WEB ACCESSIBILITY FOR STUDENTS WITH

DISABILITIES WHO USE ASSISTIVE

TECHNOLOGY: A MOVING TARGET

FOR POSTSECONDARY

INSTITUTIONS

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PREFACE

This study was conducted to discover what colleges and universities are doing to facilitate web accessibility for their students with disabilities who use assistive technology access. The study examined four higher education institutions, two regional universities and two two-year colleges from a Southwestern state. The institutions were purposefully chosen based on two criteria: 1) the number and type of distance education courses offered and 2) the number of students with disabilities, such as blindness, deafness, and the ortho/mobility impaired, they have on campus that would use assistive technology to access asynchronous web-based courses. Social systems and policy implementation theories were the theoretical lenses used to analyze the data gleaned from interviews with 23 respondents: two pilot interviews and 19 other interviews, two of which occurred in pairs.

TABLE OF CONTENTS

LIST OF TABLES

Chapter I

Design of the Study

An estimated 500 million people worldwide currently self-disclose as disabled, 54

million of whom reside in the United States (Paciello, 2000). As many as 24 million

Americans over the age of 15 have disabilities that prevent employment (Rowland,

2000). In recent years, the number of disabled Americans, which includes those with

visual, auditory, ambulatory, or vocal impairments, has steadily risen from an estimated

35 million in 1974 (Hauben, 1979-1980) to 42.4 million in the 1990 census (Rothstein,

1998) to 48.9 million in 1996 (Kraus, Stoddard, & Gilmartin, 1996). The United States

Health and Human Services (2004) *Disabilities/Limitations* report notes 33.7 million

people with limited activity due to chronic conditions, 30.8 million with hearing

impairments, and 19.1 million who are visually impaired for a total of 83.6 million

people in 2002. Those numbers increase dramatically with the inclusion of "hidden"

disabilities such as learning disabilities, diabetes, or AIDS (Rothstein, 1998).

As if their affliction were not enough, people with disabilities too often endure the

emotional pain of marginalization, as they have historically been subjected to everything

from covert discrimination to institutionalization to death because of their differences

(Giedosh, 2000). Unlike other groups which have endured prejudicial practices,

disabilities do not discriminate; every human being, regardless of age, race, ethnicity,

geographic location, or socioeconomic status, could become disabled at any moment due to accident or illness.

Until federal legislation first addressed the needs of people with disabilities in the early 1970s, few organized programs existed to lend assistance. Specifically, early rehabilitation legislation benefited World War I veterans, particularly in the area of employment, but it was impossible to make substantive cultural change on such a relatively small scale (Zigler & Muenchow, 1979). Non-veterans fared worse, particularly those who could have benefited from adaptive aids such as sign language interpreters and Braille signage. Other examples of assistive technology, also known as adaptive aids or adaptive technology, include, but are not limited to, Braille printers that translate text from a computer screen into printed Braille text, voice recognition software that allows mobility impaired people to verbally navigate computer applications, screen readers that digitally vocalize text on a computer screen, and alternative navigational technology such as a puff-and-sip mouse.

Rather than consider how goods and services could be rendered useful for the differently-abled, the public instead considered how the physically challenged could adapt to use existing services (Brewer, 1983). Some employment and social accommodations, such as interpreters and curb cuts, were deemed peripheral, inconvenient, and/or not worth the time, money, and effort involved from the able-bodied perspective. To make matters worse, what tangible support the disabled did have in earlier years was often largely unorganized, which left people with disabilities with little to no access to real political power and legislative attention (Marmor, 1983).

Significant legislative progress began with President Nixon's 1973 authorized Section 504 amendment to the Vocation Rehabilitation Act, which prohibits discrimination of people with disabilities by any organization that accepts federal financial assistance, including higher education institutions (Rothstein, 1997a). Nearly two decades later, the Americans with Disabilities Act of 1990 and Section 255 of the Telecommunications Act of 1996 passed with marked legislative attention (Rothstein, 1998), and both prove critical for college students with disabilities. The ADA of 1990 delineates most topics not covered elsewhere in law regarding discrimination of people with disabilities whereas Section 255 requires manufacturers of "telecommunications equipment and broadcasters . . . [to] provide access" for easy use of their electronics products by people with disabilities wherever feasible (Disability Rights Office, 2005; Rothstein, 1997a, p. 18). These combined legislative efforts provide current students with disabilities who are intellectually and academically prepared for college-level work the logistical assistance they need for access to college education.

Legislation has removed many obstacles for students with disabilities, but technological advances have raised others. Common activities such as banking and obtaining information have become faster and more convenient with computer technology. Unfortunately, assistive technology, such as screen readers, which vocalize print on a screen, can have difficulty interfacing with such technological services due to technical incompatibilities between the adaptive aids and the services (Coombs, 1995). While Section 255 of the Telecommunications Act requires accessibility that is readily achievable, it includes a rather vague definition of "readily achievable," which leaves significant room for developers' creative interpretation (Borchert, 1998). Internet access

offers an excellent example. Because Section 255 remains vague, access to modern

conveniences that rely on Internet access, such as online banking, proves challenging for

those who must use assistive technology. Software developers and technology gurus

appear tempted to interpret "readily accessible" to mean the least amount of interference

with product design, so they do the minimum required by law to remain in compliance.

As a result, many who use adaptive aids are left with poor or no access (National Council

on Disability, 2000a).

Unfortunately, college students with disabilities do not escape these technology

hurdles; in fact, some appear insurmountable as colleges and universities embrace

technology as additional means by which they may inexpensively disseminate

information, transmit courses to remote locations, and compete for students at a distance.

Accommodations for college students with disabilities continue to be complicated by the

advanced technology of modern distance education. Prior to 1969 in the United States,

distance education courses were mostly correspondence based (Flottemesch, 2000).

Today students can earn fully accredited degrees online (U. S. Department of Education,

1999).

Studies from the National Center for Education Statistics (U. S. Department of

Education, 1997a; U. S. Department of Education, 1999) reveal that distance education

programs use any number of initiatives from interactive television (I-TV), where students

and an instructor in one location may be seen and heard by a group of students elsewhere

in real time and vice versa, to live web-casts, video streaming, and audio streaming.

Standard Internet courses may also be as interactive as a traditional classroom through

the use of threaded discussions or synchronous chat functions. In reality, the point to

which web-based courses may be enriched through the use of audio and visual web-based materials are limited only by instructors' imaginations (M. Curtis, personal communication, November 27, 2002). Truly, colleges and universities stand at the forefront of a new era in higher education history.

While web-based distance education has successfully provided millions of higher education students with educational opportunities they would not otherwise enjoy, it poses significant challenges for college students with disabilities who rely on assistive technology. The problems for students who rely on such technological wonders are many. Some issues reside with the computers and the adaptive technology itself (Coombs, 1995; Microsoft, 2001). More problems originate in web site design (Lazzaro, 1994; Pattison, 1999; Waddell, 2000). Though initiatives do exist to help remedy disruption in service (Paciello; 2000; Waddell, 2000; Web Accessibility Initiative, 2000), much remains to be done (National Council on Disability, 2000a; Paciello, 2000; Waddell, 2000).

Distance education will remain a major force in higher education's efforts to provide educational opportunities for students independent of location. According to the National Center for Education Statistics (U. S. Department of Education, 2000), all but nine percent of public colleges and universities offer some form of web-based or web-enhanced instruction, and a minimum of 62% of public two-year colleges and 78% of public four-year universities plan to continue offering web-enhanced courses (U. S. Department of Education, 1999). Aside from traditional distance education courses, 59% of instructors require the use of email in their courses, and 30.7% of instructors have a web page for their course, which students are required to visit (Witherspoon, 2001).

While colleges and universities clearly continue to rely more heavily on distance education to deliver instruction, current distance education research fails to note serious attempts to accommodate college students with disabilities in web-based courses. Substantial research regarding issues of access does exist, but most focuses on socioeconomic or geographical issues (Gladieux & Swail, 1999; Koch, 2000; Mollison, 2001). Other research focuses exclusively on access to students with disabilities in public schools, but its coverage of access issues pertinent to college students with disabilities, or the public with disabilities at large for that matter, remains incomplete (Fine, 2001). Finally, there is little evidence in the literature to show that colleges and universities formally prepare course designers for the magnitude of accessibility issues that students with disabilities currently face, which is precisely where some believe fundamental change must begin (National Council on Disability, 2000a).

Two studies, however, merit closer attention. Flottemesch (2000) and Kim-Rupnow, Dowrick, and Burke (2001) argue that distance education provides unparalleled access to higher education for students with disabilities, and these studies focus more precisely than others on the degree to which access issues affect students' learning. Both studies focus on factors that either inhibit or facilitate students' learning in technology rich environments, and both call for further study in virtually every area of disabilities studies and distance learning. Kim-Rupnow, Dowrick, and Burke (2001) go so far as to recognize that "no matter how advanced the available technologies are, how supportive the school personnel is, or how articulate the policies that protect human rights are, there will be no improvement in the individuals who do not take initiative and follow through" (p. 37). Herein lays the problem.

Studies regarding current attempts by colleges and universities to increase access to web-based courses and other web-driven initiatives remain remarkably scarce. Indeed, what little is available describes what can and must be done to facilitate accessibility (Paciello, 2000; Waddell, 1998), but none attempts to study what colleges and universities are actually doing to reach the goal of full accessibility for web-based courses.

<center>*Statement of the Problem*</center>

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 guarantee students with disabilities who are otherwise academically qualified reasonable access to all higher education programs. Additionally, a 1996 U. S. Department of Justice ruling clearly indicates that all accessibility requirements pertinent to ADA apply to web-based activity (Oklahoma ABLE Tech, 2002; Patrick, 1996), and Section 255 of the Telecommunications Act guarantees accessibility to telecommunications technology. Together, these legislative acts ensure unparalleled access to higher education for students with disabilities, particularly those who depend on adaptive technology.

A 1999 survey reveals that more than 1.5 million students enrolled in some form of distance education course (U. S. Department of Education, 1999), numbers that will continue to rise as technology progresses. The critical issue is that the more colleges and universities rely on web-based initiatives, such as web-based distance education and web site dissemination of information, the greater the risk for excluding students with

<center>7</center>

disabilities from electronically delivered education. Judging by recent reports from disabilities advocates, the general consensus seems to be that colleges and universities remain far from compliant in this area (National Council on Disability, 2000a; Paciello, 2000; Waddell, 2000). To further highlight the importance of higher education's timely response to these issues, current students with disabilities who graduate from high school are better academically prepared for college than ever before, and these students, because of their experience with PL 94-142, are more likely to insist on appropriate accommodations in college and formally complain when appropriate accommodations are not granted (Rothstein, 1997b). More importantly, students with disabilities who rely on adaptive technology stand to lose untold opportunities afforded by an education if more concerted efforts to ensure compliance by colleges and universities are not made. The combination of an increase in higher education enrollment by students with disabilities and higher education's unprecedented growth in distance education offerings using web-based instruction creates significant cause for concern.

The mandate to comply coupled with the lack of compliance can best be explained in terms of a knowledge-action conflict. It is possible that those responsible for ensuring web accessibility, such as instructional technology directors or their designees who create and/or manage web-based courses, are not clear about the recent legal policies and compliance guideline initiatives that would guarantee access to web-based courses, in particular, for students with disabilities who use adaptive technology. It is also possible that they know of these things but believe their current practices bring them to an acceptable degree of compliance. The last option is that they disregard the policies and guidelines for reasons yet to be determined.

The purpose of this study was to explore, understand, and describe the thoughts and actions of college and university personnel responsible for web-based course development regarding ADA compliance, particularly as it applies to distance education, adaptive technology, and students with disabilities who depend on it to access their courses. The study sought to determine the degree to which those who design and create distance education courses are aware of accessibility mandates and what, if anything, they do with that knowledge in terms of course design to facilitate access. The issue is both timely and important.

The form of the study is an instrumental case study, described by Creswell (1998) as one which uses a case, a program, event, or example bound by place or time, to illustrate or highlight a particular issue. Creswell calls a study that uses more than one case a collective case study. Because the study uses four school sites, two from two college tiers in the same state, to explore the same issue, it would be fair to say that this study is a collective instrumental case study.

Research Objectives/Questions

The primary objective of this research was to determine how the colleges and universities that are heavily involved in distance education interpret federal mandates and state initiatives to comply with ADA law and the 1996 U. S. Department of Justice ruling as they apply to web-based courses. The study sought to answer the following research

question: What are designers of web-based distance education courses doing to accommodate adaptive technology aids for students with disabilities? To answer this question, the study will explore the following subsets of questions:

1) What are college and university policies regarding compliance initiatives for the 1996 U. S. Department of Justice ruling which says that ADA law applies to Internet activities for higher education institutions?

2) What are colleges and universities doing to make existing web-based courses accessible to students with disabilities who use adaptive technology?

3) What do instructional technology directors think are the most critical organizational/environmental and personnel oriented barriers to compliance?

4) In their estimation, what do instructional technology directors believe are the most promising environmental and personal facilitators toward successful implementation?

5) What does an instructional technology director do? What is the role of a director of instructional technology on a university or college campus? What is the instructional technology director's role as it relates to web-accessibility initiatives?

Orienting Theoretical/Conceptual Framework

Social systems theory seems the most appropriate theoretical framework for this study because it examines individuals as integral elements of organization in the sense that their actions are considered both consciously and subconsciously, to some degree,

influenced by the interplay among personal and environmental elements. Because this study focuses on the degree to which colleges and universities move toward full compliance with mandates that web-based courses be fully accessible for all students with disabilities, it also seems useful to consider policy implementation theory, particularly that found in policy evaluation research (Berman, 1978; Weatherley & Lipsky, 1977) as part of the theoretical framework. Loosely coupled systems theory (Weick, 1976) is used to examine how relationships among groups on campus affect web accessibility initiatives and any existing web accessibility policy on campus. Loosely coupled systems theory is useful as a theoretical lens because it helps illuminate potential personnel assets and personnel barriers to implementation.

Procedures

This section includes the researcher's background and disclaimer and pertinent study details regarding data needs, sources, collection and analysis. It also includes a brief discussion of the significance of the study as it relates to research, practice, and theory. Finally, it summarizes the design of study and previews the remaining chapters.

The Researcher and Origin of the Study

I am currently an associate professor of English and Humanities Department Head at Oklahoma State University-Oklahoma City, a two-year constituent agency of Oklahoma State University in Stillwater, Oklahoma, with an emphasis in technical

programs. Among other responsibilities, I currently teach 12 credit hours each fall and spring semester (six credit hours in the summer) of various levels of English courses, Freshman Composition I, Freshman Composition II, and Technical Writing. I also teach two of these courses, Freshman Composition II and Technical Writing, online. I occasionally teach a Masterpieces of Literature class on campus and online for Oklahoma City University. I have either developed web sites or courses using platforms such as Blackboard for all of these courses.

I have been teaching online since spring 1998. At that time, the only means available for online course delivery was a stand-alone web site, so I created web sites for the purposes of delivering three different courses. The courses were so successful that I thought it would be useful to have web sites available for my computer-mediated composition classes as well. A computer-mediated class is different from a traditional class in that I used the web sites I created for my online courses for all of the handouts for the class, for all of the class activities, and for posting announcements and reminders. The classroom contained 25 computers, a printer, a TV/VCR, two whiteboards, and an overhead projector. Everything except the computers, printer, and extra whiteboard are standard equipment in classrooms at OSU-Oklahoma City. Because I had what was considered a high-tech classroom at the time, I wanted to use the web sites I had created to enhance the classroom experience, facilitate class discussion, and improve students' learning by exposing them to additional material not included in the textbook. That is where I met Jesse Locke, the student who sparked my interest in the topic of students

with disabilities who use assistive technology to access the web.[1] Jesse Locke enrolled in my computer-mediated Freshman Composition II class in spring 1999.

Jesse Locke is blind. He was not blind from birth, but he later went completely blind due a degenerative disease. He was a proficient computer user and used a designated computer in class that had JAWS, a screen reading program, already loaded on it for his use. During the course of the semester, Jesse helped me understand that my web sites, particularly the main page, were inaccessible to him because of the format I had chosen (table). JAWS, and most screen readers, do not function well with tables. During that semester I learned as much from Jesse about accessibility for people with disabilities as I hoped he learned from me about English. I learned that my poor design decisions had the potential to keep him from participation in some parts of the course.

In April 2001, the vice president for academic affairs at OSU-Oklahoma City asked me to investigate issues of web accessibility for students with disabilities, which I did by attending conferences, talking with experts, and conducting independent research. At the time, I served on several committees, such as the institutional assessment committee and the academic technologies committee. I am still an active member of the academic technologies committee, which includes a distance learning policies and procedures subcommittee. The former vice president's goal in giving me this assignment was to learn what I could to create an assessment plan, which included an accessibility component, for OSU-Oklahoma City's online courses, which I did. Since that time, I have made several public presentations on the topic and have become recognized by my peers as knowledgeable on the subject. What this assignment did for me was connect my

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[1] All names and locations in this document have been changed to protect the confidentiality of participants.

personal experience with Jesse and my professional experience as a teacher and department head to create the topic for this study.

In spring 2004 I was appointed to the Web Subcommittee Appointed to the Web-Based Intranet and Internet Information and Applications legislative subcommittee, which is part of the Electronic & Information Technology Task Force. During the 2004 legislative session, the Oklahoma State Legislature passed HB 2197, which requires all state agencies to comply with federal or better web accessibility standards. This is a practice 14 of the nation's states have adopted. The Web-Based Intranet and Internet sub-committee, which is one of four legislative committees established by law, has been charged with creating web accessibility standards that all state agencies, including all higher education institutions, will be required to meet beginning July 1, 2005.

Michael Crotty (1998) describes the process by which a basic theoretical framework is a stage set for more intricate construction and development by the learner that later occurs. Crotty calls the process "scaffolded learning" (1998, p. 1) and notes that the theoretical framework is generally formed by someone else. For example, he claims that our assumptions bear on everything we do in terms of research, and without questioning and acknowledging the assumptions and biases we bring to our work, we cannot be clear about the true nature of our research and its results. Because of this, it is important to acknowledge my extensive personal experience with both distance education and disabilities.

My knowledge of disabilities is personal. I have had rheumatoid arthritis, which is categorized by my rheumatologist as advanced and severe, for almost 15 years. I am 39 years old, and I am intimately familiar with the pain and suffering that people with

disabilities experience though I do not consider myself disabled. Very little prevents me from participating in the things I want to do in society. It is through the wonders of modern medicine that I am able to function with little trouble most of the time. In fact, I would wager only people who know what they are looking for would know anything is different about me unless I told them. The kinds of students I discuss in the study do not fit in this category. They are deaf or hard of hearing, blind or have very low vision, or have ortho/mobility challenges. All of these students need assistive technology to help them access their online education. I felt it was important to disclose to study participants my experience both with distance education and with disabilities. The vast majority of participants were open and responsive in return.

