor (Mendle, 1995).

Optical scanning equipment enables text to be scanned and projected on to the monitor and either read by the voice synthesizer or stored for later use. The material can be converted to a word processing program and edited, and printed on a computer printer or on a Braille Embosser. Patrons can access the on-line card catalog and the Internet and other options available on the library local area network (LAN) using optical scanning devices.

Inexpensive screen magnification devices are sometimes sufficient for helping the student with low vision to read the computer screen. High technology devices may be ideal, however, librarians sometimes attempt to provide an electronic device when all the patron wants or will use is a magnification glass (Lenn, 1993). Good communication between the library staff and patrons with disabilities is essential. Patrons with disabilities are sometimes the best source for advice on appropriate AT (Lenn, 1993). An interactive process is the best method for including patrons in decisions that will affect their use of AT and the library.

Some of the devices or services Lenn (1996) and Weingand (1990) recommend include: talking books; special listening areas; computers for word processing; individual study carrels; optical character recognition and scanning devices; speech synthesis equipment for all automated reference databases; enlarging software; closed circuit televisions; speech input, assistive reading and writing software; tape recorders; provisions for photocopying; and on line database searching.

Library Accommodations for Students with Print Disabilities

Karp (1991) identified some of the universal needs of students with print disabilities. The need for directional assistance, orientation to the building, clear and repeated signage, and clearly identifying staff and service points were among some of the needs that she noted. Identification badges and photographs of staff placed with directional signs and clearly labeled stack areas are helpful. Donley (1990) noted that auditory processing difficulties make it difficult for some students with print disabilities to understand directions. Reading and sequencing difficulties are problematic for the student with print disabilities when using library catalog systems. Donley (1990) recommends a color-coded physical plan for easy location. Michael (1988) recommends that libraries should have visual diagrams of resources and auditory descriptions of resources and services. Deines-Jones & Van Fleet (1995) recommend oral maps or audiotapes of the library for students with print disabilities. These audiotapes should include the exact locations of stacks and other library services and facilities and information about adaptive equipment and services.

Donley (1990) makes the point that libraries are important to students with print disabilities because of their need for individual help, a quiet place, and a variety of resources in different formats. Many of the resources provided for individuals with sensory disabilities are helpful for students with print disabilities and can be adapted to their unique learning styles. Optical scanning devices are useful for individuals with print disabilities. Non-book resources such as videos, computer software and audiotapes are helpful for students with print disabilities.

Donley (1990) and Michael (1988) both stress the critical need for the prospective college student with print disabilities to work closely with the college ADA coordinator and the library staff. A student should examine library services when evaluating a college. Michael (1988) suggests that students check to see if the library offers access to talking books, recorded lectures and recorded textbooks. The student should ask if the library furnishes special listening areas and computers for word processing.

Screening Interviews

An interview with the student with a disability is helpful for eliciting the necessary information to provide appropriate accommodations. The interview may cover areas of difficulty, processing abilities, academic strengths and weaknesses, study and interpersonal skills. Deines-Jones & Van Fleet (1995) recommend the following welcoming etiquette:

Maintain a “person first” attitude.

Use signage to direct people with disabilities to appropriate service points.

Be natural when speaking to people with disabilities.

Make eye contact directly with the person to whom you are speaking.

Weingand (personal communication, Feb. 13,1999) stresses developing a systematic manner for identifying the specific needs of students with disabilities and marketing library services for students with disabilities.

The University of Illinois, Champagne-Urbanna (1999) suggests that a student with disabilities should contact the Students with Disabilities office on campus and request the following information that could specifically apply to libraries:

(a) What services are offered?; (b)What are the names of the director and staff connected with these services?; (c) Can you introduce me to a student with my disability so that I can learn from that person's experience?; (d) What arrangements do those students make?; (e) How early does a qualified student have to start to make arrangements for putting textbooks on audiotape?; (f) Are readers paid or volunteer and who pays?; (g) Are large print computer programs available?; (h) What AT is available?; (i) Where is the AT located?; (j) Is there AT training available?

McNulty (personal communication, Jan. 19, 1999) discusses the importance of encouraging students to disclose their disabilities to librarians and support staff. He stresses using a positive approach when interviewing students to determine what they will need to succeed in college.

Galvin & Scherer (1996) cite the failure to consider user opinions and preferences in technology selection as the main reasons for AT abandonment. Some other reasons they cite for students not using AT devices include the lack of training, environmental obstacles, and the lack of information or support for maintenance and repair.

Equal Access

The American Library Association (ALA) stresses that the concept of universal design should be the first item to consider when planning for equal access. Universal design is the philosophy and practice of planning facilities and services so that they are useable by the widest range of people. "People with disabilities should not be an afterthought." (ALA/ASCLA, p. 1)

The ARL (1991) suggests that librarians can accomplish the goal of equal access in a variety of ways: (a) book retrieval and assistance with writing down call numbers;

(b) telephone information and retrieval services; (c) modifications in lending rules for course reserve materials; (d) online database assistance; and (e) photocopy assistance. Providing AT and individual instruction and orientation.

Gustafson & Langan (1990) and Michael (1988) emphasize the importance of libraries providing special listening areas, calculators, computers, individual study carrels, optical character recognition equipment and tape recorders. Deines-Jones & Van Fleet (1995) stress the need for providing low cost assistive devices for library patrons to function independently. Some of their suggestions include providing a periscope for patrons to view shelf titles and call numbers and tong type grabber devices for reaching books on higher shelves. Deines-Jones (1999) mentions the need for providing voice interface devices in a separate room for patrons with low vision. Voice interface devices are also helpful for individuals who have reading or comprehension difficulties. Graphic User Interface (GUI) devices allow access to CD-ROM products, World Wide Web sites and other multimedia. The library should provide on-line database searching, photocopying, individual librarian assistance and provisions for talking with a librarian in a quiet place. A policy manual describing services for students with disabilities is a helpful planning tool.

Galvin & Scherer (1996) advocate establishing a peer support network for individuals who are using AT in an institutional setting. These individuals can provide each other with information and serve as mentors.

Students with Disabilities & Underserved Needs in Academic Libraries

Despite the availability of AT many individuals and institutions do not use these tools. Some reasons for this include a lack of information and training, poor attitudes

toward technology, poor attitudes toward individuals with special needs, dependency on a caregiver and unwillingness to use AT and become independent of the caregiver.

Students with print disabilities sometimes comprise an invisible category and are not offered services because they do not disclose their special needs (Weingand, 1990). Velleman, (1990) suggested that persons with mild disabilities have a greater need to hide and deny the disability, thereby thwarting adjustment. Gardner and Ellis, (1998) have found that freshmen with print disabilities, describe their high school education as teacher dependent. As students become more responsible for their education, they become more involved and committed. For this reason, Gardner & Ellis (1998) emphasize the importance of not reinforcing passive student attitudes.

Older adults who have not had access to IDEA services and who return to college may have not been diagnosed as having a print disability (Weingand, 1990). Print disabilities are sometimes inconsistent. Adults who may have seemingly overcome a print disability may find that it resurfaces in college due to the stresses of college life.