As a developer, instructor, and student of web-based courses, I understood well the design issues inherent in each role. From developers and instructors' perspectives, I understood issues related to course construction, layout, and content delivery. From students' perspectives, I recognized the challenges inherent in course navigation, content access, and communication with peers and instructors. Unless I self-disclosed some portion of my background, research participants could not anticipate the nature or amount of experience I bring to the study. Having said this, I acknowledged the fundamental importance of avoiding theoretical over-determination, any preconceived notions about what I might discover in the study, based on my experience and assumptions about the subject (M. Burlingame, personal communication, September 19, 2001).

Simple data needs included contact information for university personnel, such as instructional technology directors or their designees, campus policy information regarding distance education courses and offerings for Academic Year 2003-2004, and university policy information regarding accommodations for students with disabilities who rely on adaptive technology. Other information needed falls in four broad categories: student demographic information, information regarding campus locations where students with disabilities who use adaptive aids may access the Internet, information regarding distance education course design and construction, and information about how knowledge regarding compliance initiatives is communicated. I used social systems theory and policy implementation theory, as well as loosely coupled systems theory, to analyze the data. Specifically, the concepts of roles, role behavior, multiple role conflict, and subsystems were applied to the data. Additionally, I examined the notions of agencies as barriers, lack of resources, coping mechanisms, and individual success in light of the data. The interview protocol in Appendix A contains a list of questions posed to instructional technology directors or their designees.

Sample. The target population for this study is limited to four purposefully chosen colleges, two community colleges and two regional universities, all from the same state. All colleges report to different institutional boards of regents, but the institutional boards report to one central state regents for higher education. These four colleges were chosen among their peers in each category based on two criteria. First, schools were chosen

based on the percentages of student populations with the following disabilities that are more likely to require assistive technology to access material in an asynchronous web based class: ortho/mobility, deafness, visual, and brain injury. Colleges were also chosen based on the number and variety of distance education courses offered. The state is home to two comprehensive universities, but neither was included in this study for one main reason. The regional and two-year institutions fit the criteria better than the comprehensive institutions on both points of interest.

The sample was determined in two ways. The first determination was made given information regarding disabled student populations gleaned from the state regents' report of students served in all of Southwestern's higher education institutions (SRHE, 2002). The second determination was made after an informal survey of Internet course offerings of all of state colleges and universities for the 2002-2003 academic year using the institutions' online schedule for the same year. Institutions were selected for the study because they present the richest opportunities for web accessibility issues for students with disabilities who may rely on adaptive technology to access web-based courses.

Data Collection

Before data collection could begin in fall 2003, entry negotiation at each institution took place. Letters of entry identifying the purpose of the study and delineating proposed activity on campus should permission be granted were presented to appropriate administrators (see Appendix B). Once approval was granted, I approached instructional technology directors and other campus personnel with a similar letter of entry (see

Appendix D). Formal interviews included those with instructional technology personnel, ADA coordinators, and academic administrators. Formal interviews were conducted with 21 people, 17 individually and 2 in pairs for a total of 19 interview sessions. Consent forms were given to all parties as well (see Appendixes C and E).

All initial interviews were conducted on research campus sites according to the respondents' preferences. Follow-up interviews were conducted as they were deemed necessary by on-going data analysis via phone and email. Upon gaining entry, all participants were given a one-page summary of the study framed for general readers. At that time, they read and signed an informed consent document which contained my contact information, granted their permission to participate in the research activity, granted or denied permission to be audio taped. They received their own copy of this signed document, which I co-signed. They were also notified that they had the option to cease participation at any time. All participants were guaranteed that identities, specific titles, and school affiliations would be protected at all times during the study and in all references made in the final document.

Data Analysis

Data analysis was an ongoing synergistic process. At times the data analysis was informal direct interpretation of incidents from each case within the collective case study (Stake, 1995). Observations and hypotheses were made after contact with research subjects without conducting formal analysis. The majority of the data analysis, however, was more formal in that I looked for patterns or inconsistencies among the institutions

under study. Formal analysis included coding text, including transcribed interviews (Creswell, 1998; Mertens, 1998; Stake, 1995) with the purpose of fleshing out themes suggested or revealed by the research data (Mertens, 1998; Miles & Huberman, 1994). Formal analysis continued as new research material was folded in as consistencies were affirmed or outliers appeared.

Data analysis was especially open to *emic* issues, defined as research questions or issues suggested by the subjects themselves (Stake, 1995). This was a critically important consideration, as such insight can prove invaluable and quite illuminating. Data analysis concluded when the data analysis process revealed no new information (Miles & Huberman, 1994). Several types of memos were used during data analysis: pragmatic memos, analytic memos, reflective memos, and incident memos.

Significance of the Study

This study has added to the ever-growing body of literature on distance education research. The study also adds to research on the use of technology to disseminate information to people with disabilities who use adaptive technology for web access. Insights gleaned from the study should prove important for both areas because students' access to education opportunities via the Internet remains paramount to their academic and social success.

For example, in 2000 94% of public schools were found to be connected to the Internet, and 80% of the classrooms in those schools had Internet connections (Bick, 2000), so it stands to reason that public school graduates who come to higher education

already know the value Internet access has for their continued education and will continue to rely on that avenue as they pursue their college studies. The growing prevalence of Internet use in course delivery in higher education seems to bear this out. In higher education, the number of distance learning courses more than doubled between 1994-1995 and 1997-1998 from 25,730 courses to 54,470, and enrollment in distance learning courses more than doubled from 753,640 to 1,661,100 during that period (U. S. Department of Education, 1997a; U. S. Department of Education, 1999).

Indeed, unmeasured growth among Internet users in general has been explosive, and studies show there is no sign of decline as the Internet constitutes a major player in commerce, economic growth, information communication (Bick, 2000). Even more important is that according to a recent survey of Canadian college students with disabilities 77% use the Internet and almost half of them need adaptive technology to do so successfully (Fichten, Asuncion, Barile, Fossey, & de Simone, 2001). These statistics present a disturbing picture that should make college and university administrators take note.

If Internet access is ultimately determined a civil rights access issue by the U. S. Department of Justice, Title III of the ADA would apply not only to education, but also to Internet access for the public at large (Konkright, 2001), which could have untold ramifications. Making all web sites of federal agencies ADA accessible with the 1998 passing of Section 508 of the Vocation Rehabilitation Act of 1973 provided unprecedented access to electronically disseminated information for people with all kinds of disabilities all over the world (U. S. Department of Justice, 1998).

This study has also contributed to theory formation by offering an explanation of how implementers at three levels of colleges and universities handle federal mandates to make web-based courses accessible. The study also offers a cogent comparative analysis of two tiers to highlight key variables for further study. Additional theoretical value may be gleaned from reexamining each of the theoretical frameworks used in this study in light of its findings. Organizational analysts and policy evaluators should find useful concepts on which they may build future studies to benefit higher education and, perhaps, other organizations at large.

The results of this study have practical implications as well. They may help web developers and online instructors serve disabled students who rely on adaptive aids by raising awareness of the importance of being proactive in access-friendly web site construction. It may also prove important for educators as they train web developers, so they go to the workplace with a wider range of end-users in mind. In a very real sense, educators would be able to help shape how future site designers affect the web experiences of disabled students, and the general public, everywhere.

Most importantly, this study can help college and university administrators set the pace for how to increase access to the Internet for students and people who use adaptive aids to access web sites. Before steps can be taken toward improvement, however, we must understand current law regarding accommodations for people and students with disabilities and the Internet, guidelines for accessibility to the Internet as suggested by experts, and gauge the level of successful implementation by colleges and universities.

Summary

The purpose of this chapter was to provide a design of the study, which includes an introduction to the topic with a very brief literature review, a statement of the problem, presentation of the research objectives and overarching questions, and the orienting theoretical or conceptual framework. The purpose of this study is to investigate, explain, and characterize the thoughts, actions, and experiences of college and university personnel (implementers) regarding ADA compliance for web accessibility, particularly as it applies to students with disabilities who rely on adaptive technology to access web- based courses. The study seeks to determine the nature of the implementers' roles in policy compliance, their status within their respective organizations, and what their organizations do to facilitate access.

This chapter also identifies researcher bias and proposed methodology. Data needs, data sources, the proposed sample, collection methods, and planned data analysis techniques are also delineated for clarity. A discussion of the significance of the study presents how the study hopes to contribute to research, theory, and practice. Finally, the chapter concludes with an overview of the organization of the rest of dissertation.

Reporting

Chapter II presents a review of relevant literature to lay a foundation for the study. The literature review includes, but will not be limited to, material regarding pertinent laws, disabled college students, and growth in the use of information technology

to disseminate information, including distance education. It also includes organization

theory disability studies literature, and material regarding policy implementation. Chapter

III presents data gleaned from the study, by theme and by site and/or tier or location.

Chapter IV presents an analysis of the data presented in Chapter III. Chapter V puts

forward the study's conclusions supported by data presented in Chapter IV. It also offers

final commentary, lessons learned from the study, implications for further research, and

the conclusion.

Chapter II

Review of Related Literature

The purpose of this study was to explore, understand, and describe the thoughts
and actions of college and university personnel responsible for web-based course
development regarding ADA compliance, particularly as it applies to distance education,
adaptive technology, and students with disabilities who depend on it to access
asynchronous web-based courses. The study sought to determine the degree to which
those who design and create distance education courses are aware of accessibility
mandates and what, if anything, they do with that knowledge in terms of course design to
facilitate access. It is important to review literature collected in several distinct, but
related areas in order to create a context for discussion.

The first part of the literature review contains a brief overview of organizational
theory, turning then to social systems theory and loosely coupled systems. The next
section discusses disability studies, emphasizing theoretical models, distinguishing
disability from impairment, and exploring notions of inclusion and exclusion. I then turn
to pertinent legislation, with two more focused discussions with a look at the Office for
Civil Rights and Higher Education and PL 94-142 and the public schools. The next turn
looks at policy implementation theory in the context of this legislation. I then look at
information technology and the pursuit of equal access, with a more focused discussion

on the concept of universal design. Finally, the chapter closes with a discussion of higher

education and distance education, narrowing in on college students with disabilities in

distance education courses.

Organizational Theory

Briefly, there are three broad categories of organizational theory: classical, neo-

classical, and non-classical. Classical organizational theory is generally characterized by

bureaucratic-like structure that values the organization over people. Weber's (1922)

"Bureaucracy" details characteristics of an institution controlled by policies and

procedures, rules and regulations. Neo-Classical organizational theory challenges the

priorities of classical organizational theory. Instead of placing all value on the

organization, neo-classical theory places increased value on the personnel inside the

organization. Non-classical organizational theory places highest value on the people

instead of the organization.

Social Systems Theory

Social systems theory, a form of Neo-classical theory, proves appropriate as a

macrostructure through which to view the problem of assessing instructional technology

personnel's roles in web accessibility compliance initiatives. According to Gaynor

(1998), the purpose of social systems theory is to explore people's actions in their job

functions in keeping with the "interaction of culture, organizational, psychological, and

physiological factors" (p. 55). Important issues in social systems theory include idiographic and nomothetic variables, which refer respectively to individuals and organizations (Gaynor, 1998). Social systems theory examines individuals as integral elements of organization in the sense that their actions are considered both consciously and subconsciously, to some degree, influenced by the interplay among the aforementioned personal and environmental elements. Another way to look at it is a way to study complex organizations in order to determine their problems and offer solutions.

Shafritz and Ott (1996) describe systems theory as an intricate group of complicated parts including "inputs, processes, outputs, feedback loops, and the environments in which it operates and with which it continuously interacts" (p. 254). Because systems are dynamic, an alteration in any one part of the system affects other parts of the system (Shafritz & Ott, 1996). Shafritz and Ott note that the connections between elements in organizations are frequently "complex, dynamic, and often unknown" (p. 255). Bertrand (1972) pinpoints the social systems dynamic as one of "action and reaction" (p. 34). As a result, when leadership makes choices regarding one part of the company, it is entirely possible for those choices to lead to unintended outcomes elsewhere in the company. Because of this, "systems theorists study these interconnections, frequently using organizational decision processes and information and control systems as their focal points of analysis" (Shafritz & Ott, 1996, p. 255).

The aim of social systems theory is to study human behavior in the context of organizations considering the intersections among an institution's social, structural, cognitive, and physical orientations (Gaynor, 1998). Kast and Rosenzweig (1996) note that one of the most challenging aspects of social systems theory is the manufactured

nature of social organizations. To study them, social systems theorists devised certain structural elements, which are useful for this study. In particular, norms, roles, and role relationships are discussed (Bertrand, 1972; Katz & Kahn, 1966; Katz & Kahn, 1996).

According to Bertrand (1972), there are six structural elements of social systems: from smallest to largest element, we have norms, roles, status-position, situs, station, and subsystem. Norms are defined as accepted rules for behavior; they are also codes by which others' actions are assessed (Bertrand, 1972; Katz & Kahn, 1966). Roles come from an accepted set of actions expected of all people representing a role in any particular working relationship (Katz & Kahn, 1966). The status-position in a social system can be defined as a position or job in a system, but it is important to remember that the position does not represent the individual person holding the job.

Bertrand (1972) goes on to say that several roles (smaller parts) might be involved in the status-position (larger whole), depending on the level of position in the social system, CEO of a company, for example. Situs comes into play when an individual holds more than one status-position in an organization. This is particularly possible in larger, more complex organizations. An example of situs might be a dean who is also a tenured faculty member. Next, Bertrand describes station as relevant only when discussing very large systems such as "communities and societies" (1972, p. 35) in that it is the collection of the individual's situs that constitutes his/her station in the community or society. Finally, the subsystem is a single institutional unit, such as a university or a church. One important element of social systems theory includes the relationships that occur in and among these groups, particularly among the roles.

Katz and Kahn's (1996) approach to systems theory relies on a combination of macro and micro approaches, and they adhere to the philosophy of open systems theory, which means that there is a continual influx of energy to sustain the work of the system. They also believe that roles are the foundation upon which systems are built (Katz & Kahn, 1966).

A few key parts of their theory are important to this study. First, role set is important because role set involves an individual's boss with whom he or she works closely, both literally and metaphorically. Role behavior also plays an important part because it refers to the repeated performances of an individual. Role expectations help lay out the parameters of expectations for individuals in a role set, and received role describes a person's understanding of a message that was sent to him or her. This role is the "influence on behavior and immediate source of motivation for role performance" (Katz & Kahn, 1966, p. 178). Finally, role conflict plays a significant part in the study and is defined by Katz and Kahn (1966) as what happens when competing requests for changes in behavior are made for the same individual at the same time. Granting either request would make it difficult to comply with the other. Essentially, the employee is stuck in a very difficult position.

Gaynor (1998) addresses this issue in his discussion of role expectations, multiple role conflict, and sources of role stress. The difference between generally prescribed functions and reality, should any exist, constitutes the difference between role and role expectation. Additionally, multiple role conflict, which Gaynor claims is produced from competing demands placed on the position by numerous other positions, is not at all uncommon. Examples of role stress include competing demands. Those competing

demands could be everything from time to money to personnel. Other sources of role

stress to be closely examined include the lack of ability to meet the demands placed on

them and the lack of clear expectations (Gaynor, 1998).

Loosely Coupled Systems

Some people believe organizations function as unified, well-oiled machines with

all efforts pulling in the same direction, but most people who work in them know

differently. Daily business is rarely neat, particularly in education. In contrast to the

neatly divided and fully autonomous entities that some entities inside educational

institutions would like to see themselves, Weick (1976) describes a loosely coupled

system where groups are loosely coupled based on the number of variables and the

frequency of contact the groups have in common. The concept is simple. Entities with an

organization are loosely coupled based on the number of variables they have in common

with each other. Otherwise, they are free and independent of one another, and they

operate autonomously. Groups may also be loosely coupled based on the frequency of

contact. Outside of that contact, they are independent. Weick (1976) finds loosely

coupled systems, particularly in educational organizations, in 15 different ways, several

of which have direct bearing on this study:

> (3) richly connected networks in which influence is slow to spread and/or is weak
>
> while spreading; (4) a relative lack of coordination, slow coordination or
>
> coordination that is dampened as it moves through a system; (5) a relative absence

of regulations; . . . (9) infrequent inspection of activities within the system; [and]

(10) decentralization. (p. 5)

According to Weick some of the benefits of loosely coupled systems include the ability to preserve themselves and adapt to new situations. The potential drawbacks seem obvious. Depending on the situation, the lack of coordination or oversight could be costly or dangerous.

Disability Studies

The field of disability studies is relatively new. Some, like Williams (2001), believe the field has not been seriously studied because notions of disability have been pushed to legislative floors or medical wards for so long. Braddock and Parish (2001) review the topic in their comprehensive work "An Institutional History of Disability." Their article chronicles from the beginning of recorded history how people with disabilities were both viewed by society and were treated by society. Their early historical account mostly focuses on the treatment and housing of the mentally ill throughout history to the 19th century though they discuss the treatment of the blind at length. Braddock and Parish do not discuss people with physical disabilities in great detail until they reach the 19th century where important strides occurred both socially and medically. Braddock and Parish considered the 19th century as the century of "institutions and interventions" (2001, p. 39) when schools began to form for people with specific disabilities.

Another important development occurred in the medical community where the medical model became widely accepted as a means of categorizing people with disabilities. One byproduct of this classification was that people with disabilities began to band together. In fact, by the end of the century, deaf people had begun to form the first disability political activist organizations in an effort to assert their preference for what is now American Sign Language over oral education and training in their schools (Braddock and Parish, 2001).

The 20th century revealed both horrors and opportunities for people with disabilities (Braddock and Parish, 2001). Early 20th century mental health professionals and medical doctors practiced eugenics through forced sterilization, and shock therapies were used to control people with mental illnesses. On a positive note, charitable organizations began working in earnest, and for the first time it seems, in the early 20th century to assess the needs of people with physical impairments.

Legislation also appeared on the landscape for the first time. Examples include The Red Cross's Institute for Crippled & Disabled Men (established 1917) and a survey conducted in 1919 in New York to assess needs following the polio epidemic (Braddock & Parish, 2001). Important legislation of the early 20th century includes the first "workman's compensation" law in 1902 in Maryland which provided for workers if they became disabled on the job. Another landmark law was PL 66-236 in 1920, which was the first "civilian vocational rehabilitation law" in the country (Braddock & Parish, 2001, p. 42), designed to help retrain people who had been injured on the job. These pieces of legislation plus later laws already mentioned changed the lives of people with disabilities forever.

Braddock and Parish (2001) raise the important issue of perception of people with disabilities through the voice of a famous blind author and activist. Helen Keller once said that other people's attitudes, not her blindness, were her greatest challenge. She summed up the prevailing attitude of her day by saying "not blindness, but the attitude of the seeing to the blind is the hardest burden to bear" (qtd. in Braddock & Parish, 2001, p. 44). They go on to say that intolerance and ostracism do more to harm the participation of people with disabilities in society than the disabilities themselves. The literature reviewed seems to bear this out.

Theoretical Models

David Pfeiffer (2001) explains the disability paradigm in his article "The Conceptualization of Disability." First, he describes the old disability theoretical model as unsatisfactory because it depends on the notion that the person has an undesirable disorder or has a disorder that has previously caused undesirable consequences in him or her. Consequently, the person is seen as playing the part of the ill or simply as ill. Essentially, the old medical model excuses people with disabilities from society because it says that they are unable to work, attend school, or fully participate in whatever activity as a person without a disability would. In a groundbreaking move in the early 1980s, the National Institute on Disability Research and Rehabilitation revealed a new paradigm. According to the U. S. Department of Education, the new disability paradigm is as follows:

This disability paradigm . . . maintains that disability is a product of an interaction between characteristics of an individual (e.g. conditions and impairments, functional status, or personal and socioeconomic qualities) and characteristics of the natural, built, cultural, and social environments. The new paradigm . . . [focuses] on the whole person functioning in his or her environment. (qtd. in Pfeiffer, 2001, p. 30)

Pfeiffer goes on to contrast the old medical model with the modern disability paradigm which has "at least nine interpretations or versions" (2001, p. 32). Pfeiffer uses key elements of the nine interpretations, discounting what he believes to be fundamental flaws of each, to create a synthesized disability paradigm.

The nine variations he mentions include the following: The Social Constructionist Version (US); The Social Model (UK); The Impairment Version; The Oppressed Minority (Political) Version; The Independent Living Version; The Post-Modern; Post-Structuralist; Humanist, Experience; Existentialism Version; The Continuum Version; The Human Variation Version; and Disability as Discrimination (32-41). The culmination of Pfieffer's (2001) work is the following statement:

The disability paradigm states that the study of the experience of people with disabilities focuses on the following concepts which impinge on the phenomenon of disability and interact with each other and other human characteristics: 1) the process in which the performance of social roles and tasks produces discrimination; 2) the discriminatory treatment of people with disabilities produced by the organization of society; 3) the recognition that an impairment does not imply tragedy and a low quality of life, 4) the stark reality that people

33

with disabilities are an oppressed minority which experiences discrimination, 5) the need of all people including people with disabilities for various services in order to live independently, 6) the realization that all people have agendas so that the unstated assumptions of disability policy must be revealed, 7) the knowledge that people over time move on a continuum from non-disabled to disabled so that eventually every one experiences disability either temporary or permanent, 8) the rejection that there is "normal" human behavior on which social policy can be based, and 9) the all pervasiveness of discrimination against people with disabilities. (Pfeiffer, 2001, p. 45)

From the survey of literature, it seems more theorists adhere to social disability theory than the other eight. Social disability theory posits that society disables people. Some people have limitations, and society itself frequently presents those people with insurmountable obstacles to which they have no option but to acquiesce. Curbs before curb cuts as a standard procedure are a good example. Before a federal mandate to make curb cuts on corners, all people, mobile and not, had to rise to the occasion of the curb. Curbs were created with the average user in mind. After Section 504 of the Rehabilitation Act of 1973 changed the physical landscape of America by requiring curb cuts, elevators, and ramps on new construction, thinking shifted to making the environment "friendly" for a wider range of users. The Social Model is a popular disability theory because it looks at situations from the position of social issues and deeds, sees the disabled as a group and looks for discriminatory acts against them, focuses on "behavior, rights, . . . [and] politics" (Oliver, 1996, p. 34). Critics of the Social Model find that it lacks sensitivity for individual cases and tends to generalize (Oliver, 1996). Marks (1999)

echoes these concerns and adds that it makes disability issues too political, labels people as either disabled or not, and "adopt[s] the values of a capitalist society by prioritising work and independence" (p. 88), which further marginalizes people with disabilities. Williams (2001) notes, along with Pfeiffer (2001) that relying too heavily on the Social Model, or any model for that matter, necessarily closes the door on other possible causes for certain conditions in the lives of people with disabilities. Instead, it lays the blame squarely on the shoulders of society, and some theorists believe that view is simply too narrow to take (Marks, 1999; Pfeiffer, 2001; Shakespeare & Watson, 2001; Williams, 2001).

Another paradigm of note is the Oppressed Minority (Political) Version. As noted by the title, this paradigm assumes that people with disabilities are victims of oppression and discrimination. Pfeiffer (2001) goes on to say that they are faced with obstacles of all kinds, physical as well as intangible, such as the perceptions of others. Some proponents of this theory believe that people with disabilities fit the classification of a minority group, which includes the following qualities:

(1) As a group and individually the members face prejudice, discrimination, segregation, or persecution, or a combination of them. (2) It has a trait which is viewed negatively by the dominant group. (3) It has a collective awareness of itself and its problems. (4) It has an involuntary membership, usually through birth. (5) It experiences endogamy, that is, intergroup marriage. (p. 35-36)

This "minority group" model is more popular in the United States than elsewhere (Williams, 2001), but there are a few problems with this theory as well. While Pfeiffer (2001) does find it useful for studying conduct, and it is useful in the advancement of

disability research, some problems include that the somewhat staunch attitude of some proponents can be discouraging. Pfeiffer (2001) also notes another drawback is that there are many very productive people with disabilities who do not consider themselves disenfranchised.

Disability vs. Impairment

The distinction between disability and impairment is important. Most people might think of disability as the physical challenge that faces individuals - a debilitating illness, a mental disease, a missing limb. On the contrary, according to disability studies and rehabilitation theory, that which deals with the physical realm falls into the category of impairment. Shakespeare and Watson (2001) perhaps describe it best and most succinctly as "an attribute of the body or mind" (p. 17). Davis notes that "impairment is a physical fact, but disability is a social construction. For example, lack of mobility is an impairment, but an environment without ramps turns that impairment into a disability" (qtd. in Braddock & Parrish, 2001, p. 12).

Remarkably, Marks (1999) and Oliver (1996) posit that all people have impairment of one type or another at one time or another in their lifetime; for some, the impairment is transitory while for others, it lasts a lifetime. Impairment can be caused by poverty, poor working conditions, violence, chronic and acute illness, injury, or environmental factors to name a few (Marks, 1999). This notion is particularly important for this study as accessibility for those with impairments is at the core. An impairment of whatever nature is often viewed by many as the first step on a continuum of limitations

36

(Marks, 1999; Williams, 2001). This means that the impairment is just the beginning of persons' limitations within society because of society's predisposition to prejudice, not necessarily because of individuals' lack of ability.

The definition of disability is also important. Again, Shakespeare and Watson (2001) describe it best as the "relationship between a person with an impairment and society" (p. 17). It is the complexity of the relationship that makes the notion of disability interesting for study. In particular, Marks (1999) feels that interaction of the social, physiological, and psychological elements create the intricate disability lens. She believes it all has to do with the way people with impairments are understood and received by others and society at large.

Williams (2001) agrees, noting that the concept of disability is best understood as a "symbolic interaction between the individual and society and the interpretive processes whereby individuals construct meaning from their experiences" (p. 130). Williams goes on to give part of the World Health Organization's 1980 definition of disability: "Disability . . . is the products of complex processes of interacting between an individual with an impairment and the discriminating, disadvantaging, stigmatizing, and prejudiced wider society" (p. 130). The distinction here between impairment and disability is important because it challenges what average readers think about the terms, distinction between the terms, what, if any, role they believe society plays in disability, and what current theory presents about disability studies.

Inclusion and Exclusion

The notions of inclusion and exclusion in disability studies are important with regards to how persons with impairments are seen in society. Historically, there are two ways of looking at inclusion. First, there is Tonnies concept of Gemeinschaft, which theorizes that everyone in society has a predetermined place and purpose, and each person should fulfill his or her role. Characteristics of Gemeinschaft include a set of similar customs and norms among the people, standard, fixed jobs with duties, and established relationships. People who do not fulfill their role in this society are ostracized (Ravaud & Stiker, 2001). There were certain roles in older times that were open to people with impairments, such as court jesters. However, those roles that were open to them also limited them and kept them subjugated. The opposite of Tonnies's Gemeinschaft is Gesellschaft, and it means that someone's place in society is not predetermined. Instead, it is open for negotiation, so people can choose and make their own way, but they do not have to make that way alone. They can make that way together. There are different customs and norms, job opportunities, and the chance to move anywhere people would like. At the same time, it is possible to be in the middle of a noisy crowd and be completely alone. Ravaud and Stiker (2001) make their point based on Durkheim's social theory that it is at once possible to be "excluded from society", and it is possible to be "excluded within society" (p. 491). People with disabilities can be among others and still be excluded from society.

Some of that exclusion from within comes from people's negative attitudes, and some of it comes from the fear that accompanies lack of understanding. Esses and

Beaufoy (1994) conducted a study to determine attitudes based on impairment. The purpose of the study was to examine the construction of the perceptions regarding individuals with impairments to better understand the elements that might precipitate the poor outlooks. They learned that if people's impairments were accidental or perceived as no fault of their own, others' perceptions of them were generally favorable, sympathetic, and charitable. It follows that people are more likely to include people whose impairments fall in the category of accident or uncontrollable. On the other hand, participants were not as charitable towards others when they felt the individual brought on the impairment. AIDS is a good example. No matter how a participant contracted the illness, the perception is that the impairment could have been prevented. These participants exhibited negative emotions such as "discomfort, tension, anxiety, and unease" (Esses & Beaufoy, 1994, p. 46). Principles of exclusion, therefore, include both social constructs, such as the lack of access presented by missing elevators or curb cuts, and personal attitudes.

Pertinent Legislation

Significant legislative progress for people with all kinds of disabilities began with President Nixon's 1973 authorized amendment for the Vocation Rehabilitation Act, section 504 in particular, which prohibits discrimination of people with disabilities by any organization that accepted federal financial assistance, including higher education institutions (Rothstein, 1997a) though the language of the law itself was very vague. As a testament to concerted legislative response to the plight of people with disabilities,

however, careful consideration of the origins of the authorized amendment proves enlightening. Rather than resulting from the concerted efforts of public advocates and new-found legislative support for the handicapped in America, inclusion of Section 504 in 1973 amendments to the Vocation Rehabilitation Act resulted solely from the covert efforts of legislative staff personnel (Rothstein, 1998). According to Laura Rothstein (1998), renowned disability law expert, section 504 was, in fact, added by "Senate committee staff . . . relatively late . . . in the legislative process" (p. 19). Rothstein explains that the majority of Congressional delegates "either were unaware that section 504 was included in the Act or saw the section as little more than a platitude, a statement of a desired goal with little potential for causing institutional change" (1998, p. 19), so it passed with little to no attention. While inclusion of Section 504 in the Vocation Rehabilitation Act of 1973 proved fortuitous for people with disabilities, particularly college-bound students with disabilities (Salomon, Lloyd, Shaller, & Hewitt, 1994), the circumstances under which it was considered, included in the revised Act, and passed shed light on an era's prevailing attitudes towards those with disabilities.

In contrast, the Americans with Disabilities Act of 1990 and Section 255 of the Telecommunications Act of 1996 passed with significant legislative attention (Rothstein, 1998), and both prove critical for students with disabilities in higher education. Specifically, ADA delineates most topics not covered elsewhere in law regarding discrimination of people with disabilities. Specifically, higher education students with disabilities cannot be discriminated against with regards to admissions and requests for classroom accommodations, such as note takers, distraction-free testing situations, and the use of tape recorders or computer technology. Section 255 of the

Telecommunications act proves equally vital, as it requires manufacturers of "telecommunications equipment and broadcasters . . . [to] provide access" for easy use of their products by people with disabilities wherever feasible (Disability Rights Office, 2005; Rothstein, 1997a, p. 18). This mandate includes teletype writer (TTY) machines for deaf or profoundly hard of hearing, closed-captioning on videos for the deaf, and Braille numbering on public telephones for the blind. While Section 255 of the Telecommunications Act requires accessibility initiatives for adaptive technology, such as screen readers for the blind, whenever possible, it includes a rather vague definition of "readily achievable" or "whevever feasible" (Borchert, 1998; Disability Rights Office, 2005; Rothstein, 1997a, p. 18). What this means is that manufacturers have a great deal of latitude when it comes to interpretation of easily accomplished, which gives them an easy out in terms of design. Nevertheless, where once differently-abled students could barely conceive of a college education, it appeared that significant barriers had finally been removed.

Perhaps the most important aid to assistive technology accessibility awareness, however, is recent federal legislation. In 1998, the Rehabilitation Act of 1973 was significantly strengthened by the inclusion of Section 508, which requires all federal agencies to ensure public accessibility no later than June 2001, especially those who use adaptive technology, to government electronic and information technology. Additionally, Section 508 applies to federal agencies when they "develop, procure, maintain, or use such technology" (Access Board, n.d.).

Section 508 will very likely do more for raising adaptability awareness among software manufacturers and computer manufacturing than all extant law has to date.

Because of this new federal requirement, federal agencies can only purchase equipment and software and contract with services that are accessible for people with disabilities who use assistive technology. These purchases include both hardware such as computers and all software necessary to conduct business. Government agencies constitute an enormous consumer of these goods and services, and because all agencies that receive federal technology money must abide by the government's Section 508 technology policies, software and hardware manufacturers will very likely adjust production practices accordingly to remain eligible as suppliers. The same could be true for agencies and industries that regularly conduct business with government entities. Because of increased attention to accessibility standards by federal agencies in their own offices, it stands to reason that inattention to compliance issues accompanying web-based instruction spells trouble for non-responsive colleges and universities.

Sarason (1996) poignantly notes that for as much progress has been made in challenging public opinion of discriminatory practices, "deeply rooted attitudes, ingrained and reinforced by tradition and institutional and social structure and practice, are not changed except over a long period of time" (p. 245). Though this statement refers to racial discrimination, it is especially descriptive of the history of America's students with disabilities, especially those in public schools. In 1970 nearly one million public school aged children with mental and/or physical handicaps had been segregated from or denied access to public school classrooms (National Council on Disability, 2000a). Until the passing of Public Law (PL) 94-142 in 1975 no legal mandates provided for their education.

PL 94-142 guarantees every child with any disability a free and appropriate public school education in the least restrictive environment (National Council on Disability, 2000a; Rothstein, 1997a; Sarason, 1996), which means that teachers and administrators must provide educational accommodations for all students with disabilities equal to that enjoyed by all other school children. Today, more than 6 million students with disabilities attend public schools. Almost 30 years after such groundbreaking legislation, compliance with PL 94-142 remains spotty (National Council on Disability, 2000a) due to poor local and state support (Rumble, 1978; Sarason, 1996), insufficient compliance measures (National Council on Disability, 2000a), and public school personnel's modest training and skeptical attitudes regarding mainstreaming (Blietz & Courtnage, 1980). While a recent study by the National Council on Disability (2000a) acknowledges great strides toward equal education opportunities for all school age children, much remains to be done because "PL 94-142 enforcement . . . [is] inconsistent, ineffective, and lack[s] any real teeth" (p. 5).

Progress for students with disabilities in higher education has been similar. A common misconception exists that higher education students have long been protected by laws similar in purpose to PL 94-142. Many mistakenly believe that Section 504 of the Rehabilitation Act of 1973 protects students with disabilities in higher education because it specifically prohibits discrimination by any agency that receives federal money. According to Rothstein (2000), however, the law only offers students with disabilities protection from discrimination by federal contractors or federal agencies; an extension of that protection to higher education is questionable because the legal phrasing of the document remains unclear.

It was not until the Civil Rights Restoration Act of 1987 and the Americans with Disabilities Act of 1990 that the language of the law grew broad enough and specific enough to unequivocally protect students with disabilities in higher education from discrimination in admissions and access (Rothstein, 2000). The Americans with Disabilities Act of 1990, which covers virtually all aspects of society, changed all that. For the first time, federal law prohibits discrimination of persons with disabilities both in the institutions in which they are educated and in the places in which they work (Edwards, 1994). This event makes it increasingly more important to ensure comparable and competitive higher education opportunities for all college students with disabilities.

The combined efforts of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act provide current higher education students with disabilities unparalleled access to a quality college education. Because the Americans with Disabilities Act is quite specific in its application to higher education, it provides college students with disabilities the opportunities they need to have a reasonable chance for success. To qualify for admission, students with disabilities must possess the academic and intellectual ability to pass admission standards dictated by their choice of colleges. Once beyond that challenge, students must meet the benchmark of "otherwise qualified." "Otherwise qualified" denotes that were it not for their disability, they would be on par with the academic abilities of all other students on campus. However, though they are intellectually and academically prepared for college-level work, they may need logistical assistance in the form of accommodations, such as interpreters for the deaf, note takers for the physically challenged, or the use of computer technology to take notes for mobility or visually impaired students.

Once admitted to the college, students with disabilities, like all other students, must maintain good academic standing in order to retain enrollment, and they must self-disclose their qualifying condition(s) to appropriate school authorities in order to receive reasonable accommodations (Rothstein, 1997a). To comply, colleges and universities are required to make reasonable accommodations for students with disabilities so long as those changes do not fundamentally alter the content or form of the program or course (Levy, 2001). Colleges and universities must ensure that any accommodation provided to disabled students remains comparable to the experience of all other students in terms of class experience and effective communication. A written transcript of a class lecture, for example, is not as effective at communicating nuances of discussions as a live interpreter would be for a deaf student in a classroom. Thus, the transcript alone fails to meet federal requirements of equal, effective communication, and alternative accommodations must be pursued.

Office of Civil Rights and Higher Education

Inattention to existing laws protecting the rights of students with disabilities who use adaptive aids to access technology for their asynchronous web-based courses proves especially troubling given increased attention to the issue by the U. S. Department of Education's Office of Civil Rights (OCR). To date, OCR appears unsympathetic to colleges and universities' financial circumstances when faced with retooling distance education sites for students with disabilities, which might mean adding captions to streamed video or streamed audio, adding alternative text to graphics, or reconfiguring

45

data disseminated in tables into accessible forms (Patrick, 1996). OCR's position is especially noteworthy considering that American colleges and universities offer over 54,000 individual web-based courses, many of which are quite sophisticated (U. S. Department of Education, 1999).

Change requires time and money, and ORC's expectation is that if colleges and universities can afford to maintain expensive programs, foster academic growth, and plan for expansion, they can pay for accessibility initiatives without undue burden (Patrick, 1996). OCR has already handed down rulings in favor of students with disabilities because their schools did not provide accessible avenues for comparable, effective communication beginning as early as 1997. One notable case involved a student with low vision who could not access information on a course web site (Stahl, 1999). The student was told to make an appointment with a reader who would transmit the information to the student. When deciding the resulting discrimination suit, OCR found the university guilty of denying access to the student.