Special Services Librarians

Lenn, 1996; Mendle, 1995; Michael,1988; and Weingand, 1990 suggest designating a librarian who acts as a resource advocate for students with disabilities. Deines-Jones & Van Fleet (1995) stress the need for appointing a librarian to keep informed of advances in AT. Michael (1988) and Weingand (1990) both note the importance of a librarian meeting with students with disabilities to determine what specific services are needed. Gustafson & Langan (1990) and Weingand (1990) recommend that libraries should market their services for patrons with disabilities more

aggressively. They contend that many students with disabilities are not aware of special services offered by their libraries.

Weingand (1997) discusses the primary characteristics of the library paradigm pioneer. These characteristics apply to library services in general and would also have application for special services librarians since the technologies and services that they offer are in many cases in the formative stages. The paradigm pioneer displays three primary characteristics:

"A special kind of knowing, or intuition: an ability to make good decisions with incomplete information.

Courage: the willingness to move forward in the face of great risk.

Commitment of time: the time it takes to go from a rough concept to a working paradigm" (p. 71).

(Mendle, 1995; Michael, 1988; and Weingand, 1990 all agree that technology can never substitute for personal kindness and sensitivity. Michael (1988) lists individual librarian assistance for reference and instruction with AT as being the most essential factor for students to consider when evaluating libraries.

Library Staff Awareness & Development

Weingand (1997) stresses that librarians with the best service orientation will find it problematic to provide a high level of service if the operating environment does not encourage and empower the staff to provide this level of service. Walling (personal communication, Feb. 11, 1999) recommends staff training about print disabilities, especially invisible disabilities using simulations. Switzer (1994) stresses the importance of library staff becoming aware of disability issues. The library should offer

staff development programs to increase awareness of disabled users' needs and to sensitize library staff to their limitations (Huang, 1989). Deines-Jones & Van Fleet (1995) mention the necessity for librarians at all reference points being aware of AT that are available for students with disabilities and being trained to use this equipment.

Librarians should schedule times for learning about the needs of individuals with disabilities and for keeping abreast of the rapidly changing AT (Huang, 1989). A good beginning point is the creation of awareness programs such as Roads to Learning (ALA,1997) program for patrons with disabilities. This resource includes a reference interview sheet and questions for staff discussion about the reference interview, suggestions for sessions and study groups to foster awareness and sensitivity, inventory and action plans for signage and handouts, plans for collaboration with national disability organizations, marketing and public relations strategies and audience analysis, how to develop an advisory group. This workshop also includes materials that can be distributed to patrons with disabilities such as general InfoSheets including definitions, common signs, lists of organizations and Internet resources, and assistive options on online public access catalog terminals and other library computers.

Most states have an office of vocational rehabilitation (VR) whose staff offers programs for libraries and other agencies. The Library of Congress National Library Services for the Blind & Physically Handicapped has prepared pamphlets and guides to journals, books, and other special sources. Library staff should have access to information regarding these resources. Individual libraries may find their states Tech Access Center by going to http://www.ataccess.org or by calling their state's department of education.

Locating a good local AT vendor with experience across a wide variety of disability areas is another important step for keeping abreast of new AT and for providing staff training. It is important to cover the full range of disabilities when developing library plans and training opportunities. "Many libraries mistakenly think that they only need to concern themselves with serving people who are blind or visually impaired." (ALA/ASCLA, 1999)

The campus or library disability advisory group can be a valuable source for individuals who can provide training and resources for library staff and for individuals with disabilities. Students and other individuals with disabilities who use AT would be another source for training.

Academic Librarians Attitudes toward Students with Disabilities

Switzer (1994) recommends an ongoing awareness and attitude program as a part of the library's staff development plan. However, there has only been one national study, Dequin, Schilling & Huang (1988), that surveyed academic librarians' attitudes toward persons with disabilities. This survey was conducted prior to the publication of the ADA guidelines (1990). One hundred forty-six academic librarians responded to the Attitudes toward Disabled Persons, Form – O (ATDP-O), and an ATDP-O score was computed and correlated with responses to the demographic information by means of a *t* test.

This study indicated that librarians in the under 29-age group had more positive attitudes toward the disabled than other age groups. None of the respondents had been enrolled in a library course for individuals with disabilities. A significant difference (p + .035) was indicated at the .05 level of significance for librarians who had a disabled family member. The attitudes of over 50 percent of the surveyed academic librarians

were considered to be slightly positive. This implies that the attitudes of many other academic librarians need improvement (Dequin, Schilling, & Huang, 1988).

Dunlap (1999) conducted a study using the Scale of Attitudes toward Disabled Persons (SATD) with a group of library school students and Ohio librarians. His study indicated that both groups had highly positive attitudes toward people with disabilities.

Evaluating AT for Libraries

Evaluation of AT is crucial for maintaining quality resources. The Trace Center at the University of Wisconsin, the Illinois Assistive Technology Project, The Council for Exceptional Children: Technology & Media Division, Closing the Gap and VR offices all evaluate AT.

State Assistive Technology Projects

Individuals may obtain information and assistance through the VR. The VR provides information and assistance on accommodation requirements such as computer accessibility devices and augmentative communication devices such as electronic communication devices and speech synthesizers, assistive listening, telecommunication devices, closed caption television, large print books, brailled materials, cassette tape recordings and mobility guidelines. They provide information on promoting computer accessibility, selection criteria, and the adaptation of hardware such as expanded keyboards, touch screens, Braille display, using environmental controls such as remote control switches, Velcro attachments, and pointer sticks.

Legal Issues

Legal issues have come to the forefront in academic libraries in recent years. There was no substantial litigation in this area until 1990. There are two explanations for

the increase in litigation. First, the number of college students with disabilities has increased dramatically. Second, the passage of the ADA has increased awareness of the availability of protections from discrimination (Rothstein, 1994). A brief review of the primary legislation concerning libraries is provided in this section.

The ATA provides an avenue for individuals with disabilities to explore the use of AT. Specifically, this act states that "consumer-responsive programs of technology-related assistance for individuals with disabilities shall be equally available to all individuals with disabilities regardless of their type of disability, age, income level, or the type of AT required." (ATA, 1999) The ATA defines consumer-responsive AT as policies and principles that are consistent with

i.) respect for individual dignity, personal responsibility, self-determination, and pursuit of meaningful careers, based on informed choice, of individuals with disabilities;

ii.) respect for the privacy, rights and equal access of individuals;

iii.) inclusion, integration, and full participation of such individuals;

iv.) support for the involvement in decisions of advocates for individuals with disabilities in the planning and training process (Section 3, B, 7, i-iv).

The ADA protects the civil rights of people with disabilities and requires that postsecondary institutions provide AT services for them. Once students have been admitted to college, it becomes their responsibility to self-identify and to provide documentation of their disability.

The ADA brought the needs and rights of persons with disabilities to the national forefront. This legislation creates the impetus for change through fear of lawsuit (Lenn,

1996). Lenn (1996) observes that libraries should thrust themselves into the spirit of the law and strive to be proactive in forming policies and determining services for patrons with disabilities.

Most of these issues involve The Rehabilitation Act, Section 504, (1973) or ADA complaints related to discriminatory practices with regard to AT. A stated purpose for the enactment of the ADA was to remedy educational discrimination against individuals with disabilities. Despite the passage of Section 504 in 1973, Congress found in 1990 that people with disabilities continued to suffer critical discrimination in numerous aspects of life including education (42 U.S.C. § 12101(a)(3) (1988 & Supp. V 1993).