Three crucial OCR position statements came from that suit. First, OCR reiterates that colleges and universities must understand ADA's definition of effective communication. For the purposes of information transmitted via web sites, ADA's definition of effective communication concerns how quickly the information can be given to students, the preciseness of the transcription, and preparation in a fashion and type equal to the importance of the information and the capacity of the person with the challenges (High Tech Center Training Unit, 1999; Paciello, 2000; Stahl, 1999; Waddell, 1998). It is neither simply enough then to provide a straight text-only rendering of course text online, nor is it enough to provide a printed transcript of a video-streamed lecture.

Course material must be offered in a manner comparable to that experienced by other students in the class (Carnevale, 1999); few would argue that college classes are little more than words on a page. They include the persona of the instructor, dynamics of class discussion, and commentary by classmates. Straight text transcription cannot capture these elements whereas a live real-time interpreter plus a transcript plus other options would.

Another important stance rendered in this case's decision is that OCR holds colleges and universities liable for not having plans of accessibility implementation on record. According to Title II of the ADA, colleges and universities are required to conduct self-studies to determine their readiness and ability to comply with federal law, but effective monitoring systems remain essentially non-existent. It is not enough, according to ORC, to handle student complaints about inaccessible web-based courses on a case-by-case basis (High Tech Center Training Unit, 1999; Paciello, 2000; Waddell, 1998). Instead, colleges and universities should have plans in place *and* work diligently to remedy inhospitable sites (Patrick, 1996). More importantly, higher education institutions are expected to create new courses in compliance with accepted OCR standards.

To substantiate its position, OCR likens retrofitting course or school web sites or creating new ones to structural access issues for new and existing physical structures on campus. The same is true for the purchase of software and hardware. Essentially, the cost of ensuring equal access is typically not considered an undue burden when the same financial burden might have been substantially minimized if the matter of accessibility had been considered during the creation of the online courses (High Tech Center Training

Unit, 1999; Paciello, 2000; Waddell, 1998). While OCR has yet to put into writing guidelines for web site accessibility for students who use adaptive aids, such mandates seem imminent given their recent decisions and higher education institutions' increased reliance on the Internet for the transmission of information. While OCR has yet to establish concrete guidelines for universally accessible online courses, mounting attention to such issues suggests it will not be long.

PL 92-142 and the Public Schools

Unfortunately, literature regarding current attempts by colleges and universities to open access to web-based courses and other web-driven initiatives remains remarkably scarce. Indeed, what little is available describes what can and must be done to facilitate accessibility (Paciello, 2000; Waddell, 1998), but none details what colleges and universities are actually doing. However, a sizeable body of literature does exist that may be used to better explain the void in descriptive literature and understand higher education's sluggish response to the law. An examination of public school personnel's experiences with the introduction of PL 94-142, educators' and parents' attendant responses, and subsequent compliance efforts may help illuminate the current status of students with disabilities who use adaptive technology to access web-based courses.

Public schools were the first institutions faced with federal mandates to accommodate students with disabilities in 1975 with PL 94-142. Prior to that, federal courts ruled in *Pennsylvania Association for Retarded Children (PARC) v. Pennsylvania* that mentally retarded children should not be denied a public school education and in

Mills v. Board of education (Mills) that students with any disability should not be denied a public school education (Herr, 1976; Rothstein, 1997a). Both decisions laid the foundation for PL 94-142, which extends the basic guidelines of the Education of the Handicapped Act of 1966 (Department of Health, Education, and Welfare, 1978) to mandate free and appropriate educational opportunities for all handicapped children irrespective of disability type (Rothstein, 1997a). PL 94-142 also requires that the education occur in the least restrictive environment (Herr 1976; National Council on Disability, 2000a; Rothstein, 1997a; Sarason, 1996).

Because of PL 94-142, all handicapped children between the ages of 3-21 are now protected by law from discrimination based on cognitive or physical ability or the requirement to pay for private schooling (National Council on Disability, 2000a). Additionally, the law essentially mandates that public schools provide the same or equal quality and amount of education as that provided for all other children (Sarason, 1996; Rothstein, 1997a). Without the provision that the same or comparable education be provided in the least restrictive environment, too many schools opted for the most economical route (Zigler & Muenchow, 1979), which, unfortunately, was not necessarily the best possible placement for the disabled children. The legal requirement of and definition for the least restrictive environment ensures that handicapped children experience education in surroundings that least segregate them from other school children and offer them the best possible developmental opportunities.

Not surprisingly, PL 94-142 was moderately embraced by some and resisted in varying degrees by most. Concerns of public school personnel fall in three camps: implementation issues, public school personnel attitudes, and teacher preparedness

49

(Rumble, 1978; Sivage, 1979). Two issues regarding school administrators include the use of power and the degree of commitment to change. Because the nature and degrees of power inherent in those involved -- administrators, teachers, parents, and children -- remained quite unequal, the power to accomplish and sustain requisite compliance initiatives seemed disproportionately placed upon a few (Sarason, 1996).

Furthermore, because the federal compliance requirements remained unclear, too many opinions inappropriately influenced schools' abilities to implement, improve, and sustain viable programs. Other implementation issues involved organizations' dedication to compliance. The chief concern included the lack of commitment of resources for beginning and sustaining an appropriate program (Marmor, 1983; Sarason, 1996; Weatherley & Lipsky, 1977; Zigler & Muenchow, 1979). Others worried about fiscal and logistical challenges (Rumble, 1978; Weatherley & Lipsky, 1977), and poor working relationships also created problems. Some teachers worried about their ability to teach and manage handicapped children along with the other children in one classroom (Blietz & Courtnage, 1980; Rumble, 1978; Sarason, 1996) while others simply hoped the initiative would disappear (Sivage, 1979). Practical matters were special concerns for teachers. Many felt, and research affirms, that they were not given adequate preparation in terms of both time and techniques to handle handicapped children in their classrooms along with their other teaching responsibilities. They lobbied for help in the classroom, training to understand the plight of handicapped children, and practical techniques for helping handicapped children perform to their best potential in school (Blietz & Courtnage, 1980; Rumble, 1978; Sarason, 1996; Sivage, 1979; Weatherley & Lipsky,

1977). Many simply wanted time to absorb, process, and adjust to the change (National Council on Disability, 2000a).

In 2000(a), the National Council on Disability published its report on nationwide compliance with PL 94-142. After almost three decades, the National Council on Disability concludes that while some measurable progress has been made, the majority of schools and governing state bodies fail to demonstrate serious commitments to improving the environments in which handicapped children learn. National Council on Disability's conclusions raise cause for concern considering that there are now more than 6 million handicapped public school age children who qualify for the protection PL 94-142 is supposed to offer (2000a, p. 6). Though parents and advocacy groups have made great legal strides, and the federal government only occasionally sanctions states and schools for unacceptable compliance, substantive change apparently remains elusive.

Reaction to ADA of 1990 by the public and colleges and universities was similarly mixed. For the first time, students with disabilities gained what they deemed definitive protection. Researchers now understand that disabled students had not viewed Section 504 from 1973 as reasonable recourse against discrimination before 1990 because the statutory verbiage remained inconclusive. Some believe, however, that appeals to Section 504 in protest to discrimination would have been valid had the courts been more favorable (Rothstein, 2000). Higher education personnel and legal advocates were even less enthusiastic.

Unlike the public schools under PL 94-142, colleges and universities have essentially been left to their own devices in their response to the law in that they have only been required to conduct self-evaluations of accommodation efforts, which are

largely tied to issues of accreditation (Rothstein, 2000). Federal courts and agencies'

responses have been similarly sluggish as they delay the creation of crystal clear

regulations, circumstances undoubtedly fueled by the markedly small number of

attorneys who specialize in disability law (Rothstein, 2000). Because of this, courts

handle complaints by higher education students with disabilities on a case by case basis

rather than develop basic universal standards that are byproducts of collaborative effort

and informed decision-making processes (Edwards, 1994).

According to Weber (1998), once a student with a disability files a compliant, and

it reaches the district office, the Office of Civil Rights no longer retains jurisdiction;

instead, oversight falls to the Department of Education, which frequently files a court

order demanding compliance from a university rather than file a law suit. Some

complainants may look to the Department of Education for assistance because their

services do not cost complainants money, unlike traditional legal counsel.

While this arrangement may seem appealing, students and their parents do not

often understand that the Office of Civil Rights and the Department of Education are not

nearly as aggressive about just treatment as a private attorney might be; for most,

however, private counsel simply is not an option. Part of the price for free and affordable

representation is that cases infrequently come to the public at large. In fact, Rothstein

(2000) argues that because disability legislation and cases draw so little attention, people

with disabilities were unaware for years that many of the injustices they suffered were

guaranteed protection by Section 504 of the Rehabilitation Act of 1973. She attributes

other obstacles to the length of time required to develop appropriate regulations

(Rothstein, 2000).

Sometimes the judicial system itself complicates progress for students with

disabilities. First, legislators hinder progress by delaying important legislation or

hesitating to support action that targets a minority (Borchert, 1998) for fear of public

disapproval. Their attitudes and the tendency of people in general to segregate and

stereotype also create invisible barriers for important legislation; in fact, several

researchers identify the courts themselves, including the Supreme Court, as playing a

substantial role in perpetuating prejudicial attitudes towards people with disabilities

(Cook & Laski, 1980; Konur, 2000; Rothstein, 1998). Perhaps the most tangible barrier

to legislative progress is courts' inconsistency in their interpretation of the law (Bick,

2000). Disability law is admittedly complex, and the courts' unwillingness to set

fundamental, standard precedent for equal rights for all (Rothstein, 2000) further hinders

progress.

Policy Implementation Theory

Because this study focused on the degree to which colleges and universities move

toward full compliance with mandates that web-based courses be fully accessible for all

students with disabilities, it also seems necessary to consider policy implementation

theory, particularly that found in policy evaluation research (Berman, 1978; Hargrove,

1975; Lipsky, 1969; Lipsky, 1980; Van Meter & Van Horn, 1975; Weatherley & Lipsky,

1977). Policy implementation theory helps with this study by showing where institutions

succeed and fail at putting current policy into practice. It is useful because analysis

focuses on elements of theory such as where the institutions help or hinder the attainment

53

of implementation, barriers such as lack of resources, and the particulars of implementers'
behavior. Traditional political science perspectives hold that if philosophical and
legislative differences involved in formulating guidelines fail to be adequately addressed,
the final product will then somehow express the discord, and resolution must be sought
(Beyer, Stevens, & Trice, 1983). In contrast, policy evaluation research looks to the
implementation of policy, not the creation, as the root of problems.

Policy implementation can be defined as acts by people or groups for the purpose
of attaining a set of predetermined goals that were set forth by law or public policy (Van
Meter & Van Horn, 1975). Van Meter and Van Horn go on to say that the study of policy
implementation looks at those things that help or hinder the attainment of program goals.
It is terribly naïve to assume once a policy exists compliance will follow since there are
many obstacles in the way. It seems the largest obstacle is the implementing organization
itself. Of the more notable barriers to change, the lack of resources, failing funds,
satisfaction with the status quo, "psychic costs," "accumulation of official and unofficial
constraints on behavior," and organizational control top the list (1975, p. 453). It seems
important to understand how implementing organizations operate in order to better the
construction of policy plans and improve their implementation (Hargrove, 1975).
Hargrove notes that it is particularly important to understand key relations inside the
institutions to see how they affect the implementation of policy because there are too
many opportunities for miscommunication and misunderstanding.

Studies of policy implementation by Berman (1978), Lipsky (1969, 1980) and
Weatherley and Lipsky (1977) are particularly useful for this study. Berman (1978)
differentiates levels of implementers, from the macro level (federal) to the micro level

(local) implementers and notes that each plays equally important though different roles in the implementation of policy. Weatherley and Lipsky (1977) call the micro level, local implementers "street-level bureaucrats," and it is with them, they claim, that real public policy is made. Berman (1978) contends that the problem with policy implementation is not the policy itself. Instead, problems stem from within the organization in its attempt to implement. Berman's concept of implementation rests on three principles: macro-implementation, micro-implementation, and loosely coupled systems. He describes macro-implementation as when the federal government exerts its authority over smaller, local authorities or agencies to get them to act in certain ways. As a result, local agencies have to get their constituents, or internal operators, to respond and implement the policies. The local process is micro-implementation. Berman uses the notion of loosely coupled systems to relate macro-implementation and micro-implementation, using examples of bureaucratic agencies, "courts, public and private interest groups, local delivery systems, clients, and local actors" (p. 10-11). I maintain that loosely coupled systems can be used to describe micro-implementation within an organization as well.

All of the policy implementation theorists mentioned above (Berman, 1978; Hargrove, 1975; Lipsky, 1969; Lipsky, 1980; Van Meter & Van Horn, 1975; Weatherley & Lipsky, 1977) are interested in location and setting as a problem in the implementation of policy, but they also look toward the behaviors of personnel as a key factor. Berman (1978) believes that the policies are only implemented because of the efforts of the "street-level bureaucrats" (p. 20), or the people on the ground floor. He maintains that because of the nature of large organizations, they have enough autonomy and local authority to make or break policy where it meets the public. According to Berman, when

policy gets to this level, one of four types of responses is possible. First, nothing can happen. The worker will elect to adopt no part of the policy or plan and will not change his or her behavior. Second, the person will not change his or her behavior, but will adopt enough of the policy to allow for current organizational practices. Third, no part of the policy will be adopted, but organizational behavior will be modified to allow for the policy. Lastly, the policy will be adopted and organizational behavior will be changed. Berman maintains that effective policy implementation occurs only with this last option in the micro-implementation level.

Lipsky first developed the concept of the street-level bureaucrat in 1969. Street-level bureaucrats are "Public service workers who interact directly with citizens in the course of their jobs, and who have substantial discretion in the execution of their work" (Lipsky, 1980, p. 3). Street-level bureaucrats include law enforcement officers, educators, and officers of the court, to name a few. Their usual operation includes constant interaction with the public, and the ability to use their own judgment and assert their independence. The potential effect on their constituents is far reaching. Lipsky believes street-level bureaucrats are important because they have the potential to significantly influence the lives of those whom they serve. In many ways, they "determine eligibility of citizens for government benefits and sanctions . . . In a sense street-level bureaucrats implicitly mediate aspects of the constitutional relationship of citizens to the state. In short, they hold the keys to a dimension of citizenship" (1980, p. 4).

Lipsky (1969, 1980) describes the typical environment of the street-level bureaucrat as having poor assets, having his/her authority constantly challenged, and getting unclear or conflicting messages about job performance. Because of these

conditions, Lipsky believes that workers develop coping mechanisms, which are often unapproved by the organization (1980) to deal with the situation. Lipsky (1980) found that some street-level bureaucrats exhibited the following behavior: cut back on work, levied authority on constituents, cut back on resources for workers, left the organization, withdrew from their work emotionally, began stereotyping clientele, and passed work on without examining it too closely. Weatherley and Lipsky's (1977) study of coping mechanisms revealed that implementing personnel who develop their own coping techniques may "in the aggregate, constrain and distort the implementation" (p. 171).

Another issue with street-level bureaucrats concerns role anxiety. Lipsky believes the source of role anxiety comes from one of three places: coworkers, people who have similar roles in the organization, and "reference groups" (1980, p. 142). To deal with role anxiety, Lipsky (1969) believes street-level bureaucrats try to influence those who have authority over their jobs, carry out some portion of their job with some modicum of success even if they cannot be successful all of the time, or modify the groups of people they serve. In this way, they exercise control over their own situations.

While Weatherley and Lipsky (1977) focus more narrowly on the implementers as instruments or impediments of change, social systems theorists and organizational theorists such as Hall and Quinn (1983) and Beyer, Stevens, and Trice (1983) analyze the implementing organizations as critical instruments for change in policy implementation or implementation failure. Both higher education and common education have little discretionary money in comparison to their general operating budgets, which makes implementation and regulation difficult (Berge & Muilenburg, 2000). It is difficult to anticipate the cost of new policy implementation (Weatherley & Lipsky, 1977). However,

higher and common education institutions improvise in order to meet the letter of the law as best they can. This sometimes means interpreting the law in ways that cost the least amount of money, yet still remain marginally compliant (Giedosh, 2000; National Council on Disability, 2000a; Rothstein, 2000; U S. Department of Education, 1997b; Zigler & Muenchow, 1979).

Marmor (1983) and Weatherley and Lipsky (1997) argue that clear-cut, transparent policies mandating accessibility remain elusive because of the nature of American politics. Accommodating people with disabilities of all natures requires forethought, and good intentions drown in bureaucratic red tape. Marmor (1983) speculates that as far as most people are concerned social welfare policy extends only so far, and people with disabilities still make up a population minority, albeit a growing one. It seems then that few should be surprised when considerations for people with disabilities remain secondary with regard to the creation of technological conveniences.

Information Technology and the Pursuit of Equal Access

Accommodations for disabled students in higher education became significantly complicated by the evolution of alternative technologically driven education delivery systems, specifically web-based distance education. Prior to 1969, distance education courses were mostly correspondence based (Flottemesch, 2000), but today, distance education courses and accredited degrees are distributed to students through web-based course initiatives and interactive television (I-TV), where students and an instructor in one location may be seen and heard by a group of students elsewhere and vice versa.

Standard Internet courses can also be as interactive as a traditional classroom through the use of threaded discussions or synchronous chat. Recent innovations such as live web-casts, video streaming, and audio streaming, increase the interactivity of online courses even more. Instructors and students may also interact through web cameras mounted on the top of the sending and receiving computers. Still another, albeit more expensive, option for colleges and universities is wireless relay using satellite technology. Class interaction, depending on the sophistication of the equipment on both the sending and receiving ends, can be very near real time, and if both have audio cards and microphones, both students and instructors may be seen as well as heard.

The same technological barriers that keep people with disabilities distanced from information, goods, and services also inhibits the participation in higher education distance education courses by students with disabilities who use assistive technologies. Section 255 has increased general access for millions of people with disabilities to means of communication considered vital to living, such as the telephone and television. No such laws create basic standards by which all web site developers must abide though there are suggested guidelines (Paciello, 2000; Waddell, 2000).

The first critical barrier for disabled students who rely on adaptive aids is web site structure. If the course site, or any college web site, relies on any one of the following elements to convey information to students, the risk of inaccessibility by assistive technology increases: color-coding, visually organized material (e.g. lists without numbering), graphics without alternative text, split frames, tables, or streamed audio or video without captioning. These elements represent the most common trouble spots for assistive technology because a screen reader, for example, cannot distinguish colors, so

color coding information such as assignment due dates in a web-based course, constitutes an accessibility barrier.

The same is true for text organized spatially. Screen readers do not prioritize text unless itemized lists are numbered. Screen readers will only vocalize words in succession without regard to special placement on the screen. Making meaning of those words is then left to the blind student. Unidentified graphics, split frame screens, and tables pose more serious problems for students dependent on assistive technology. Alternative text tags must be used in any Internet-based course that uses graphics, so when a student who relies on a screen reader positions his/her cursor over a graphic, a text-based description of the image appears for the screen reader to verbalize (Benner, 2001; Paciello, 2000). Without the alternative text, a screen reader will simply identify the graphic with the word "image," which means nothing to students. Instead, a description of the image would be more appropriate.

Other issues include the inability to synchronize the screen reader with the mouse (Lazzaro, 1994), which essentially leaves the user reliant on the screen reader to eventually move to the page or part of the page of interest. If the page or site is sizeable at all, one maneuver like this could take a significant amount of time. Even more serious accessibility issues arise with the use of split screens and tables. Students with disabilities who use adaptive technology currently have a very difficult time of quickly and effectively navigating tables that use cells and borders and sites with split screens (Paciello, 2000). What most students consider simple navigation steps become Herculean tasks for disabled students who use assistive technology.

Another set of serious problems resides in the heavy reliance on graphics-based or Windows-based platforms, which are used by most web site developers. Until recently, Windows-based platforms were inaccessible by many who use adaptive technology because while Windows software relies on graphics and icons, adaptive technology is strictly text-based (Waddell, 2000). In layman's terms, most computer users "click on" icons or images of various things, from the little printer icon in a Microsoft Word document to print to a larger "E" to launch Internet explorer, one of several platforms used to navigate the Internet. Adaptive technology is text-based, much like what we recognize as "old" DOS computer programming. Computer programs are either text or numerically based, but the icons have been added for the convenience and efficiency of lay users. Using a computer for most people is now as easy as a "point and click" on the screen. However, students with disabilities who navigate with adaptive technology, the process can be very challenging.

Microsoft has made useful modifications to the accessibility portion of its software design with the introduction of Windows XP (Microsoft, 2001). More often than not, however, developers are either unaware of or are not concerned about suggested accessibility standards, and participation by students with disabilities who rely on adaptive aids is stymied. Business and industry frequently produce adaptive technology solutions that are antiquated in no time (Brewer, 1983), a phenomenon that can be explained by Moore's Law, which postulates that technology advances in complexity and power over progressively shorter periods of time (Daggett, 2002).

Some initiatives do exist to assist web developers with accessibility efforts. For example, several federally sponsored groups established universal design principles and

61

guidelines for creating accessible sites for those who use adaptive technology. Others

concentrate on the dissemination of easy to understand information regarding current law

and best practices (Information Technology Technical Assistance and Training Center,

2001) while still more offer additional assistance in the form of company training, up-to-

date press releases regarding accessibility issues (Web Accessibility Initiative, 2000).

Additionally, some non-profit groups concentrate their efforts on offering diagnostic and

corrective services for organizations concerned about the accessibility of their web sites

(Web Accessibility Initiative, 2000). A few key government sponsored groups

concentrate their efforts on studying and reporting assistive technology accessibility

issues in public schools and higher education institutions as well (National Council on

Disability, 2000b). Notable independent groups help too. WebABLE, founded by Mike

Paciello, exists to ensure web accessibility for all people with disabilities. To accomplish

this goal, WebABLE personnel offer educational seminars, organizational consulting, and

diagnostic/corrective services (Paciello, 2000). The problem seems to be that while the

information reaches the hands of groups of people in seminars and those who reach out

for it, it does not appear to reach single users.

Universal Design

While these groups have embraced federally endorsed guidelines by the World

Wide Web Consortium (1999), several of them have also embraced principles of

universal design. The Center for Universal Design (1997) defines universal design as the

creation of goods, services, and environments of which all individuals may partake, to the

largest degree conceivable, with no demand for special modifications. The principles for

universal design are fairly simple - to give equal access to goods, services, and

environments to all people. The seven principles of universal design are as follows:

Principle 1: Equitable Use

Principle 2: Flexibility in Use

Principle 3: Simple and Intuitive Use

Principle 4: Perceptible Information

Principle 5: Tolerance for Error

Principle 6: Low Physical Effort

Principle 7: Size and Space for Approach and Use (Story, 2001, p. 10.6)

One example of universal design in practice can be seen in equitable use in many public

phones. Modern public phones have "a keyboard and a light-emitting diode (LED)

display as well as a volume control [that] can be used by people with hearing

impairments to make calls . . ." (Story, 2001, p. 10.9). Ideally, the more than one phone

would be placed at the same location, and they would be placed at different heights, all

with ledges for phone books or other belongings (Story, 2001).

While this sounds a bit like the Americans with Disabilities Act, it is not, and the

two are not interchangeable (Welch & Jones, 2001). A panel of 10 experts made up of

architects, engineers, and others developed the seven principles of universal design,

which are "equitable use, flexibility in use, simple and intuitive use, perceptible

information, tolerance for error, low physical effort, [and] size and space for approach

and use" (Burgstahler, 2002; Story, 2001, p. 10.6). The goal of universal design is the

reduction of all barriers for all people in all products. Accessible design does not

accomplish that goal (Story, 1998). For example, what an accessible design resolves for one person with a disability may actually create a barrier for another. Universal design's purpose is to eliminate barriers altogether.

One particular problem with universal design is people's tendency to use the terms universal design and accessible design interchangeably. According to Welch and Jones (2001), design instructors do this frequently in hopes of teaching their students that universal design is a means to accomplish accessibility for people with disabilities. The problem is that universal design does not equate to the building codes required by the Americans with Disabilities Act (Welch and Jones, 2001). At the same time, while universal design is a good goal for web accessibility for most users, it is not a substitute for the World Wide Web Consortium's recommended guidelines or individual states' developed guidelines that have been built on federal standards, Section 508 of the Rehabilitation Act. Instead, change must occur so that web developers create sites with form, function, and the end user in mind (Witt & McDermott, 2004).

Higher Education and Distance Education

Both higher and common education representatives report the lack of field experts as a barrier to achieve accessibility for students with disabilities. Public school teachers who have students with disabilities in their classrooms frequently draw attention to their need for appropriate technical assistance with special needs children (National Council on Disability, 2000a). College instructors who employ web-enhanced instruction express similar needs. They frequently bemoan the lack of ample support staff to help develop

courses and the lack of technical support once the semester has begun (Berge &

Muilenburg, 2000; U. S. Department of Education, 1997b).

Personnel remain largely inadequately trained; however, frustration levels

escalate with the realization that because funding is scarce, and students must be

accommodated by law, within the bounds of the schools' budgets, their training is put

aside in deference to more immediate compliance issues. Further perspective may be

gained by examining organizational challenges posed by the introduction of federal

mandates for accommodation.

Serious problems arise when administrators either purposefully or unwittingly

employ situational interpretation of the law. All too frequently, studies focused on

common education's struggle with PL 94-142 implementation cite prevalent confusion

and lack of coordinated efforts. Sometimes the lack of consistent approach to compliance

stems from individuals receiving interpretations of interpretations of the requirements of

the law (Sarason, 1996; Sivage, 1979; Zigler & Muenchow, 1979). At other times,

discrepancies stem from opposing perspectives (Marmor, 1983) and from a genuine

misunderstanding of who remains responsible for what (Rumble, 1979). Some school

administrators apparently chose their own creative interpretation of the law by meeting

only the minimal standards necessary to pass muster. In higher education, similar

situations abound.

One commonly cited issue for inconsistent compliance is the lack of shared vision

for distance education (Berge & Muilenberg, 2000), which could loosely be construed as

multiple interpretations of what is important and includes setting priorities for purpose,

direction, and growth. The distribution of information proves equally troubling as there

seems to be some question about exactly what and how much university educators and instructional technology directors actually know about what they should be doing for students with disabilities who use adaptive aids in web-based courses.

Furthermore, accrediting agencies' standards for excellence, such as the Higher Learning Commission's (2002) "Best Practices for Electronically Offered Degree and Certificate Programs, place a much higher priority on quality of instruction and assessment of student learning than they do on accessibility issues. Though disabled students' ability to access campus services and information is mentioned in the document as one area to be monitored by the organization in future accreditation visits, it is currently much lower on the list of priorities than student learning and instructional assessment. The Higher Learning Commission's Best Practices benchmarks first appeared in 1999 and have yet to be assimilated into standard practices for visitations. While they do now require that colleges and universities meet the needs of students who participate in distance learning opportunities, assessment of accessibility for students with disability does not remain a high priority.

With PL 94-142, some school personnel expressed serious concerns that support for educating all handicapped children would wane as federal resources dried up (Hoffman, 1983). There was also concern that small disconnected groups gained little ground because they were nationally unorganized and frequently covered the same legislative territory (Hoffman, 1983). Marmor (1983) expresses similar concern in that at that time, organized constituent support for children's issues, such as mandatory free and appropriate education for all handicapped children, was weaker than other advocacy groups such as labor unions because the subject of disabled children did not remain at the

front of people's minds nationwide. The situation with students with disabilities in higher education seems similar.

Until the last few years, little has been published that covers colleges and universities' responsibilities regarding college students with disabilities and technologically enhanced curriculum. Even though laws exist that mandate compliance, there are few strong advocacy groups. The vast majority of people with disabilities who use adaptive aids would benefit from the minority of students in similar circumstances if compliance were persistently enforced. According to Rothstein (2000), the lack of sustained, systematic judicial attention to ineffective compliance contributes to the lack of progress.

Another commonality in the effort to education all students with disabilities is ineffective oversight. Early studies of the implementation of PL 94-142 consider the law a failure for several important reasons. First, some criticize the effort because it failed to effectively anticipate attendant issues with the new regulation (Brewer, 1983). Brewer finds fault because the law emerged only after the problem had escalated to a remarkable degree, and due to its inefficient monitoring systems, inevitable fall-out interfered with intended results. If only lawmakers had had enough foresight to anticipate problems, Brewer argues, implementation may have been smoother and more effective. Others find greater fault with local and state support systems (Hoffman, 1983; Rumble, 1978).

Researchers seem perpetually disappointed in the lack of systematic state and district support, which necessarily renders federal efforts less than effective. Part of the problem associated with weak support is the lack of systematic compliance. In fact, some

claim little oversight from any agency (Marmor, 1983) to the point that schools "exercise substantial discretion in setting work priorities" (Weatherley & Lipsky, 1977, p. 171). Higher education institutions face similar issues. While legislation exists, compliance monitoring for web accessibility is essentially non-existent unless and until students lodge complaints.

To complicate matters, there is no user-friendly recourse that includes low or no-cost litigation option for complainants. Even then, cases are heard on a case by case basis, so the precedent is literally set as the cases occur. Because each case can be so widely divergent, due to individual nuances with illness and the consideration of any number of factors, it appears that more general precedent cannot be set otherwise. As a result, progressive federal policy develops at a painfully slow rate and remains unbelievably inconsistent nationwide (National Council on Disability, 2000b). The National Council on Disability's 2000(a) report covering nearly 30 years of PL 94-142 compliance efforts sums oversight issues for common education: "Federal efforts to enforce the law over several administrations have been inconsistent, ineffective, and lacking any real teeth" (p. 5). Their findings after nearly three decades of trial and error led to the creation of a new oversight agency, Office of Special Education Programs in order to enhance compliance and produce better results. My hope is that is will not take higher education quite so long to make appropriate reforms to distance education practice.

While web-based distance education has successfully provided millions of higher education students with educational opportunities they would not otherwise enjoy, it poses serious problems for college students with disabilities, many of whom use assistive technology. Lawmakers, however, could not anticipate dramatic technological advances in telecommunications and computer capabilities with Section 255. New accessibility issues include the inability to transmit or receive complex Internet files and poor screen resolution (Pattison, 1999), particularly if sites use large or detailed graphics.

Because adaptive technology frequently lags years behind mainstream technology (Coombs, 1995), existing assistive devices are ill equipped to handle complex modern computer applications and image patterns. More serious issues involve inconsistencies among software platforms and the reliability and stability of products and services for people and students with disabilities who use adaptive technology to conduct transactions and retrieve information. Specifically, computer programs and software platforms are not designed with the disabled user in mind.

Distance education is now a major force in higher education's efforts to provide educational opportunities for students independent of location. According to the National Center for Education Statistics (2000), all but 9% of public colleges and universities offer some form of web-based or web-enhanced instruction, and a minimum of 62% of public two-year colleges and 78% of public four-year universities plan to continue offering web-enhanced courses (U. S. Department of Education, 1999). An estimated 49,690 undergraduate for-credit courses, most of which are considered general education

courses, were offered in the United States by public two-year and four-year colleges

during the 1997-1998 academic year (U. S. Department of Education, 1999). Types of

courses range from one-way and two-way interactive video, one-way and two-way audio,

computer-based, and Internet driven courses (U. S. Department of Education, 1997a).

A 1999 survey reveals that more than 1.5 million students enrolled in some form

of distance education course (U. S. Department of Education, 1999). Aside from

traditional distance education courses, 59% of instructors require the use of email in their

courses, and 30.7% instructors have a web page for their course, which students are

required to visit (J. Witherspoon, personal communication, July 9, 2001). Ninety-eight

percent of colleges and universities surveyed enrolled students with disabilities, 69% of

whom required readers or class note takers, 58% of whom required adaptive technology,

and 45% of whom requested interpreters (U. S. Department of Education, 2000).

During their courses, students with disabilities may be required to conduct

research using the library online. The Office of Civil Rights has already determined that

college and university libraries must provide the same electronic access to patrons with

disabilities as they do without (Coombs, 2002; U. S. Department of Education, 1997c).

Students may also be required to navigate their college web site, which supply a wealth

of information from news updates to class schedules to transcript information.

In a random sample of 400 college web pages, the first page was tested for

accessibility using Bobby, a web page validator, which reveals accessibility errors and

prioritizes the severity of the errors for web developers. The result was that 22% of the

first page was Bobby-approved, but only 3% of the second level pages, pages found by

following a link from the home page of the college, were Bobby-approved or had low

priority or no errors (Coombs, 2002). One year later, 24% of the first level pages, or home pages, were accessible. This suggests two things. Even under scrutiny, colleges and universities are slow to improve their accessibility rating, and at that, the improvement is superficial. In other words, only the home pages improved. The second level pages, those accessed by following links from the home page, did not improve, which suggests that efforts toward accessibility were a gesture at best. Rowland and Smith (2000) conducted a similar study two years earlier with similar results. Schmetzke (2001) conducted a similar study with only slightly better results. His study also included 12 sites for national organizations that support distance education, which had low accessibility ratings of 18%. Those who have surveyed federal sites with similar instruments have gleaned similarly disappointing results (Ellison, 2004; National Council on Disability, 2001).

The most pressing issue is that the more technology colleges and universities allow their web-enhanced courses to incorporate the greater the risks for further excluding students with disabilities in higher education. To highlight the importance of higher education's timely response to these issues, current students with disabilities who graduate from high school are better academically prepared for college than ever before. These students, because of their experience with PL 94-142, are more likely to insist on appropriate accommodations in college and formally complain when appropriate accommodations are not granted (Rothstein, 1997b). The combination of an increase in higher education enrollment by students with disabilities and higher education's unprecedented growth in distance education offerings using web-based instruction creates significant cause for concern.

Current distance education research does not indicate that serious attempts to accommodate college students with disabilities in web-based courses are being made. Instead, most research focuses largely on issues of quality and instruction. Kim-Rupnow, Dowrick, and Burke (2001) comment that we also do not know whether students with disabilities are gaining access to distance education because we do not have a clear idea of who makes up these potential constituents and how to reach out to them.

One main strand of the literature focuses on instructional issues such as creating and maintaining social asynchronous and synchronous environments conducive to learning, most specifically with regards to instructor/student contact (Carr, 2000; Gunawardena & Zittle, 1997; Hillisheim, 1998; Smith, 1998). Other strand of literature showcases best practices in distance education (Smith & Dillon, 1999; Whitworth, 1999; Willis, 1998). Extant best practices research offers course management suggestions including tracking student participation, handling e-mail traffic, and keeping students engaged and on schedule with assignments. Still others investigate quality control in distance education endeavors. Researchers' greatest concerns are that web-based courses maintain the same integrity of their on-campus counterparts in terms of type and number of assignments, difficulty of material covered, and comparable amounts of student engagement in activity (Harris, Harris, & Hannah, 1998; Tweney, 1999). The overwhelming majority of research on web-based courses falls within one of these three categories.

While substantial research does exist regarding issues of access, the focus is almost exclusively on those who are denied access for socioeconomic or geographical reasons. Specifically, a great deal of attention has been paid to those, such as the poor,

minorities, and rural students, without access to computers (Gladieux & Swail, 1999; Koch, 2000; Mollison, 2001). Researchers' arguments are that the cost of equipment and the lack of Internet access, either because of cost or location, keep these and other students from participating in what could be educationally enriching experiences.

Far less attention, some of which is quite dated given technological advances (Coombs, 1995), is paid to site construction as a barrier to participation for students with disabilities, and those researchers tend to focus on issues with access to graphics and more cumbersome design issues such as frames and tables. Other research focuses exclusively on access to students with disabilities in public schools, but its coverage of pertinent access issues remains incomplete (Fine, 2001). Finally, there is very little evidence in the literature to show that colleges and universities formally prepare course designers for the magnitude of accessibility issues students with disabilities currently face. One study notes that textbooks mention accessible design as an afterthought. A survey of three popular books used in modern classrooms for teaching web design reveals less than a page of discussion devoted to this topic (Oravec, 2002). Some believe that is precisely where fundamental change must begin (National Council on Disability, 2000b).

The current number of students with disabilities in higher education and colleges and universities' slow response to their need to fully access campus web sites with adaptive technology calls for increased attention to issues of accommodations. An assessment of current practice is especially important because recent research shows that one out of every 11 college freshmen in the United States has at least one diagnosed disability (Rothstein, 2000). According to the National Center for Education Statistics (1999) 37% of students surveyed have verified speech/language disabilities, 54% have

73

visual difficulties, 35% are hard of hearing, 28% are deaf, and 31% have orthopedic

disabilities that require accommodations.

Another study two years later by the Office of Education Research and

Improvement (U. S. Department of Education, 2000) shows that 98% of those students

with disabilities are enrolled in two and four-year public institutions. In spite of the

increase in the number of higher education students with disabilities and the existence of

federal laws to help guarantee equal access for them, the laws have been only marginally

successful (Konur, 2000). In order to effect real change, the perspectives of lawmakers

and enforcers must change as well (Konur, 2000).