The ADA is a civil rights act and not an entitlement program. Unlike the IDEA, no funding is provided for mandated services. The goal of the ADA is to guarantee that individuals with disabilities are not discriminated against or denied equal access to the same programs, services and facilities available to others (Gordon & Keiser, 1998).

The Rehabilitation Act of 1973

Postsecondary education programs that receive benefit from federal funds must "take such steps as are necessary to ensure that no handicapped student is denied the benefits or excluded from participation in, or otherwise subjected to discrimination because of the absence of educational auxiliary aids for students with impaired sensory, manual or speaking skills." (The Rehabilitation Act of 1973, Section 504 ¶34 C.F.R. S. 104.44) (d)(1).

The courts have traditionally considered the following elements in proving discrimination on the basis of disability under Section 504: (a) the program must receive

federal funding; the plaintiff must have a disability as defined by the Act; the plaintiff must be otherwise qualified.

Conclusions from the Review of Literature for AT & Academic Libraries

The common characteristics of persons with print disabilities identified by Lenn, 1996; Mendle, 1995; Micahel, 1988; and Weingand, 1990 include deficiencies in reading skills, written language skills, oral language skills, organizational and study skills, and social skills. These students are able to cope on an equal basis with their non-disabled peers in a library setting using AT. The most essential element of a successful library program for patrons with print disabilities is a caring, informed staff. Services should be publicized so students feel comfortable with disclosing their disability and suggesting accommodations.

Today's college students are more aware of AT. AT will become more available in the schools because it will be implemented as a means of meeting Individual Education Program requirements in the public schools and because the cost of these technologies continues to decline. As the cost of AT becomes more reasonable, these items will be perceived by individuals and by the courts as being more readily achievable.

There have not been any national surveys since the Gustafson (1987) and Donley (1989) studies. These surveys were conducted prior to the implementation of the ADA and the ATA. More research is needed using a problem-based management approach as indicted by Robinson (1998) to identify the problems and to suggest practical solutions for postsecondary special library services. The Delphi Technique is one such method, which utilizes a problem-based management approach.

CHAPTER 3

Methodology

This chapter begins with a story based on the practices and rituals of the ancient Oracle at Delphi. The purpose of the story is to illustrate the reliance of the priest at Delphi on the information that was provided to him by political and religious experts. The story may further imply the need for an expert Delphi medium in a modern day context and the need for implementing the results suggested by this medium within a conceptual framework of other educational research. This chapter continues to summarize the purpose of the study and includes a description and justification for using the Delphi Technique and a description of the design of the study, selection of the Delphi panel, data collection procedures, instrumentation, and data analysis procedures.

The Delphic Oracle

They spoke in low muffled tones. How shall we deliver the news to the people? She dipped her long dark hair in the warm Castalian spring once more. She had heard enough of the conversation to know that another battalion of Spartan soldiers had been dispatched. Alexander's servant, Orestes came often to visit Karamos, the priest at Delphi in the early morning hours when the people would not see him.

The mothers' wailing could still be heard at the edge of the woods. They had offered their first-born sons the day before to Apollo. Erastus had been the first to bring little Latimus to present him to the priest. Karamos massaged the ceremonial mixture of olive oil and myrrh over Latimus' tiny body and held him up the sky. "May the gods be pleased to bless the people with peace and fertile fields."

The servants had prepared the fire for the sacrifice. Karamos quickly laid the child on the fire and drew his knife from its sheath to cut the childs' throat. "May Apollo be pleased to accept the blood of this infant and to save the blood of the soldiers of Greece. May this mother have many more sons to defend Sparta." Erastus had watched from the edge of the woods as the last embers of the fire died and the servants swept the ashes of her son away from the temple.

The stench of human flesh filled the air as Pythia ascended the stairs. It was the seventh day of the month, the day when she would mount the triangle and deliver the oracle to the people. The mothers waited, praying that Apollo had been pleased with their sacrifices and that the priest would say that the war would soon be over.

Dark clouds loomed on the horizon. Lightning struck angrily across the sky. Loud thunderbolts signaled an oncoming storm and the displeasure of the gods. The wailing of the women became louder. The mourners lead the women and the towns' people to the front of the temple. Pythia joined them as they began to dance. She could not see their veiled expressions but she could feel their gloom. She allowed her mind to embrace their blackness and her spirit was soon transformed by Apollo to deliver the frenzied oracle that the people were waiting to hear.

Dancing wildly to the music before the crowd, Pythia started toward the triangle. The sulfuric fumes from the chasm combined with the smell of the human sacrifices in the humid morning air. Pythia mounted the triangle over the chasm and sat in a hypnotic trance. She began to fling her arms and to jerk her body uncontrollably as she delivered the babbled oracle and then fell to the ground, an exhausted messenger of the gods.

A stillness fell over the crowd as they reverently waited for the interpretation of the oracle. Karamos motioned for the servants to bring him a writing tablet. The people watched as he dipped his quill into the vial of ink and began to write. The deep furrows on his brow indicated that the oracle was not a pleasant message from the gods. Karamos looked toward the blackened sky as he wrote. Lightning struck a tall cypress tree behind the colonnade as Karamos began to speak. Apollo brings rain on the earth and sunshine on our fields. Wars will continue and many of your sons will die. Their blood will be an offering to Apollo. Your fields will be fertile and many more sons will be born to the women of Sparta.

The Delphic Oracle Tradition

The Delphic oracle did not encourage innovations in religious or political matters. Delphic priests and consultants were advised to follow the religious and political custom of their particular state (Dempsey, 1918). Socrates reflected this opinion when he said, "The augur should be under the authority of the general, and not the general under the authority of the augur," (Plato, trans. 1957). Apollo's priestess, Pythia would fall into a trance brought on by inhaling a mixture of bay leaves, hemp and other native plants and utter ambiguous and sometimes incoherent messages from the gods (Hallam, 1996). Pythia was considered by the Greeks to be the bearer of light. A temple was erected to her in the Athens harbor. She would come out at dusk when there was a full moon exquisitely attired to lead the dances of the muses and graces (Hallam,1996). Bowra (1957) noted that the rituals associated with Pythia illustrate the Greek talent for keeping age-old rites and making sense of them. Even though the Greeks showed outward respect

for Pythia, they depended on the priest who had been well informed on public affairs to deliver a coherent and knowledgeable statement.

The Delphic Oracle in a Modern Context

The Delphi Technique is a modern day medium for exchanging expert opinion. Modern researchers would be well advised to follow the conventional wisdom in their fields of inquiry when interpreting Delphi studies just as the ancient Delphi priests and consultants were admonished to do. Administrators in educational settings when dealing with human subjects should take great care to avoid sacrificing tried and proven principles and practices for new trends. Jones (1980) cautions researchers of the potential of Delphi studies to offer self-fulfilling and self-defeating prophecies.