Chapter Summary

This chapter provided an overview of organizational theory with a specific focus

on social systems theory and loosely coupled systems theory. Another strand of literature

discussed disability studies in order to paint a backdrop for the study by distinguishing

between inclusion and exclusion and separating disability from impairment. A third area

of the literature concentrated on relevant federal legislation followed by a closer look at

Office of Civil Rights rulings and higher education. Our attention turned next to policy

implementation theory with an examination of barriers to implementation and the concept

of street-level bureaucrats. Near the end of the chapter, equal access to information

technology was explored with a special emphasis on universal design. The chapter ended

with a look at higher education, distance education, and college students with disabilities

in distance education courses.

Chapter III

Procedures and Data Presentation

This chapter includes a discussion of study procedures and discussion of data gathered during the study and instrumentation used during the study. This chapter also discusses the principles of data organization, management, and analysis used during the study.

Case Study Approach

Case studies are qualitative forms of research good for examining subjects in depth. They allow a researcher to systematically examine a group or groups via comprehensive collections of data full of meaning (Creswell, 1998). Yin (1994) defines a case study as follows:

1. A case study is an empirical inquiry that
   · investigates a contemporary phenomenon within its real-life context, especially when
   · the boundaries between phenomenon and context are not clearly evident.

2. The case study inquiry

- copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result

- relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result

- benefits from the prior development of theoretical propositions to guide data collection and analysis. (p. 13)

I sought to understand the thoughts and actions of college and university personnel responsible for web-based courses regarding ADA compliance, particularly as it applies to students with disabilities who assistive technology to access their asynchronous web-based courses. I sought to determine the degree to which those who design and create distance education courses are aware of accessibility mandates and what, if anything, they do with that knowledge in terms of course design to facilitate access. Instructional technology directors, instructional technology supervisory personnel, above and below the instructional technology director, plus likely cooperative constituents were deemed integral data sources.

The case study format offered a logical avenue for this project. The form of the study is an instrumental case study, described by Creswell (1998) as one which uses a case, a program, event, or example bound by place or time, to illustrate or highlight a particular issue. Anderson (1998) goes one step further to define the purpose of case studies as studies of "how things happened and why" (p. 153). In this study, the focus is on what the players knew and what they did with the knowledge they had. I also looked carefully at how various groups on campus interacted with each other. Later, I compared

what happened on one campus to what happened on other campuses for insight. Creswell calls a study that uses more than one case a collective case study. Because the study uses four school sites, two from two tiers in the same state, to explore the same issue, it would be fair to say that this study is a collective instrumental case study.

Multi-site case studies prove valuable for several reasons. They "build a general explanation that fits each of the individual cases, even though the cases will vary in their details" (Yin, 1984, p. 108). Orum, Feagin, and Sjoberg (1991) believe case studies hold intrinsic value. Because they offer an in-depth view of a case or cases, case studies allow researchers considerable insight into participants' drives, which helps us understand motivation in general. Case studies can also lend considerable understanding with regard to historical sensibilities. Finally, Orum, Feagin, and Sjoberg think case studies remain valuable because of their ability to generate theory and the ability for researchers to draw conclusions from them.

A few things to be concerned about during case study research include evidence, validity, reliability, and transferability. Anderson (1998) notes the seven types of possible evidence used in case study research: documentation, file data, interviews, site visits, direct observation, participant observation, and physical artifacts. This study uses three of the seven. I conducted personal interviews with 19 participants and two pilots. Two interviews of the 19 had two individuals each present for a total of 23 interviews. I also visited all four sites multiple times. I conducted each interview at the campus of the participant. I used documents from each campus, including documents I retrieved myself and documents participants gave to me.

Because college systems are complex and the logistics of offering even one distance education course involves several offices, particularly when students with disabilities are involved, data needs for this study were varied. Simple data needs included contact information for university personnel, campus policy information regarding distance education courses and offerings for academic year 2003-2004, and university policy information regarding accommodations for students with disabilities who rely on adaptive technology. This information was obtained from campus personnel, web sites, catalogs, student handbooks, and student disability administrators' office.

Other information needed fell in four broad categories: student demographic information, information regarding campus locations where students with disabilities who use adaptive aids may access the Internet, information regarding distance education course design and construction, and information about how knowledge regarding compliance initiatives is communicated. Information in the first two categories was objective and was obtained from the colleges' web sites or catalogs or brief conversations with college personnel. Information was also gleaned from annual reports submitted to the Southwest State Regents for Higher Education. The last two categories of information, web course design information and information regarding communication patterns, are more subjective.

Additional information collected from campus web sites includes statistics on enrollment, online offerings, ADA accommodations, and ADA services. Catalogs and other documents, such as local papers and flyers from the distance learning office, were

gathered from all institutions. This information was used to further inform the data gathered from interview candidates.

Sample

Given the lack of accessibility by colleges and universities in the face of clearly delineated mandates for web-based initiatives, this study looked at two schools from two of the higher education tiers, regional and two-year colleges, in the same state. The target population for this study was limited to four purposefully chosen institutions. These four colleges were chosen among their peers in each category based on two criteria: 1) the percentages of student populations with the following disabilities that are more likely to require assistive technology to access asynchronous online courses: ortho/mobility, deafness, visual, and brain injury, and 2) the number and variety of distance education courses offered. The study excluded both comprehensive universities in Southwest because the regional and two-year institutions fit the criteria better than the comprehensive institutions on both points of interest.

The actual sample was determined in two ways. The first determination was made given information regarding disabled student populations gleaned from the state regents' report of students served in all of Southwestern higher education institutions (SRHE, 2002). The second determination was made after an informal survey of Internet course offerings of all state colleges and universities for the 2003-2004 academic year using the institutions' online schedule for the same year.

Interview Protocol

The interview protocol in Appendix A lists the set of questions posed to all interview candidates. To determine the degree to which organizational issues affect compliance on each campus, I needed to learn about the participants' experience with web accessibility issues for students with disabilities who rely on adaptive aids. I also needed to learn the processes by which information regarding compliance initiatives is communicated and how often accessibility issues are raised and how they are addressed. This information can only be obtained through personal interviews.

Data Collection

Before data collection could begin in fall 2003, entry at each institution was negotiated with the appropriate administrators. To facilitate this process, I presented to the appropriate administrators letters of entry that identify the purpose of the study and delineate proposed activity on campus should permission be granted (see Appendix B). One institution asked for a summary of my proposal, and another required approval of their internal review board before granting permission to conduct research on campus. Once approval was granted at each school, I approached instructional technology directors and other key campus personnel, such as ADA coordinators, web administrators, and others with similar letters of entry (see Appendix D). Formal interviews were conducted with 19 people. All initial interviews were conducted on research campus sites according to the interviewees' preferences. Follow-up interviews

were conducted, as they were deemed necessary, by phone and email. Upon gaining

entry, I gave all participants a one-page summary of the study framed for general readers.

They read and signed an informed consent document that contained my contact

information, granted their permission to participate in the research activity, granted or

denied permission to be audio taped (see Appendixes C and E). They received their own

copy of this signed document, which I co-signed. They were also notified that they had

the option to cease participation at any time. All participants were guaranteed that

identities and school affiliations will be protected at all times during the study and in all

references made in the final document.

Initial pilot interviews included two instructional technology directors from

campuses not included in the study. One individual was someone I know very well, and

the other was unknown to me. The pilot interviews gave ample fuel for thought, as both

individuals possessed ample experience with web accessibility compliance issues both in

higher education and in business and industry. Our discussions prompted the reordering

of the interview protocol and the rewording of one question for clarity. Both tasks proved

fruitful as subsequent interviews felt more natural, and subsequent conversations flowed

better. Both interviews also confirmed that interviewing around the instructional

technology director, as suggested by my dissertation committee, to include other key

campus personnel, such as ADA coordinators, web administrators, instructional

technology directors' supervisors or those who work for them, and other similarly

situated individuals, would prove very fruitful.

Later interview candidates were determined three ways. Campus personnel do not

act alone in their quest to provide web course access for students with disabilities.

Instructional technology directors frequently work with any number of people to do their work. Sometimes they coordinate efforts with web administrators, technology specialists, and their own supervisors to do their work. Sometimes, though more rarely it seems, they work with ADA specialists to open the world of possibilities for students whose worlds are sometimes limited by lack of forethought and planning. The original intent of this study was to investigate the work of instructional technology directors alone. It was clear from the beginning of the study that, like most people, instructional technology directors rarely work alone. The scope of the study was broadened to include personnel such as those mentioned above since their decisions all affect the degree of web course access afforded to students with disabilities by higher education institutions.

Overall, access was freely granted with few exceptions. All institutions but one allowed free access to all campus personnel and resources. Only one insisted that I work through the office of the vice president for academic affairs (VPAA) for contacts with all campus personnel. While this may seem restrictive compared to the other institutions I visited, the VPAA kindly suggested an individual who was not on my list of potential interview candidates, though this person was mentioned by others as a good source of information about web accessibility. Individuals were purposively selected for interviews based largely on their position at the institution in relation to the instructional technology director, who was always contacted first for an interview. Whomever this person recommended for an interview was very often considered a likely candidate for consultation. In fact, one interviewee, who turned out to be highly informative, was mentioned in an interview. I would otherwise never have known about or considered this individual as a potential candidate, and it would have been a significant oversight.

Initial personal interviews with instructional technology directors or other responsible parties occurred on the research sites according to the individuals' preferences during the fall 2003 and spring 2004 semesters. Follow-up interviews were conducted as the data analysis called for them. They were conducted by phone and email according to the interviewees' preferences. Several interviewees expressed their willingness, even preference, to correspond via email because of their busy schedules. All interviews were tape recorded since all participants' consented. I used some descriptive field notes to capture the flavor of each institution's environment. In these descriptions, I include elements of non-verbal communication, the immediate environment, interruptions and reactions, other people, and their interaction with us if we are in an open area. These and other details provide the description necessary to render a reasonably textured picture of each situation.

Validity

Validity seems a particular concern in case studies. To address issues of integrity, a few select members of my doctoral cohort from OSU Stillwater periodically reviewed my data analysis process. To address questions of validity in my interpretation, I relied on multiple methods of data sources, collection, and analysis and an audit by peer researchers. Audits scrutinize the viability of the researcher's process and methods, and auditors pose questions such as those developed by Schwandt and Halpern (as cited in Mertens, 1998). For this task, I asked my small group of cohort members to ask themselves the following questions while reading the study:

1. Are the findings grounded in the data? (Is sampling appropriate? Are data weighted correctly?)

2. Are inferences logical? (Are analytic strategies applied correctly? Are alternative explanations accounted for?)

3. Is the category structure appropriate?

4. Can inquiry decisions and methodological shifts be justified? (Were sampling decisions linked to working hypotheses?)

5. What is the degree of researcher bias (premature closure, unexplored data in field notes, lack of search for negative cases, feelings of empathy)?

6. What strategies were used for increasing credibility (second readers, feedback to informants, peer review, adequate time in the field)? (p. 354)

The answers to these questions should be adequately addressed in the remaining chapters of this dissertation.

Additionally, Mertens (1998) recommends conducting periodic "member checks" with people who are part of the study's research group to determine where differences in "viewpoints may be based on culturally different interpretations" (p. 355). Because I know two instructional technology directors at schools not included in the study, I asked their assistance in testing ideas and theories. Asking others, such as a few of my cohort member and my committee chair, to test ideas and theories throughout the analysis process provided what Denzin terms theoretical triangulation (as cited in Stake, 1995, p. 113).

The methodology of the study was triangulated through the use of multiple methods of data analysis, which included, but was not limited to, observation, document

analysis, and participant interview where participants were requested to member check transcripts for accuracy. Only three study participants took advantage of the opportunity to member check transcripts for accuracy.

Reliability

Yin (1984) advises researchers to conduct themselves as though "someone were looking over [their] shoulder[s]" (p. 40). This was good advice, as it helped me create a system that could be used by others to come to the same or similar conclusions about the institutions studied in this collective instrumental case study. Yin maintains three critical steps will help with the problems of "construct validity and reliability of a case study" (p. 89). The principles include 1) using multiple sources of evidence, 2) creating a case study database, and 3) maintaining a chain of evidence. Having already discussed the types of evidence used in the study, I turn to the management of data.

To keep data organized in such a way that others could easily retrieve it, I created a case study database. The transcribed interviews created over 300 pages of raw interview material to work with, and data management was a problem. I also had several types of memos to work with during the data analysis process: pragmatic memos, analytic memos, reflective memos, and incident memos. Pragmatic memos proved useful for recording practical decisions, such as what quotes to include/exclude, decisions about which locations on campus to visit, and more, during the data analysis process (Miles & Huberman, 1994). These types of memos proved useful in the tracking of decisions, some of which I questioned at a later date; a written record of the decision and rationale saved

time and energy. Other memos include analytic memos, which are used to plumb the research data for meaning (Miles & Huberman, 1994; Schon, 1987). In an analytic memo, only one aspect of the encounter was analyzed, but I sometimes introduced other information, such as similar or contradictory incidents or literature, to help me understand the incident. Analytic memos were used, in addition to coding, during all stages of data analysis in their various forms to help me think about and look for common threads, contradictions, and emergent themes.

The memos were kept in a notebook, arranged according to type and by the date they were written. They were later analyzed for recurrent themes as the project has taken some time to complete. The notebook also contains a section for each institution where memos were stored on any given topic during the analysis process. These are also stored by date and were later analyzed for recurrent themes. Other materials pertinent to each interview subject were kept in a separate file in a separate location accessible only to me. These materials were later translated into several stages of data displays, in increasing degrees of generalizability, which were stored in the same location accessible only to me. This "chain of evidence" should be traceable by another researcher should someone wish to follow it.

Transferability

Lastly, some may find transferability problematic with case studies. However, because this is a multiple case study, there is a greater wealth of evidence from which to draw conclusions, which makes the multiple case study stronger (Yin, 1984). To increase

the transferability of case studies, Merriam (1998) recommends three strategies: offering "rich, thick description . . . [showing] typicality or modal category . . . [and using] multisite designs" (p. 211-212). During the course of interviews and brief observations, I gained sufficient information to provide the kind of rich, thick description necessary to make comparisons between cases, the kind that would demonstrate to readers whether their site(s) are similar or not. To address the issue of demonstrating the average site, I believe the comprehensive literature review paints a good picture of the state of affairs in accessibility in distance education in higher education. Because the study's purpose is to look at how colleges and universities within the same system address the same problem given the same guiding directives, I believe the end result will ultimately be more useful to readers than not.

Summary

This collective instrumental case study used a purposively chosen sample. The research design used qualitative data collection methods to discover what, if anything, college and university personnel are doing to accommodate students with disabilities who use assistive technology in online classes. This chapter explained methods used to ensure validity, reliability, and transferability. Chapter IV describes the data analysis. Chapter V offers final commentary, lessons learned from the study, and implications for further research.

Chapter IV

Analysis of the Data

Social systems and policy implementation theory serve as the analytical lenses in this study. They are used to explore what colleges and universities are doing to increase asynchronous web course accessibility for students with disabilities who use assistive technology. The discussion in this chapter helps address the research question: What are designers of web-based distance education courses doing to accommodate adaptive technology aids for students with disabilities? Analysis focuses primarily on social systems theory, especially notions regarding roles, loosely coupled systems, and policy implementation theory to explain what is happening in the included institutions and among the participants.

Data Organization, Management, and Analysis

My initial plan for data analysis was that it would be an ongoing synergistic process over time. That was not always the case, particularly in the beginning. It became immediately apparent that I would not be able to transcribe my own tapes as I quickly fell behind in the interview-transcribe-analysis cycle. As a result, I found a licensed medical transcriber to transcribe the remaining interviews for me. Because she is bound by the

ethics of her profession, I felt comfortable enlisting her services. I proofread each transcript as it was returned to me by listening to the tape along with the transcript and correcting any transcribing errors. I made corrections by hand on the printed transcripts and made copies of all transcripts, over 300 pages, to store in a safety deposit box since I live in a region often stricken with tornadoes.

My initial analysis plan called for informal analysis of interview transcripts and interpretation of incidents from each case within the collective case study (Stake, 1995). Observations and hypotheses were to be made after contact with research subjects without conducting formal analysis. I had planned that the majority of the data analysis would be more formal in that I would look for patterns or inconsistencies among the institutions under study. Later formal analysis would include coding text, including transcribed interviews (Creswell, 1998; Mertens, 1998; Stake, 1995) with the purpose of fleshing out themes suggested or revealed by the research data (Mertens, 1998; Miles & Huberman, 1994). Formal analysis would continue as new research material is folded in as consistencies are affirmed or outliers appear. Data analysis would be especially open to *emic* issues, research questions or issues suggested by the subjects themselves (Stake, 1995). This is a critically important consideration, as such insight can prove invaluable and quite illuminating. I would consult the literature to reaffirm hypotheses or help explain anomalies. Data analysis would conclude when the data analysis revealed no new information (Miles & Huberman, 1994).

In reality data analysis occurred differently. Analysis decisions were driven mainly by my work constraints and trying to minimize the amount of time away from

campus. Instead, I concentrated on data gathering earlier in the process, with informal

data analysis, and I planned formal data analysis later.

I used several types of memos, reflective, analytical, and pragmatic, during this

phase of research to help with data analysis. In *Educating the Reflective Practitioner*,

Schon (1987) describes types of reflection, knowing-in-action and reflection-in-action, as

critical means by which students and professionals know or understand their

circumstances in order to improve practice. Of knowing-in-action, Schon (1987) says that

while we cannot always articulate when "it," whatever "it" happens to be, is "right," we

are more able to describe "it" when it is not quite right. Reflective memos focused more

on my processes of analysis, thinking, and progress than the design or content of the

study. Incident memo documented shifts in process, direction, or thinking whereas

analytical memos helped track lines of thought. All memos regardless of purpose and

form were dated, have one general topic, and were appropriately filed.

I relied mostly on Yin's (1984) recommended methods of data organization,

which were described earlier. Briefly, Yin endorses three principles of good data

collection: using multiple sources of evidence, creating a case study database, and

creating a chain of evidence. Throughout the study I collected many types of evidence

other than the main source of evidence, which were the interviews. To illustrate, I

collected college catalogues, campus newspapers, printed schedules, pages from campus

web sites, and materials from various campus offices I visited describing services

provided. This information was considered along with other data to illuminate

observational insights and the interviews. I also obtained raw data from a state study on

web accessibility for all state agencies and observed each time I visited each campus.

Next, I created a case study database that is accessible by others. According to Yin (1984) "case study notes must be stored in such a manner that other persons, including the investigator, can retrieve them efficiently at some later date" (p. 93). Files for all interview participants include transcripts of our interview and my notes, all files for each campus, and data maps for each interview are color coded by institution and respondent, labeled, and stored in a secure location. Memos of various descriptions, analytic, reflective, and pragmatic, for example, are kept in a separate notebook for that purpose, and the notebook is also labeled. The notebook has a separate section for memos for each institution as well.