Delphi Method: History & Overview

Brace yourself like a man and I will question you and you shall answer me.
Job 40:7 (New Revised Standard Version)

Since the beginning of time, humans have sought expert wisdom in answer to life's probing questions. Perhaps the oldest record that we have of dialectic debate is the ancient book of Job. Job's three friends, who were thought to be the expert sages of the earth, came to explain the truths of God's justice and sovereignty to Job during a time of personal crisis. As the debate continued, tempers flared, arguments became heated, personal insults were hurled and neither side considered compromise. At one point, Job sarcastically addressed the experts, "No doubt you are the people, and wisdom will die with you." (Job 12:2). Eventually, both parties recognized the need to call in another expert to moderate the debate. The Expert was summonsed and the debate continued with a clearer, more direct focus, consensus was reached, and everyone parted as friends.

The Apostle Paul recounted the details of his visit to Athens and described his debates with the Jews and the Greek Stoic and Epicurean philosophers in the Areopagus. Paul remarked, “Now all the Athenians and foreigners living there spend their time doing nothing but telling or hearing something new.” (Acts 17:21)

Throughout history, humankind has debated the issues of the day. Plato, Aristotle and Socrates debated religion, politics, ethics, the law, government, astronomy, and science. Socrates believed in the superiority of dialogue over writing. Socratic logic emphasized rational argument and the quest for general definitions (Blackburn, 1994).

Modern discourses of a scholarly nature can not always occur at one time in a public forum because of time constraints, distance and the diverse nature of the issues. Techniques such as focus groups and the Delphi Technique are used to accomplish the same means; to present rational arguments, and to reach consensus on general definitions, common needs, and futuristic trends.

Delphi logic has its roots in ancient Greek dialectical debate. Ziniewicz (1996) discusses the possibility for individuals to discuss opinions, presuppositions, prejudices and predispositions in a dialectical forum. Participants in dialectical debates have the opportunity to investigate, interrogate and weigh approaches, and encourage growth and self-correction. Dialectic debates lessen the possibility of either blind loyalty or error.

Plato, Aristotle, and Socrates all engaged in dialectical oratorical debates. These debates were the ancient equivalent of modern-day focus groups. The philosophers, acting as facilitators would pose a question. The question and answer process that followed allowed everyone to debate the issue. Each person’s ideas were equally valued. Plato used these question and answer techniques to arrive at truth. Aristotle employed a

process of logic in the rhetorical debate sequence to reach truth. Socrates used syllogisms to arrive at general definitions.

Kennedy (1991) recognized that one of the great strengths of the rhetoric of Aristotle is a technique or tool that may be applied to any subject from the universality and utility of its basic, systematically organized concepts. Rhetorical debate provides a system for criticism as well as the exchange of ideas and includes a process for evaluating any form of discourse (Aristotle, trans. 1991).

The German philosopher, Hegel was one of the pioneers of written dialectical debate. Hegel believed that ideas evolved when a concept gives rise to its opposite and a third view, or synthesis arises (Blackburn, 1994). The Delphi Technique, much like Hegalian debates is a technique that encourages the presentation of diverse opinions and a synthesis of these views by reaching consensus in the final round. Hegel argued that the process of self-development resulted from the conflict of opposites. The Hegalalian process of thesis (idea formation) is incomplete and reveals an antithesis (opposition) or a conflicting idea. Synthesis (consensus) is reached when the first two processes are developed in the process of dialectical reasoning (Blackburn, 1994).

One of the earliest uses of the Delphi Technique in the United States was by Frederick Cyphert in the1930's at Ohio State University to develop criteria for evaluating the faculty at Ohio State (Fortune, personal communication, June 2, 1999). The Delphi Technique has not been widely used by educators until recently because it is both time and labor intensive (Weingand, 1998). The time required to distribute and collect mail questionnaires and for analyzing and tabulating responses has detoured educators from

using this method. Electronic mail and computer analysis software make the Delphi Technique more useful to modern researchers.

The most notable use of the Delphi Technique was the RAND corporation study conducted by Norman Dalkey and Olaf Helmer-Hirschberg in 1963 to assess the direction of scientific breakthroughs, population control, automation, space progress, war prevention, and weapons systems (Jones, 1980). Many similar studies were patterned after the RAND study and used by the Department of Defense and other government agencies, factories, businesses, and health care agencies for the purpose of forecasting future trends and as a planning tool.

Researchers at the RAND Corporation in the 1960's jokingly referred to the research of Norman Dalkey and Olaf Helmer-Hirschberg as Delphi research (Turoff and Hiltz, 1996). They applied this label because of the anonymous manner in which Dalkey and Helmer-Hirschberg contacted nuclear science experts to gain information about future nuclear science trends and the forecasts that resulted from these queries.

The Delphic aura created by the anonymity and distance of the panelists continues as both a blessing and a curse for researchers. Proponents of the Delphi Method agree that researchers can obtain more accurate data using questionnaires distributed to a group of anonymous experts at a distance than in face-to-face committee meetings where certain individuals tend to dominate the decision making process (Linstone & Turoff, 1975; Delbecq, 1975; Moore, 1987).

Critics of the Delphi Method insist that the absence of social-emotional support makes the process too mechanical, non-motivating and more disliked than liked among the respondents (Van de Ven, 1974). The Delphi Method is laden with many

misconceptions as noted by Turoff & Hiltz (1996) in their review of the literature. Some of the following misconceptions noted by Turoff & Hiltz (1996) were: (a) It is a method for predicting future events and for generating a quick consensus by a group; (b) it is the use of an anonymous survey to collect information; (c) it is a method for quantifying group judgment. While these statements are partially true, they are often oversimplified or taken out of context by Delphi researchers. For example, Turoff & Hiltz (1996) concluded that reaching consensus is actually contrary to the purpose of a Delphi. The Delphi Method is a communication structure aimed at producing a detailed critical examination and discussion. The purpose of a Delphi study should never be to force a quick compromise or to implement policies based solely on the results of Delphi findings.

Delphi Method in Educational Settings (Pythia's Sources)

Despite the controversial nature of Delphi studies, they have been useful in educational settings in forming guidelines, standards and in predicting trends. Rosenbaum (1991) observed that 80 doctoral research studies employed variations of the Delphi Technique during a five-year period from 1985 to 1989. Fifty-four of these studies were in educational research.

Judd (1972) lists five major uses of Delphi Techniques in higher education: (a) cost- effectiveness; (b) cost-benefit analysis; (c) curriculum and campus planning; college,(d) university-wide educational goals and objectives; and (e) generalized futuristic educational goals and objectives. These uses continue to be served using the Delphi Method.

Lewis (1984) found that most of the Delphi studies in higher education were used to solve problems. In commenting on the likelihood that a Delphi study will have a strong

impact in higher education, Lewis (1984) stated the following conditions: a solution to a recognized problem is actively being sought; the persons who will be affected and whose cooperation is needed are involved with the Delphi study; and the persons who conduct the Delphi are able to act upon the results.

Zargari, Campbell & Savage (1999), Polanin (1990), and Scheele (1975) all insist on the importance of including the stakeholders in the Delphi study to insure that the study will be implemented or will have the desired impact. The stakeholders would recognize the relevance of the problem and would be equipped to act on the results.

Elements for Interpreting the Delphi in an Educational Setting

The following elements should be included when applying the guidelines suggested by the Delphi Study in an academic library setting. These items are included in the Mirrored Research Concept Framework (Appendix A).