When I began reading transcripts I coded all transcripts using their own words with the hope of fielding ideas that fit the data (Strauss, 1987). I coded all files in this manner. I asked my transcriber to number the lines of the interviews and leave a wide margin on both sides of the text where I would write. I read each interview multiple times and wrote phrases of one to a few words and then made rough data displays, which is a practice recommended by Strauss (1987) and Miles and Hubermann (1994) because data displays help writers observe relationships in their work. I documented the rough data displays with line references that tie back to the actual interview document.

During this process, I continued to write analytical, reflective, and pragmatic memos. The purpose was to record decisions and events during the process, my thoughts about subjects, and various hypotheses regarding the study as they occurred.

Once data displays for all participants were complete, I went back through the data displays for all participants for that college or university looking for patterns or commonalties. I narrowed down the scope of codes to those that seemed to "relate to the

core" of the study (Strauss, 1987). I was sensitive to *emic* issues, issues suggested by the

respondents themselves (Stake, 1995), but *etic* matters, more general constructs, played a

significant role in the presentation of the final analysis. The lens of my theoretical

perspective framed this decision. After determining the final themes for the study, I went

back to the rough data displays for each interview and the interviews themselves. I

labeled new data displays for each participant using the themes that had emerged from

the first round of analysis. I then coded each interview again with those theme headings

in mind and completed new data displays.

After each new theme oriented data display was complete, I created Excel

spreadsheets and entered the material from the data displays for the purposes of clear

comparison. I then created an analytical memo for each respondent. In the memo, I made

at least 5-7 analytical statements about that individual given the information that emerged

from the display. I then commented on the analytical statements and any other thoughts

that came to mind. Once I completed displays and memos all respondents from an

institution, I made a comparative memo with all respondents on each thematic point.

Miles and Huberman (1994) note the importance of this within-case analysis as being

able to gauge the situation for what it is, "what is going on and how things are

proceeding," as a critical step before analyzing why things occur as they do. Line

references to interviews were retained and participants' words and phrases were used, but

the categories and themes at this point were my own words.

Next, I conducted a cross-case analysis using the various memos, Excel

spreadsheets, and data displays. As themes sharpened from those that I had suspected in

earlier analysis, I tested them for validity and plausibility by going back to the theoretical

92

perspectives that guided the study, social systems and policy implementation theory, and the literature review for confirmation. Data analysis concluded when no new information emerged.

See Appendix F for a presentation of the raw data, which includes a comprehensive table outlining the all participants, their positions, and the institutions where they work. Appendix F is divided by institution and presents the participants' experiences using their own words.

Analytical Lenses

Social systems theory (Bertrand, 1972; Gaynor, 1998; Kast & Rosenzweig, 1996; Katz & Kahn, 1996) is the lens I used to explore the behavior of participants with regards to existing policy. Gaynor (1998) says that one purpose of social systems theory is to explore people's actions in their job while considering the "interaction of culture, organizational, psychological, and physiological factors" (p.55). Loosely coupled systems theory (Weick, 1976) is useful for examining these features as well. The aim of social systems theory is to study human behavior in the context of organizations considering the intersections among an institution's social, structural, cognitive, and physical orientations (Gaynor, 1998).

According to Bertrand (1972), there are six structural elements of social systems: from smallest to largest element, there are norms, roles, status-position, situs, station, and subsystem. Of the six, only role and subsystem prove relevant to this study. Roles come from an adopted set of actions expected of all people representing a role in any particular

working relationship (Katz & Kahn, 1966). In the study, roles can be seen as what the respondents and others expect of that particular position. Subsystems play a critical role because they constitute the institutions or organizations in which the roles are played out.

Bertrand goes on to say that several roles (smaller parts) might be involved in the status-position (larger whole), depending on the level of position in the social system, CEO of a company, for example. Not surprisingly, many of the respondents hold several roles in their respective institutions, but few hold prime positions of real authority. Finally, the subsystem is a single institutional unit, such as a university or a church that is comprised of a solitary entity. One important element of social systems theory includes the relationships that occur in and among these groups, particularly among the roles. The relationships or lack thereof, among groups at each institution were examined carefully.

Katz and Kahn's (1996) approach to systems theory relies on a combination of macro and micro approaches, and they adhere to the philosophy of open systems theory, which means that there is a continual influx of energy to sustain the work of the system. They also believe that roles are the foundation upon which systems are built (Katz & Kahn, 1966). A few key parts of their theory are important to this study. Role behavior also plays an important role because it refers to the repeated performances of an individual. Finally, role conflict plays a significant part in the study and is defined by Katz and Kahn (1966) as what happens when competing requests for changes in behavior are made for the same individual at the same time. Granting either request would make it difficult to comply with the other. Essentially, the employee is stuck in a very difficult position.

Gaynor (1998) addresses the issue of role conflict in his discussion of role

expectations, multiple role conflict, and sources of role stress. The difference between

generally prescribed functions and reality, should any exist, constitutes the difference

between role and role expectation. Additionally, multiple role conflict, which Gaynor

claims is produced from competing demands placed on the position by numerous other

positions, is not at all uncommon. Examples of role stress include competing demands,

such as time and money. Other sources of role stress to be closely examined include the

lack of ability to meet the demands placed on them and the lack of clarity of expectations

(Gaynor, 1998). A considerable amount of time was given to analyzing the issues

regarding roles, coping strategies with regards to work relationships, and job stressors

mentioned here.

Loosely coupled systems present another analytical lens used for the study. Some

people believe higher education institutions function as unified, well-oiled machines with

all efforts pulling in the same direction, but most people who work in them know

differently. Daily business is rarely neat, particularly in education. In contrast to the

neatly divided and fully autonomous entities that some entities inside educational

institutions would like to see themselves, Weick (1976) describes a loosely coupled

system where groups are loosely coupled based on the number of variables and the

frequency of contact the groups have in common. Weick (1976) finds loosely coupled

systems present in particularly in educational organizations in 15 different ways, several

of which have direct bearing on this study:

(3) richly connected networks in which influence is slow to spread and/or is weak

while spreading; (4) a relative lack of coordination, slow coordination or

coordination that is dampened as it moves through a system; (5) a relative absence

of regulations; . . . (9) infrequent inspection of activities within the system; [and]

(10) decentralization. (p. 5)

According to Weick some of the benefits of loosely coupled systems include the ability

the preserve themselves and adapt to new situations. The potential drawbacks seem

obvious. Depending on the situation, the lack of coordination or oversight could be costly

or dangerous. In this study, one or more components of Weick's loosely coupled systems

were clearly present at each institution studied.

Another lens used for analysis is policy implementation theory, particularly that

found in policy evaluation research (Berman, 1978; Hargrove, 1975; Lipsky, 1969;

Lipsky, 1980; Van Meter & Van Horn, 1975; Weatherley & Lipsky, 1977). Policy

evaluation research looks to the implementation of policy as the root of issues with the

policy. Because this study looks at college and university personnel as implementers of

existing policy, it seemed necessary to consider policy implementation theory as a useful

lens.

Policy implementation can be defined as acts by people or groups for the purpose

of attaining a set of predetermined goals that were set forth by law or public policy (Van

Meter & Van Horn, 1975). Van Meter and Van Horn go on to say that the study of policy

implementation looks at those things that help or hinder the attainment of program goals.

Policy implementation studies began because theorists realized that just because a policy

existed, proper implementation was not sure to follow. Many obstacles stand in the way

of proper implementation, including the agency itself. Other barriers to proper

implementation include the lack of resources, failing funds, and "accumulation of official

and unofficial constraints on behavior" (Van Meter & Van Horn, 1975, p. 453). Each of these barriers manifested themselves to varying degrees in the institutions examined in this study.

Berman (1978), Lipsky (1969, 1980) and Weatherley and Lipsky's (1977) studies of policy implementation are particularly useful for this study. Berman (1978) differentiates levels of implementers, from the macro level (federal) to the micro level (local) implementers and notes that each plays equally important though different roles in the implementation of policy. Weatherley and Lipsky (1977) call the micro level, local implementers "street-level bureaucrats," and it is with them, they claim, that real public policy is made. This concept held true throughout my research. Campuses that were most successful at accessibility initiatives became that way because of individual efforts, not necessarily because of the institution as a whole.

All of the policy implementation theorists mentioned above (Berman, 1978; Hargrove, 1975; Lipsky, 1969; Lipsky, 1980; Van Meter & Van Horn, 1975; Weatherley & Lipsky, 1977) are interested in location and setting as a problem in the implementation of policy, but they also look toward the behaviors of personnel as a key factor. Berman (1978) believes that the policies are only implemented because of the efforts of the "street-level bureaucrats" (p. 20), or the people on the ground floor. He maintains that because of the nature of large organizations, they have enough autonomy and local authority to make or break policy where it meets the public.

Finally, Lipsky first developed the concept of the street-level bureaucrat in 1969. One issue with street-level bureaucrats concerns role anxiety. Lipsky believes the source of role anxiety comes from one of three places: coworkers, people who have similar roles

in the organization, and "reference groups" (1980, p. 142). Several respondents have similar roles on their campuses, and role anxiety was definitely present. I believe it was present in some to such a degree that it prevented them from implementing ADA policies they knew to be necessary.

To deal with role anxiety, Lipsky (1969) believes street-level bureaucrats try to influence those who have authority over their jobs, carry out some portion of their job with some modicum of success even if they cannot be successful all of the time, or modify the group of people they serve. Another option is to develop coping mechanisms, which are often unapproved by the organization (Lipsky, 1980) to deal with the situation. Lipsky found that some street-level bureaucrats exhibited the following behavior: cut back on work, levied authority on constituents, cut back on resources for workers, left the organization, withdrew from their work emotionally, and passed work on without examining it too closely.

Weatherley and Lipsky's (1977) study of coping mechanisms revealed that implementing personnel who develop their own coping techniques may "in the aggregate, constrain and distort the implementation" (p. 171). Weatherley and Lipsky's work focuses mostly on public service personnel such as police officers, social workers, and to some degree educators. The personnel in this study fall loosely under the categories in Weatherley and Lipsky's work but squarely on target for the kind of work they do: public service. Providing access to education for students with disabilities is as much a public service as securing the safety of others or filing paperwork for single families with children.

While Weatherley and Lipsky (1977) focus more narrowly on the implementers as instruments or impediments of change, social systems theorists and organizational theorists such as Hall and Quinn (1983) and Beyer, Stevens, and Trice (1983) analyze the implementing organization's role in policy implementation or implementation failure. Both higher education and common education have little discretionary money in comparison to their general operating budgets which makes implementation and regulation difficult (Berge & Muilenburg, 2000). It is difficult to anticipate the cost of new policy implementation (Weatherley & Lipsky, 1977). However, higher and common education institutions improvise in order to meet the letter of the law as best they can. This sometimes means interpreting the law in ways that cost the least amount of money, yet still remain marginally compliant (Giedosh, 2000; National Council on Disability, 2000a; Rothstein, 2000; U S. Department of Education, 1997b; Zigler & Muenchow, 1979). The lack of institutional resources and creative interpretations of what is required by law were two common topics during interviews with respondents.

An analysis of all four institutions and respondents using the lenses discussed follows. The first discussion focuses on subsystems in institutions, and it examines each institution and its respondents in turn. It is followed by a section summary that includes a comparative discussion of all institutions included in this section. The second section concentrates on policy implementation, and it examines follows a similar pattern.

From interviews with respondents, it is clear that while some progress is being made toward making online course offerings accessible for Southwestern college students with disabilities who use adaptive technology, not enough is being done. In many cases, nothing is being done. The reasons vary, including lack of funding, faculty attitudes, lack of knowledge, and lack of need for such activity until the need arises. The literature clearly shows, however, that the need is there and what the law requires. A discussion of thematic categories that emerged from this study of four higher education institutions in the Southwest, two two-year and two regional universities, as described by the respondents follows.

Roles

According to social systems theory, roles in organizations encompass several elements including a set of expectations for a particular job set and a position in the larger organization (Katz & Kahn, 1966). Several aspects of role theory emerged with notable frequency in the course of data analysis. Role conflict, where respondents received competing messages regarding their role in the organization, and role behavior, commentary about repeated behavior were notable themes. Multiple role conflict and subsystems were also dominant. Multiple role conflict occurs where one individual holds several roles on campus, and there are competing demands placed on that person's resources. A subsystem is a single unit or entity, such as a college or university. Loosely

coupled systems theory will be used to examine specific subsystems as defined by the respondents and their respective schools. A description of each of these with supporting evidence from study respondents follows.

Role Conflict

Most everyone experiences challenges at work at one time or another. Not everyone experiences difficulties that could cost their jobs or are asked to make compromises in the law. In the context of this study, role conflict refers to the idea that one or more people make demands of an individual at the same time (Katz & Kahn, 1966). Yielding to either demand would make it difficult to acquiesce to the other, which means that the individual is in a precarious position. In the instance of this study, the issue at stake is what is to be done to accommodate students with disabilities who use assistive technology in an online environment. The other part of that equation is who is responsible for making those accommodations? The answer was surprising.

Four of 19 respondents received competing messages about their work. Two of the five are instructional technology personnel, and two are student disability administrators. Angela, coordinator of instructional technology and online learning at Community College A, and Anne, web master experienced this phenomenon most prominently. Anne's sole responsibility is to make the web site at the college ADA compliant, "except for the individual faculty pages" and a few department pages. She expends an enormous amount of time and energy making sure the rest of the web site is ADA compliant. However, the faculty pages and a couple of department pages are off

limits to her in spite of the fact that web accessibility is her job. She "wish[es] we could" have all of the areas compliant, but she was told by Angela and others that Angela would handle the faculty side. Her efforts were resented so much in the beginning that she received "hateful email" from faculty in the first year of her compliance efforts, which made her job difficult. She learned that there was a faculty listserv, and several things were posted about her. Her response was that she was just doing what the president asked her to do.

Part of the issue here is that Angela is under enormous pressure from faculty to maintain their autonomy. She knows that the faculty pages should be ADA compliant, but faculty balk at "the amount of time that they may have to put in to make something accessible." The same is true for their pages on their web sites for students. Angela says she has a difficult challenge because "faculty [have] a real concern of having someone tell them how to construct a class." The challenge of having a task of building a quality online program and teaching faculty to design quality courses that are accessible for students without levying undue burden on them poses such a great burden on Angela that her response is to compromise in favor of the faculty.

Denise, disabilities support services coordinator at Regional University D, shares similar experiences with Angela and Amy. Denise was hired as the disabilities support services coordinator after there had been temporary people in that position for 10 years. At the time of our interview, she had held the position for almost two years. When she came to the university, there was no assistive technology, and she claims "nor do I think that they were looking towards purchasing any." As the coordinator, she is supposed to requisition equipment, assess the accommodation requests of students with disabilities as

they come to campus, make arrangements for accommodations in class, and more. She claims she was "met with extreme resistance in the beginning," mostly from other departments, including IT, who thought she was trying to "take over" their departments. She was given a job to do, and in the course of trying to do that job, other forces on campus were pushing hard against her, trying to get her to "lighten up."

Brenda, instructional designer at Community College B, works with faculty to create quality online courses. Brenda's challenges are many. Community College B has four campuses, and she is responsible for training mentors who then mentor faculty on all campuses. She also does one-on-one training with faculty at the central distance learning office. The competing messages she receives includes some of those we have already seen, such as those experienced by Angela. She must work with faculty without treading on academic freedom, which was a topic that came up with notable frequency. Though faculty create their own courses on all of the campuses I visited, the instructional designers and instructional technology directors are responsible for making sure the sites are either ADA compliant, or they disseminate the appropriate information to the instructors, so they can make the sites compliant themselves. When I asked Brenda about this, she replied "faculty are just not aware. They haven't had to be aware." She went on to say they have not addressed accessibility issues very much, and she presumes because it just has not come up that they are aware of. At the same time, it is something she knows she must bring up, so she tries to find other ways to bring it up, "so the faculty won't be defensive." They become defensive when she brings up issues of accessibility because they feel it takes more time and effort on their part to make a course accessible for students. Their sentiment is "it's my academic curriculum, and my ability to determine

how content is delivered in my course because I'm the content expert." They feel as if "someone's attacking the way I'm doing [my online course" if questions are brought up about course accessibility or structure. These are examples of some of the attitudes faced by college personnel.

Role Behavior

Role behavior refers to the repeated performances of an individual. This comes to be the expected behavior patterns of a person. Another way to look at this is it might be behavior for which someone is known or recognized. Two respondents especially fit this category: Andrea and Denise. According to the National Council on Disability (2001), "leadership within agencies, more than any other single factor, primarily accounts for their embrace of E&IT [electronic and information technology] accessibility and for success in achieving it." Specifically, that leadership takes any number of different forms, but in every instance "involved the translation of life experience or personal commitments into sustained efforts in the workplace: efforts aimed at capacity-building, establishing the credibility of accessibility efforts, demonstrating the viability of proposed solutions, and creating institutional supports for accessibility efforts." These sentiments accurately describe both women.

Andrea's energy was mentioned by all of her co-workers, and they all mentioned working on "her ADA committee." She was described by Amy, Director of Tele-Learning, as follows:

[Andrea is] a wonderful person . . . always worried about being sued and things . . . you know she is just wonderful and she just really gets into it. We know [Andrea's] doing that for us. Sometimes that's how you have to get things . . . you know moving in that direction.

Andrea's contributions to the furtherance of accessibility initiatives on campus are legendary. All of the respondents mentioned her by name several times, and of all the respondents I talked with during the course of research, she understood the concept of this study best even though web accessibility is not her primary field.

What Amy means by "she just really gets into it" is Andrea passionately pursues accessibility for her students while at the same time encouraging their independence. She knows she cannot accomplish this goal alone, so she recruits faculty and staff, some of whom she calls "real natural advocate[s]," and she pursues the ear of sympathetic administrators who also serve on the ADA committee, for which she is grateful. She also created an accessibility plan, through the committee, which gained approval of the president. The plan calls for complete web accessibility in two years, including faculty and department pages. Andrea says of herself, "prophets are not known in their own city. They have to have credibility from without to come in and validate what they are hearing from the home people." To accomplish this goal, she brings in outside speakers and sends campus personnel, mostly faculty, to conferences with notable web accessibility trainers with the hopes that they will come back with some modicum of her enthusiasm and spread the word. At the same time, Andrea used the term "disability faction" to describe the group to which she belongs which indicates that for as much progress as she may have gained, there is much more to be done.

Denise is another respondent whose role behavior stands out in the effort to promote web accessibility for students with disabilities. Next to Andrea, Denise understood the purpose of the study best, and her own efforts on campus to help make speak for themselves. When she came to campus, the Services to Students with Disabilities had nothing, but now they are equipped to serve their students, and 10 students were taking online classes during the semester I visited with her. To help facilitate online access for her students, Denise regularly attends meetings with instructional technology personnel, such as Debbie and Donna, in order to make sure they have the latest and most up-to-date information in accessibility initiatives. She allows students who do not have their own computers to use her work computer to take tests if no other computer is available, and she is not using it. Denise also regularly counsels with other areas on campus who are trying to update their web sites for better access for students with disabilities who use assistive technology. Her relationships on campus prove a bit more challenging than what Andrea experiences, however. Denise says of herself, "I'm kind of country and a little blunt sometimes, but . . . sometimes that can be endearing and sometimes not." Her persistence has paid off thus far.