1. Campus Environment. Acceptance of individuals with disabilities and a willingness to provide for their needs should be a campus-wide endeavor. Cooperative efforts with the services for disabilities staff, administrators, instructional design specialists, assistive technologists, library staff and individuals with disabilities are essential when planning and implementing guidelines and AT services. Cooperative efforts assure maximization of funding and greater efficiency of service.
2. Consensus. Consensus is reached after several rounds in a Delphi study using measures of central tendency. The mode gives the most accurate picture of the views that have been expressed by the experts. The mean can give a false consensus because it takes in the views expressed by the extreme outliers.

Delphi consensus should be weighed against existing campus policy, instructional design principles and the campus environment.

3. Delphi Study. This technique brings a panel of experts from an individual discipline or a diverse group together to discuss issues, future trends or to suggest problem-solving strategies using an anonymous mail or electronic mail questionnaire.
4. Focus Groups or Survey Data. User services data from individuals with disabilities will provide another useful check for Delphi findings.
5. Institutional Research. Institutional research provides another check for verifying Delphi findings in a campus environment. Campus demographics, statistics, user surveys, and other institutional reports should be considered when interpreting the findings of the Delphi study.
6. Instructional Design Principles. Guidelines that are carefully constructed using accepted instructional design principles help to confirm a seamless transition within an educational setting.
7. Prior Research. The Delphi findings should be checked for congruency with prior research. The researcher should be prepared to explain incongruencies between the Delphi study and scholarly literature sources.

Expert Opinion

Helmer-Hirschberg (1966) stated that the Delphi is applicable whenever policies and plans have to be based on informed judgment, and thus to some extent to any decision-making process (p. 1). However, in formulating policies and plans based on expert opinion, it is important to recognize the fallacies inherent in human judgment. In

1928, Hoover predicted that prosperity was ahead with his “A Chicken for Every Pot” advertisements. Captain Edward Smith confidently assured an audience of the seaworthiness of the Titanic in 1906 with the words, “I cannot imagine any condition which would cause a ship to founder” as cited in (Bennett, 1961, p. 144). P.A.S. Franklin, Vice President of the International Mercantile Marine Company insisted “the Titanic is well able to withstand almost any exterior damage and could keep afloat indefinitely after being struck.” Franklin was not aware that the Titanic and 1,533 of her passengers were already more than two miles under the surface of the sea (Cerf & Navasky, 1998). Admiral William Daniel Leahy advised President Truman of the impracticality of using the atomic bomb in 1945. “The bomb will never go off, and I speak as an expert in explosives.” (Leahy, 1955)

On January 27, 1986, engineers at the Morton Thiokol Company that manufactured the Challenger warned Lawrence Mulloy, NASA’s Solid Rocket Booster Project Director, that cold temperatures might prevent the boosters’ O-rings from performing safely. Joe Kilminster, Vice President of the Space Booster Program responded, “If the primary seal does not seat, the secondary seal will seat” and recommended that the launch should not be postponed (Vaughn, p. 311).

Expert advice from health experts has been equally suspect on a number of occasions. The Brown & Williamson Archives contain numerous cigarette advertisements indicating the benefits of cigarette smoking by medical professionals. Doctors proclaimed the benefits of cigarette smoking for nose, throat and lung disorders from the 1930’s to the 1950’s. Deeply inhaling menthol cigarettes was thought to cure or to at least lessen the effects of asthma, tuberculosis and other lung problems. Cigarette

companies often used doctors in their advertisements with slogans like, “More doctors smoke Camels than any other cigarette” (Camel, 1946-47) and “Physicians say Luckies are your throat protection against irritation and cough” (Luckies, 1930). Lucky Strikes claimed that this advertisement in the 1930’s was based on the research of 20,878 physicians. Philip Morris claimed in 1936 that a group of doctors had proved conclusively that patients who switched to their cigarettes no longer had signs of throat irritation and were definitely improved. In 1941, Philip Morris claimed that eminent medical authorities recognized the benefits of their product for the nose and throat. In 1948, Philip Morris stated, “leading nose and throat specialists suggest Philip Morris.” Riviera cigarettes were marketed as a cure for bronchial and asthmatic disorders. In the 1950’s they advertised their cigarettes with soothing medicated menthol without the taste of medicine. Dr. Max Cutler, a cancer surgeon was quoted as saying “the blanket statements appearing in the press that there is a direct and causative relation between smoking of cigarettes and cancer of the lung is an absolutely unwarranted conclusion” (New York Times, April 14, 1954). In this same article, Dr. Heuper at the National Cancer Institute stated “If excessive smoking actually plays a role in the production of lung cancer, it seems to be a minor one.” Cigarette smoking was recommended for college students in the 1970’s based on a study that indicated that cigarette smoking increased the amount and intensity of brain wave alpha rhythms (Brotege & Kennedy, 1974). Viceroy (1939-1949) solicited the expert opinion of dentists to boost sales. The number of dentists recommending smoking Viceroys for tooth protection increased annually. In 1945, 5,520 dentists recommended smoking Viceroys. By 1949 the number

of dentists recommending this pearly white protection had increased to 39,462. (Brown & Williamson Archives)

The Delphi Technique & Expert Opinion

Despite the fallacies inherent in seeking advice from the experts, the Delphi Technique can provide important insights from a panel of expert educators when developing standards, guidelines and determining future trends. In the context of special services in academic libraries, determining the issues and developing corresponding guidelines will be a helpful preliminary step for special services librarians.

Guidelines for Using the Delphi Method

Linstone and Turoff (1975) have identified criteria that can be used to determine when the Delphi Technique should be used. The following are criteria that they have identified which are applicable to this study:

1.) A problem does not lend itself to precise analytical techniques but can benefit from subjective collective judgments,

2.) The individuals needed to contribute to the examination of a broad or complex problem have no history of adequate communication and may represent diverse backgrounds with respect to expertise or experience.

3.) The heterogeneity of the participants must be preserved to assure validity of the results.

Purpose and Objectives

Socrates described himself as a gadfly "appointed to this city as though it were a large horse which because of its great size is inclined to be lazy and needs the stimulation of a stinging fly" (Plato, trans. 1957). The Delphi Technique can serve a similar purpose

in education. Educators can uncover and discuss issues and problems in an anonymous forum that would not otherwise be brought to the forefront. The purpose of this study was to identify the substantive issues and critical problems with incorporating AT in academic libraries and to develop corresponding guidelines to address these issues. The review of the literature indicated that there are no guidelines for implementing or evaluating AT services in academic libraries. The following objectives were achieved using the Delphi Technique: (a) Providing exploratory AT research; (b) providing a conceptual framework for evaluating AT services; (c) providing professionals with a forum for achieving consensus on issues and problems in services for students with disabilities and AT in academic libraries; (d) providing follow-up data for AT, library special services and the Delphi process in educational research.

The following section discusses the appropriateness of the Delphi Technique for achieving these purposes and objectives.

The Delphi Technique

"The Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem." (Linstone & Turoff, 1975, p.3) One of the objectives of a Delphi inquiry is to obtain a consensus of opinion from a group of respondents utilizing written responses instead of bringing individuals together (Delbecq et al., 1975; Rojewski & Meers, 1991).

The conventional Delphi study begins with the selection of the Delphi panel. The panel members were asked to respond to a query in the first round soliciting their perceptions regarding a particular issue (Tanner & Stone, 1998). Andranovich (1995)

emphasizes that the purpose of the Delphi must be clear so that the initial question can be developed. The Delphi question must elicit the information that is desired from the panelistis. Delbecq (1975) suggests focusing the Delphi question using the following three probes. Why are you interested in this particular Delphi? What do you need to know that you do not know now? How will results from the Delphi influence decision making once the procedure is completed?

The first Delphi probe in this study asked the panel to identify exhaustively the substantive issues and critical problems with using AT in academic libraries and to suggest guidelines for addressing these issues and problems. This probe addresses Andranovich's three guidelines for focusing the Delphi probe question. The second step in the Delphi process is determining who should participate as a Delphi panelist (Andranovich, 1995; and Stewart & Shamdasami, 1980; Turoff & Linstone, 1996). The Delphi moderator determined who should participate in the study and was responsible for scoring and interpreting the results. The moderator had a pre-determined set of panelist qualifications and determined the number of panelists. The panelists for this study were individuals who were academic librarians, postsecondary assistive technologists or services for students with disabilities providers. The panelists were selected based on professional publications related to AT or services for students with disabilities in academic library settings.

The purpose of the third round of the Delphi was to reach consensus. The panelists were given feedback from the second round. Panelists who expressed different views from the group were asked to provide reasons for their responses in the third round. The panelists were asked to do another ranking of the items that received the highest

number of positive responses in the second round. Consensus was reached after three rounds as the study was saturated by that point (Linstone & Turoff, 1996; Moore,1987).

Typically, Delphi studies that are conducted in an educational setting include three rounds. The purpose of the first round is to form issues and to determine initial positions on the issues. The second round provides the panelists with feedback from the first round and presents a questionnaire to the panelists. The panelists rate the items on the questionnaire using a predetermined scale. The Delphi moderator uses measures of central tendency to determine consensus on the results from the second round. Individuals are asked in the third round, to reevaluate their opinions when they differ from other panelists. The purposes of the third round are to provide feedback from the previous round and to reach a final consensus.

Measures of central tendency were used to present and to determine the consensus. Individuals who express views that are significantly different from other panelists are asked to provide reasons for their dissenting views.

Comparisons were made between the guidelines that the panelists agreed to and guidelines that may be implied from the literature. The purpose of this comparison was to triangulate expert opinion in this study with the literature. Lincoln & Guba (1994) emphasize the importance of triangulating qualitative research using the constructs or canons of credibility, transferability, dependability and confirmability. The mirrored research conceptual framework (see Appendix A), is a framework that reflects the importance of previous research in interpreting a Delphi study and views the findings of the Delphi in light of accepted instructional design principles, campus environment and respects the views of non-experts who will be involved in the decision-making process.

Research Design

The Delphi Technique is useful for exploratory research and planning as indicated by Linstone & Turoff (1995), Moore (1987) and Van de Ven & Gustafson (1975). The Delphi Technique provides a useful means for exploring and describing current issues and problems with using AT in academic libraries. The Delphi Technique is equally useful for developmental research. The Delphi questionnaire will be used to solicit guidelines from academic librarians and assistive technologists for serving individuals with disabilities and evaluating AT services.

Isaac and Michael (1997) indicate that the purpose of developmental research is to ask questions about the patterns, direction, and sequence of growth or change and to explore the interrelated factors affecting these characteristics. Turoff (1996) states that the heart of the Delphi is the structure that relates all the contributions made by the panelists and produces a group view or perspective.

Using the modal score may in some cases yield bimodal or trimodal responses in the first round. If some items continue to be bimodal after the third round, then the indication is that consensus could not be achieved on these items (Stag, 1983).

Cyphert & Gant (1970) describe the advantage of using the modal score as being that “prospective participants must be made to feel that their response is valid so that they will take part” (p. 273). They insist as does Stag (1983) that using the mode rather than the interquartile range gives the panel member a greater affiliation with the study. Showing a mean score does not give an accurate view of the individual panelists’ ratings.

The consensus for each round was computed with a comparison made for each respondent. Respondents were notified of their modal responses for each question.

Research Procedures

Andranovich (1995) outlines three preliminary steps to use when conducting a Delphi. First, the purpose of the Delphi must be clear so that the initial question can be developed. The Delphi question must elicit the information that is desired from the panelistis. Delbecq, et al (1975) suggests focusing the Delphi question using the following three probes. Why are you interested in this particular Delphi? What do you need to know that you do not know now? How will results from the Delphi influence decision making once the procedure is completed?

The first Delphi probe in this study mentioned the need for providing individuals with disabilities equal access to academic library services and asked the panel to identify exhaustively the substantive issues and critical problems with using AT in academic libraries and to suggest corresponding guidelines for addressing these issues and problems. This probe addressed Andranovich's three guidelines for focusing the Delphi probe question. The literature does not contain a sufficient base for researching issues and problems or guidelines for using AT in academic libraries. The results may be used by academic librarians along with other research to provide a basis for establishing standards and evaluating AT services.

The second step that Andranovich (1995) recommends is determining who should participate as a Delphi panelist. The moderator should have a pre-determined set of panelist qualifications. Third, the moderator determines how many panelists will participate. The panelists for this study were academic librarians, postsecondary assistive technologists and disability services providers.

After the panelists had been selected, the facilitator contacted the list of potential panelists and discussed the Delphi, its expected outcomes and uses and requested the panelists' commitment to participate in the study. In the first round, each panelist received a copy of the Delphi question and instructions on how to respond to the question and where to send the responses. The responses were clustered into categories following round one (Andranovich, 1995). A master list of responses was created and used for developing the questionnaire for Round two from this list. The Round Two questionnaire included a scale for ranking items and indicated the level of consensus.

The Round Two questionnaire was distributed to the panelists including feedback from the first round and instructions for responding to the second questionnaire. The panelists ranked the items listed on the questionnaire and added new items. The responses were tallied from Round Two and the ranking of these items became the basis for the third round.

The purpose of the third round of the Delphi was to reach consensus. The panelists were given feedback from the second round. Panelists who expressed significantly different views from the group were asked to provide reasons for their responses in the third round. The panelists were asked to do a second ranking of the items that received the highest number of positive responses in the second round. Consensus on all items was not reached after three rounds. However, the data was thoroughly saturated by the third round (Linstone & Turoff, 1996; Moore, 1987).

Typically, Delphi studies that are conducted in an educational setting include three rounds. The purpose of the first round was to form issues and determine initial positions on the issues. The second round provided the panelists with feedback from the

first round and presented a questionnaire to the panelists. The panelists rated the items on the questionnaire using a predetermined scale. The Delphi moderator used measures of central tendency to determine consensus from the second round. Individuals were asked in the third round, to reevaluate their opinions when they differed significantly from the other panelists. The purposes of the third round were to provide feedback from the previous round and to reach a final consensus.

Measures of central tendency were used to present and determine the consensus. Individuals who expressed different views from other panelists were asked to provide reasons for their dissenting views.

Outcomes

The outcome of the study was that library special services issues and problems were identified along with possible solutions for addressing them. The results of this study will provide a useful set of guidelines when used in conjunction with the literature on postsecondary disability services, institutional research and the suggestions of individuals with disabilities. Ultimately, the most highly esteemed expert opinion should be the opinion that is expressed by postsecondary individuals with disabilities who will be using AT. Their perspective was not included in this inquiry. A follow up study in which students with disabilities are interviewed would serve as a helpful means for validating the results of this study.

Comparisons were made between the guidelines that the panelists agreed to and guidelines that may be applied from the literature. The purpose of this comparison was to triangulate expert opinion in this study with the literature. Lincoln & Guba (1985) emphasize the importance of triangulating qualitative research using the constructs or

canons of credibility, transferability, dependability and confirmability. Ascher & Overholt (1981) express the need for a synthesis of expert and practitioners opinions in the planning process.

Stewart & Shamdasami (1980) outline the steps in the Delphi process:

1.) Develop the initial Delphi probe or question;

1.) Select the expert panel;

2.) Distribute the first round questionnaire;

3.) Collect and analyze Round One responses;

4.) Provide feedback from Round One responses, formulate the second questionnaire based on Round One responses and distribute;

5.) Repeat Steps 4 and 5 to form the questionnaire for Round Three;

6.) Analyze final results;

8.) Distribute results to panelists.

Turoff (1975) provides a detailed explanation of the phases in the Delphi process:

1.) Formulation of the issues: What is the issue that really should be under consideration? How should it be stated?

2.) Exposing the options: Given the issues, what are the policy options available?

3.) Determining initial positions on the issues: Which are the issues everyone agrees on and which are the unimportant ones to be discarded: Which are the ones exhibiting disagreement among respondents?

4.) Exploring and obtaining the reasons for disagreements: What individual underlying assumptions, views, or facts are being used to support the panelists' respective positions?

5.) Evaluating the underlying reasons: How does the group view the separate arguments used to defend various positions, and how do they compare to one another on a relative basis?

6.) Reevaluating options: Reevaluation is based on the views of the underlying evidence and the assessment of its relevance to each position. (p.88)

Panel Selection

Patton (1990) recommends including key experts in a subject field to solicit the latest thinking and to inform policy-making. He recommends synthesizing expert opinion with existing opinion to pull together a research base for policy making.

An expert panel of postsecondary assistive technologists, academic librarians and disability service providers were selected in order to identify issues and problems with library special services and to suggest guidelines for addressing these issues. Scheele (1975) defines experts as those who have relevant experience. Knowledgeable library experts who have demonstrated their commitment to the area of special services through publications or relevant experience were selected to participate in this study to develop AT guidelines for academic libraries. The criteria used in selecting the panelists were based on their history of involvement in national and state professional AT and library organizations and their history of publishing information in these areas. The following categories were included: (1.) college librarians; (2.) postsecondary service providers for students with disabilities; (3.) authors of materials on postsecondary disability services or AT; (4.) assistive technologists.

The Letter

A letter was sent to each potential panelist. (Appendix C) The purposes of the letter were to introduce the moderator and to request participation of Delphi panelists. The letter informed the potential panelist of the nature of the study, the procedures to be followed and the benefits to be gained from the outcomes of the study. The letter guaranteed anonymity and described how the panelist was to be informed of the results.

Respondent Anonymity

One of the characteristics of the Delphi Method is the anonymity of the panelists. Dalkey (1975) insisted that stakeholders must retain anonymity from each other and must remain anonymous in reporting the results. Turoff & Hiltz (1996) state the reasons for anonymity in the context of the Delphi.

1.) Individuals should not have to commit themselves to initial expressions of an idea that may not turn out to be suitable.
2.) If an idea turns out to be unsuitable, no one loses face.
3.) Persons of high status are reluctant to produce questionable ideas.
4.) Committing one's name to a concept makes it harder to reject.
5.) Consideration of an idea may be biased by the person who introduced it.
6.) When ideas are introduced within a group where severe conflicts exist the consideration of an idea may be biased by knowing it is produced by someone with whom the individual agrees or disagrees.
7.) The high social status of an individual contributor may influence others in the group to accept the given concept or idea. Conversely, lower status individuals may not introduce ideas; for fear that the idea will be rejected.

The main objective of anonymity is to allow the introduction and evaluation of ideas by removing common biases that occur in face-to-face communication. Delphi panelists are more motivated to respond to questionnaires if they feel that their ideas will be valued and that they can place equal value on the contributions of other panelists.

Delphic Probe

The first Delphi asked the panel to identify exhaustively the critical problems and substantive issues in providing AT in academic libraries and to develop corresponding guidelines for these issues and problems. The second Delphi was designed to prioritize the identified issues and problems and to begin the consensus process. The third Delphi sought to improve the level of consensus and to establish priorities among the items that had been listed. Consensus on the prioritized critical issues and problems was determined by computing the modal scores for each of the identified items using a four-point Likert-type scale. Cyphert & Gant (1970) and Turoff & Linstone (1975) recommended using the mode as the most accurate manner for reporting consensus. Similiarly, Stag (1983) commented that the mode is frequently used in efforts to gain opinions. Scheibe, Skutsch & Schoffer (1975) indicate that the modal response shows the stability of the group response. The mode shows the responses that occur most often within each category. The mean can give a false consensus because of the effect of extreme outliers on this measure.

The Questionnaire

As Bradburn & Sudman (1979) indicated, one of the best courses for reducing interviewer or facilitator effects on data is to write better questions. A critical step in

writing better questions is careful, thorough development and pretesting procedures (Fowler & Mangione, 1990).

Isaac & Michael (1997) state that "a question well stated is a question half answered" (p. 36). At the exploratory stages of research, finding out which questions to ask is a major goal (Fowler & Mangione, 1990). Since the study will incorporate experts from several different areas, it will be important to minimize confusion by explaining the professional jargon that panelists use.

One of the purposes of the initial Delphi probe is to inform the panelists of the purposes of the items that will be included on the questionnaire. While the initial probe should be informative, it should be broad enough that it does not inhibit responses. The initial question should encourage exhaustive responses from the panelists. Cox (1996) indicates that the purpose of the initial questions should be to frame or to establish a context for the instrument. A continuous focus on these questions will help the researcher to avoid unclear or extraneous items.

Scale Development

Cox (1996) recommends using a scale with an even number of points so that the respondent cannot circle a number in the middle and is forced to choose one side or the other. This is particularly important in designing a scale for a Delphi study because mid-range responses can lead to a false consensus. Additionally, even numbered scales can be more easily collapsed into fewer categories (Cox, 1996). Spector (1992) states that in order to develop a scale, a definition must be adopted. An importance scale was used to accomplish the task of prioritizing items that will be included on Round 2 and 3

questionnaires as suggested by Moore (1987). The definitions for the items on the importance scale are as follows:

1.) Important- Critical or urgent problem or issue; first order priority; has direct bearing on AT services in libraries; must be resolved or dealt with in order to provide adequate AT services.
2.) Relevant Problem- second-order priority; of considerable significance, requires attention in conjunction with other problems.
3.) Insignificantly Relevant Problem- Third-order priority; has little importance; not a correlate of a major problem; does not have to resolved at this time.
4.) No relevance- No priority; no measurable effect; item should be dropped.

Data Collection & Management

This study, using the Delphi Method, will involve a series of three rounds, each of which will require the panelist to identify, clarify, and redefine specific areas relating to AT services in academic libraries.

Each panelist was contacted by email and asked to participate in the study. The email letter introduced the moderator and gave details of the study. The letter described the initial Delphi probe and the intended uses of the results of the study. In addition to providing the panelists with an overview of the study, the letter will give a timeline for the project. A questionnaire including the initial Delphi probe was included with this initial correspondence. The panelists will indicated their willingness to participate by submitting their list of issues, problems and guidelines for Round One.

Statements were tallied and arranged into categories by the moderator after receiving the Round One results. The moderator gave the panelists feedback on the

Round One responses and developed a questionnaire based on the Round One responses for Round Two.

The panelists voted on the items included on the Round Two questionnaire using the importance scale and will be given the opportunity to suggest additional items. The moderator provided feedback to the panelists for the results from Round Two and will develop the third questionnaire based on these responses. Fink, Kosecoff, Chassin and Brook (1984) considered the results of a Delphi study to be complete when there is a convergence of opinion or when a point of diminishing returns is reached.

Data Processing & Analysis

Palomba & Banta (1999) insist that assessment is more than a collection of data. They emphasize the importance of using assessment results to improve educational programs. Wainwright & Dean (1976) assert, "no single technique may be regarded as adequate for complete evaluation purposes, nor does the whole range of techniques available provide any certainty of arriving at measures of collection adequacy which may be irrefutable"(p. 82). Issac & Michael (1997) suggest that a study must be confirmed by two or more independent measurement processes in order to reduce the uncertainty of its interpretation. Webb, Campbell, Schwartz, & Sechrest (1966) state that "the triangulation process is far more powerful evidence supporting a proposition than any single approach" (p. 93). Morgan (1995) also recommends that a wide variety of techniques should be deployed including questionnaires, checklists, interviews and simulations in the data processing and assessment process in order to give a rich picture approach. Rossman & Wilson (1985) discuss the richness that is brought to research

when data from different sources are used to corroborate, elaborate or illuminate the research (p.144).

Palomba & Banta (1999) state, “of all the important factors in creating a successful assessment program, none matters more than widespread involvement of those who are affected by it” (p.53). Creswell (1998) agrees that verification especially from different frames of reference helps to underscore the legitimacy of results in qualitative research. Jones (1980) notes that experts often do not have time to pursue issues outside of their disciplines. For this reason, it is difficult to form a holistic picture using the tunnel vision of a pool of experts. Linstone & Turoff (1975) stress that the Delphi does not substitute for staff studies, committee deliberations or other decision-making forums. “Rather, it organizes and clarifies views in an anonymous way, thereby facilitating and complementing the committee’s work” (p.75).

Morgan (1995) recommends a participatory management approach when implementing new library goals in order to build a relationship of trust with employees. Such a participatory management approach is recommended in the Mirrored Research Conceptual Framework. (Appendix A) Abbott (1994) suggests that the development of library plans should not be isolated from the normal management process, not should it be developed by one person. Seelman (1999) stresses the importance of making use of all available data in the planning process. The moderator analyzed the results from the final round and provided feedback to the panelists using the modal scores in this study. Responses were arranged in categories with suggested guidelines addressing AT issues and problems. The panelists were sent copies of the final results and were asked to provide feedback. No feedback was given regarding the final results.

Limitations (Pythia's Disabilities)

Armstrong (1985) states that evidence in favor of experts in Delphi studies is lacking. Jones (1980) insisted that a theory should be explicit and consistent, and that a Delphi study is constructed by piecing together a sometimes incompatible set of opinions. Sackman (1976), Welty (1974), and Dobbert and Kurth-Schai (1980) all refer to studies in which similar results were obtained with students that had been obtained from the experts. It is possible that the panel of experts may not reach a consensus on some issues, thus providing only fragmented information (Combs, 1985). Lawrence (1980) noted that developmental research may not always be reliable because of poor sampling procedures or an invalid instrument and could be detrimental in the decision-making process when used in isolation from other methods.

Gordon & Helmer-Hirschberg (1966) acknowledged some of the following weaknesses in the Delphi Method that could be applicable to this study: Instability of panel membership (high drop out rates) and respondents' competence to answer questions outside their specialized fields.

Fink, Kosecoff, Chassin, and Brook (1984) noted that the Delphi Technique sometimes produces the lowest common denominator of agreement. Rennie (1981), likewise, lamented that the Delphi provides bland generalities representing the lowest common denominator of debate.

The experts are qualified to discuss AT, however, they may not represent the most articulate policy-makers in their respective fields. Some of the panelists' suggestions reflect a reliance on budgetary resources that are not available in some settings. Anonymity is one of the characteristics of the Delphi Technique. This characteristic can

detract from the credibility of the study and can make the experts inaccessible to future researchers and practitioners.

Linstone (1975) cautioned against the following pitfalls involved with using and interpreting the Delphi Technique that are applicable to this study:

1.) The Simplification Urge. Simplistic misjudgments can easily result from the basic statements that are inferred from a Delphi study.

2.) Illusory Expertise. The specialist is not necessarily the most knowledgeable person. Sometimes experts lack the ability to see the global picture thus, thwarting their ability to produce effective organizational decisions.

3.) Sloppy Execution. Superficial analysis of responses is a most common weakness. Hasty or incomplete answers can give the moderator an inadequate or inaccurate picture.

4.) Overselling. Linstone cautions against the pitfalls of inbreeding (repeating Delphi studies on the same subject, using the same experts and anonymity). Anonymity may be a disadvantage in that the source of a statement may be far more significant than its substance. "Consensus of several participants may be of less value than knowledge of their identity (Linstone, 1975, p. 585)."

5.) Deception. The Delphi process is not immune to manipulation or propaganda use. The anonymity in such a situation may even facilitate the deception process (Linstone, 1975, p. 586). Welty (1973) uses the analogy of the Greek myth of Ino, the wife of King Athamus of Orchomenus. When the King dispatched a messenger to the Oracle of Delphi, Ino bribed him to return with

> a falsified story. In a second consultation at Delphi, the Oracle based its pronouncements on the false version of the first utterances.

Gordon & Helmer-Hirschberg (1966) suggest that the facilitator should ensure the following circumstances in order to derive the most reliable results from the Delphi: (a) the panel membership should remain reasonably stable; (b) time lapses between questionnaires should be held to a minimum; (c) questions should be unambiguous; (d) feedback should be provided that gives reasons for consensus opinions and consensus using the mean or average values should be avoided in order to avoid discriminating against outliers.

Summary

The Delphi Method is an iteration of responses on a questionnaire to achieve consensus by a panel of experts (Stag, 1983). This study utilized AT, disability services and library professionals to identify problems and issues and to develop corresponding guidelines for AT services in academic libraries. The issues and problems and guidelines were agreed on through a three round structure of the Delphi Technique. The individuals who were selected for the panel of experts have a history of involvement in national and state professional AT and library organizations or a history of publishing in these areas.

Responses were returned to each panelist as rapidly as possible in order to reduce attrition and to hold the interest of the participants. This study used the modal value to report findings because this is the measure that is most appropriate for a general study of this nature using a small sample of experts. Guidelines selected as important were prioritized according to the modal responses indicated by the participants and placed into categories for easy reference.

The main purposes for using the Delphi Technique for this study was to provide a forum for formulating issues, exposing options, determining initial positions, exploring and obtaining the reasons for disagreements, reevaluating the options and ultimately suggesting useful guidelines for using AT in academic libraries.