Multiple Role Conflict

Multiple role conflict occurs where one individual holds several roles on campus (Bertrand, 1972) or wears several different "hats" in his or her own office. Pressure is applied when there are competing demands placed on that person's resources. For example, there may be competing demands placed on time, financial resources, or

106

personnel (Gaynor, 1998). Multiple role conflict was a very common theme among respondents. Because of this, the following discussion is organized around each institution.

Community College A. Andrea and Angela both feel the pressure from multiple role conflict in its full force. Andrea has a "one man shop" where she has "mixed duties," which includes everything from training students to educating others to enrolling students to serving on committees. Additionally, she feels that her area is seriously under-funded. It is currently funded by mostly soft money, which is not uncommon, but this kind of soft money also funds other areas of the campus, and the ratio is apparently seriously disproportionate, "unequally distributed." She also feels that she is understaffed, which is a common lament among respondents. With almost 348 students with disabilities to serve, she does not feel she is adequately prepared.

Angela echoes Andrea's sentiments but for different reasons. She, too, wears "two hats," but there is too much work to be done. With a growing online program and plans for expansion, Angela has her hands full. Her "self-contained" area needs more personnel to serve the faculty who need assistance. She also admits that for as many faculty as they help start their courses, they do not check them again for updates or for ADA compliance. Because she does not allow Anne to help faculty with ADA compliance, this is her added responsibility. Her chief compliant is the lack of time. Faculty's chief compliant is also the lack of time, but they complain for two different reasons. Andrea laments the lack of time because she would like more time to train new online faculty, check existing sites, develop new projects, and train faculty on ADA issues without

107

overloading them. Faculty members say they do not have time to put into making their courses ADA compliant. In essence, Andrea says that creating online courses is time-consuming enough for faculty, and they are concerned about the work and time involved either having to go back and retrofit a site or having to learn something new. This perspective makes Angela's job even more challenging.

Community College B. For the sake of convenience, discussion of personnel at this institution is divided by area of influence or specialty. Brenda and Bob both work in the distance learning area. Brenda, an instructional designer, is also a faculty member. Bob is in charge of distance learning, which includes all forms of web courses, ITV, and tele-courses. He also teaches classes on campus. Brenda expressed frustration with all of the elements that contribute to multiple role conflict except financial constraints. Unlike the other areas on campus, "funding is not an issue" for the distance learning area. Like Angela at Community College A, Brenda worries about faculty's perceptions about the time and work involved needed to created accessible web courses, which in turn affects her time. Bob, on the other hand, does not mention any of the elements that create multiple role stress though I would expect him to given his position. In contrast, he says in response to my questions about online accessibility, "We've never asked should we do it. We've always asked how and tried to do the best thing." According to Brenda, however, Community College B has not addressed accessibility for students with disabilities in online courses much at all. The current focus of their distance learning committee, on which both serve, is plagiarism, and she feels that accessibility might be a good next issue for the committee's focus.

Brett and Betty are both chief academic officers on different campuses at Community College B. As chief academic officers they have many roles. Brett thinks of himself as a "barrier buster," which means he tries to work as much as he can to eliminate the barriers that stand in the way of his faculty and staff doing their best work. Brett and Betty both note that finances are strained. This is a particularly difficult time for Brett because his campus is steeped in technology. One lab has 100+ computers, and the campus has an additional 20+ smaller labs for students' use.

Between the two chief academic officers, Brett understands the scope of the study well. He was the first "faculty member to offer an internet based course at this college" and since that time, he has remained very active in all things distance learning. The stresses he faces on his campus include lack of time to accomplish all there is to accomplish, the lack of appropriate resources, and the lack of personnel. He believes that no one at Community College B would say "we are non-ADA compliant because I think we are to a great degree, but we are not as user friendly for disabled students as we could be." He later remarked that with the lack of resources, lack of time, and lack of personnel, it is difficult to do more than what is minimally required by law.

Barbara, Benjamin, and Becky all work with students with disabilities. Barbara, the Director for Center for Students with Disabilities, supervises Benjamin, a computer expert for the center. Becky is the coordinator for the center for deaf and hard of hearing students. The two areas are separate on campus, which is a common practice as deaf and hard of hearing students do not see themselves as disabled both from a cultural and practical standpoint. Barbara and Becky both have many roles in their dealings with students that are similar to those described for Andrea who has a similar position at

Community College A. Barbara and Becky share concerns over finances, personnel, and time as well with a few variations. Barbara described her situation thus: "we don't have a budget . . . but we have to supply adaptive technology . . . at every [Community College B] location." In one respect, she feels lucky in that she makes requests to her superiors, and they find the money she needs for equipment, but six months later, the equipment, which is very expensive, is outdated. Personnel and time do not come as easily to her. Becky shares the same concerns. Fortunately for Barbara, Benjamin writes grants in his spare time to get additional equipment that the center needs, but the equipment goes mostly for the students who are not deaf or hard of hearing.

Regional University C. Charles and Cindy both work in distance learning at Regional University C. Charles is the director of distance learning, and Cindy is the director of off-campus education. Charles has a "dual position here." He coordinates ITV courses, and he teaches communications classes. Part of the responsibility of coordinating ITV courses is generating agreements with receiving sites, conducting orientation classes, training other instructors, training students to use the equipment, and scheduling facilities. Cindy also carries multiple roles "by default" because of her vast experience with instructional design. She manages advisors on satellite campuses, supervises ITV personnel, and facilitates web course schedules and instructors even though that is not part of her official responsibility yet. Charles and Cindy both lament the lack of funding for their areas and the problems that it causes. Their school relies heavily on grants for funding, and their area is no different. They do have some money for some things, but it is all soft money. "The school lacks resources to support growth" long term. Charles'

concern regarding finances turns to students and their inability to purchase upgraded equipment that equals that of the university. This causes incompatibility problems for students, many of whom are poor, which contributes to frustration. This problem is no doubt compounded for students with disabilities who use assistive technology.

Catherine, Chip, and Carrie all work with students with disabilities. Catherine is the director for student services for deaf and hard of hearing, Chip is the director for student support services, and Carrie is the assistant director for student support services and the technology specialist for student support services. Chip and Carrie work in the same office while Catherine is housed in a separate office. Catherine is also a faculty member who teaches human resources classes. Catherine experiences multiple role conflict on all levels. She has multiple roles in that she holds two main positions on campus. In the course of those duties, she discussed the lack of time to accomplish the tasks that needed to be done to serve her students, their interpreters, and do her work as a faculty member. One thing that would help her is more personnel. She also says that the lack of appropriate funding is an issue. Her area is a subset area of Chip's area, but her salary is paid out of another pool of money. In fact, her area does not have a budget of its own. Like Barbara from Community College B Catherine relies on requests for resources to get what she wants and hope that those requests are granted in a timely manner for students and staff. Chip and Carrie express similar sentiments about finances though their area is primarily funded out of Department of Education funds. Chip said, "The lack of money is the biggest problem, and it "will always be an issue" as far as he is concerned.

Lastly, additional personnel would be useful for Chip and Carrie since they are frequently looked to as experts in accessibility for students with disabilities. Chip has

been director for 23 years, and even though they are not required to by law, he and Carrie

frequently honor accessibility requests for their ITV receiving sites for students with

disabilities because they have the knowledge to do so where others may not. Because

they are called on to help so frequently, a few extra hands, he says, would be useful to

relieve the workload.

Regional University D. Debbie is the assistant director for academic technologies

and training. Denise is the disabilities support services coordinator for Regional

University D.

Denise experiences all of the elements of multiple role conflict described by

Gaynor (1998). She tries to "create equal access" for students, teach independence, train

students to use assistive technology, train others about appropriate accommodations for

students, do whatever is needed to help students, and be resource conscious at the same

time. The issues that cause conflict for her are significant because of the infancy of her

program. Resources are scarce, and as she says, she was "met with extreme resistance" in

the beginning. "Creating equal access is not cheap," which poses problems for any

university, especially one that is already behind the curve. She could use additional

personnel to help with compliance efforts and assistance with students. She is also

painfully aware of the amount of time involved in bringing her workplace, including

online elements, into compliance. In her estimation, Regional University is nowhere near

"508 [compliant – that] would be a complete change in purchasing and the thought to

actually get any assistive technology . . . they would have to totally revamp the thought

process." She does believe, however, that some progress is being made.

112

Debbie experiences much of the same conflicts that Denise does. Her area is financially strapped, and they are trying desperately to create an area where they can train faculty to create better online courses. To indicate how dire the conditions are, she claims that they had "spent all we had for this year by March," which meant that the rest of the year would be pretty lean. She, too, has personnel problems, but her personnel problems are different than Denise's. Debbie not only needs more people to help with her endeavor, but she needs a certain type of people. She needs faculty or people who have taught in the classroom, because faculty members want other teachers as trainers. Time is also pressing factor for Debbie as faculty are conscious of the amount of time it takes to create online courses, which is why so much effort is going into creating a center "that they have faith in rather than just the IT department."

Subsystems

A subsystem is a single unit or entity, such as a college or university. An important element of these subsystems includes the relationships that occur in and among these groups. Loosely coupled systems theory will be used to examine specific subsystems as defined by the respondents and their respective schools. In particular, Weick (1976) notes that parts of an organization are loosely coupled based on what they have in common with each other. They may also be loosely coupled based on frequency of contact. Weick notes loosely coupled systems in educational institutions in 15 different ways, five of which have direct bearing on this study and have already been noted elsewhere.

Community College A. Successful subsystems work together to accomplish goals, and Andrea seems to do that by building relationships and creating networks of people in order to "increase her sphere of influence" and "build credibility." She accomplishes this task by reaching out to sympathetic faculty members, taking them to conferences, and co-opting them with the hopes that they will motivate other people. She recognizes, however, that "progress is slow" with this kind of collaboration. Andrea is encouraged, however, but the creation of a committee to study ADA issues on campus and hopes that this committee will be the vehicle through which greater accessibility for students with disabilities can be achieved. One benefit of the committee comes through its membership, which includes an upper-level administrator, who is an advocate. Andrea is hopeful that the administrator's influence with senior administrators will be useful in the future.

Anne and Andrea work together with some degree of frequency even though their offices are some distance apart. Anne helped Andrea create a web site that has examples of different types of disabilities. For example, it has a sample of what a computer screen looks like to a person with low vision and a sample of what audio sounds like to someone who is hard of hearing. Andrea uses the site to train others in her area and for the purposes of general public education. Anne and Andrea also serve on the ADA committee together where they are both quite active. They make a good example of Weick's (1976) first applicable principle of a good but slowly influential network. Though her primary responsibility is ADA compliance for the campus web site, Anne hardly speaks to Angela, the person responsible for training faculty to develop online courses because that is the way Angela prefers the relationship.

The situation proves frustrating to Anne. She "wish[es] we could [help] faculty, but [Angela] told us that she wanted to take care of the faculty and nobody else . . . I can't do anything about it. It's not my area, and I'm told I'm not supposed to interfere." Even though she is now responsible for keeping the college's web pages ADA compliant, she "hardly ever interact[s] with Angela's office, which is sad. [She] think[s] as a college we should all work together instead of being proprietary in areas. [Angela] basically doesn't want to hear what I have to say." What Anne is worries about is the lack of quality control for what Angela actually does to oversee faculty pages. Anne confided that Angela is "not as thorough as [Anne is] and [is] not [as] up to date. Faculty pages still have things that can [literally] cause seizures." She remains concerned that it is not enough to keep Community College A safe from a lawsuit. In short, because it is her responsibility to maintain ADA compliance, she would prefer to have more centralized control over accessibility issues, but according to her, Angela will not allow her access and faculty and a few departments will not relinquish control of their pages.

Angela says of her instructional technology group that they are "quite contained over here," and it seems to be something of which she is proud. Her area is solely devoted to helping faculty develop their online courses, and there is little to no oversight in quality control. This goes back to Weick's (1976) notion of "infrequent inspection of activities within the system." In fact, faculty members seem to have the upper hand with regards to how much she is willing to interfere in their course development and structure. She tries to "steer faculty away from poor design" without actually telling them what to do with regards to accessibility. She has never said "here are guidelines; you must make your course match." Angela is "very, very careful not to tell faculty how to teach and

design," which indicates that they wield a great deal of power on campus. She claims to meet with all new online instructors and see "85% of the courses built," but when I asked if she ever sees the courses again to check for quality, she said that she only "look[ed] at online courses on an as needed basis." The activities described in this paragraph that occur in Angela's area constitute good examples of efforts to block coupling. Entities might be effective by themselves, but the loosely coupled systems theory posits that groups can be more effective when combined in some manner with other groups. The blocking of coupling seems to render both the blocking group and the potential receiving groups less effective in this case.

Community College B. Brenda and Bob both work with online course delivery at Community College B. Brenda's network is fairly far-reaching since she coordinates the mentors on each campus. She offers a great deal of training through her area, but it is unclear how much of the training faculty actually use. She claims if she offers a class under one heading, faculty will not attend, but if "she offers the class under a different heading [one that implies teaching technology rather than online instructional technique], they will come." From our conversation, faculty members appear defensive and territorial about their online classes, so Brenda feels she must be extra cautious about discussing accessibility issues with them. In fact, she admits that they "haven't addressed accessibility much at all" and feels "accessibility [online] is something we need to work on directly next year."

Bob admits that faculty sites are not evaluated, which he acknowledges is a weakness. Faculty develop their own courses, and there is very little oversight in that

area. Bob and his staff do keep up with online instructors if they have problems or issues during the semester. He notes that online courses at the college use everything from Blackboard to stand alone web sites to straight text to streaming video, and they periodically provide updates at the beginning of each semester on new developments with Blackboard. However, they do not "provide ADA information in workshops." His remark was they "don't make it a big issue." Brenda later explained that ADA information is not a matter pressed with faculty because faculty may become resentful if they think they have to spent more time and effort on a course they have already created.

When I asked who would be responsible for getting information to faculty about making their web courses accessible for students with disabilities who use assistive technology, Bob indicated that it would be Barbara's area who would talk with faculty. Brenda said she would talk with the faculty. When I asked Barbara who would be responsible for this task, she said it was Bob. In this instance, there are few guidelines, and there is little to no oversight.

Barbara and Becky both work with students with disabilities at Community College B, and they move very loosely within the same subsystem. These women are problems solvers, and as such, they tend to create and maintain relationships to get what they need for their constituents. Their primary goal is always accessibility for students with disabilities, and the challenges are many: lack of resources, time, and personnel. To address those challenges, they network with others like them to learn more efficient ways of operating, and they share ideas. Barbara would like to be able to do this more freely on campus, but she feels she is hindered by the overarching hierarchy on campus. She sees the hierarchy as "a stumbling block" that slows her progress.

They also take advantage of resources within their college system, administrators, for example, who will secure resources necessary for their success. Becky feels they would be more effective if "we could combine efforts to identify needs; we might be able to contact the right people if we have more of a connection." Though she is relatively new on campus, she looks forward to strengthening her relationship with Barbara. They both work hard to reach out to the public during the many speaking engagements during the year. Barbara remarks that "many [students and parents] don't know that colleges and universities are required to provide accommodations [like the high schools do] – they don't know that," so she and Becky tour the city making presentations at public schools to spread the word.

Regional University C. It took several interviews and pointed, but unanswered, questions to finally get to Cindy, who solved a mystery about Regional University C. There is no one "in charge" of their growing online course offerings, no one responsible for the courses, instructors, and, it seems, the accessibility of those courses for the very large population of students with disabilities on campus. Noting the look of surprise that must have flashed across my face, Cindy volunteered, "Charlotte is the closest thing to that. Charlotte is the Director of the Title III grant . . . the purpose of the Title III grant is to start developing web-based and web supposed courses, blended and fully online." Though Cindy herself has extensive experience in instructional design and web course development, including web accessibility principles from prior job experience, "because [she is] not doing web course development that is not something [she] has tried to find out about [in her current position]." Cindy's attitude seems predominant. In the

118

university's defense, they have not been offering online courses for more than two years, and it takes time to develop policies and procedures for distance learning. One reason the university may not have had complaints yet is because, according to Charlotte and Chad, almost all of the online courses have been graduate level courses. Only recently did they begin offering sophomore level courses, and they will begin offering freshman level courses next fall. Cindy anticipates that because of her expertise, responsibility for online learning will come under her purview sooner or later, however.

Several elements of Weick's (1976) dominate this campus. While various members of the online/ITV/distance education area try to move in the same direction, their progress gets stymied by lack of funding, lack of widespread faculty participation, lack of knowledge, and lack of coordinated efforts, meaning one group on campus does not know what the other group is doing. Also, according to Cindy, they do not have a long-range plan in place for their online offerings, which puts the university in a difficult position. Another challenge includes little oversight because faculty are responsible for their own course development. Finally, Regional University C is the best example in this study of a decentralized system. There is no one individual charged with the responsibility of making sure the online course offerings are, among other things, accessible to students with disabilities.

Other issues on campus include the lack of appropriate knowledge to accomplish such a task. Charlotte admits "as far as having the background or direction that I feel like any of us need, I would say that as a whole, we probably fall short on having the necessary background." She also notes that recently they did try to have a speaker come to campus to talk about Bobby, which is a web accessibility validator that assesses the

accessibility of web sites. Bobby offers feedback on the problem areas and prioritizes what must be corrected first. Unfortunately, the planned conference fell through. Even still, she feels the "jury might give us a failing grade as far as consistency and meeting the criteria."

Carrie, who handles the technology aspect of the student disabilities office, "wishes faculty would assume more responsibility on the instructional side for accessibility." She thinks part of the slack is there due to the lack of good information. This sentiment is echoed by Cindy, who says ignorance is to blame for some inaccessibility - "people don't know."

Regional University D. Something similar to the situation at Regional University C exists at Regional University D. Debbie and Donna work with faculty to build online courses, but little is done to facilitate accessibility for students with disabilities. Debbie laments that "faculty don't care. They say they are going to do tables and frames anyway. We've been trying to show them other methods of getting the same result they want without restricting who could access the information." She says her efforts have been marginally successful. Donna, on the other hand, claims that "the first time that [web accessibility issues] even crossed [her] mind was when I got the email" from me requesting an interview. Denise is not aware of material available on campus that covers web accessibility. "Once again we go back to the fact that IT is not willing to go there. I somehow think that they somehow think that people with disabilities are just going to go away." These sentiments speak to notable absence of cooperation between two key offices on campus that could make access for these students happen. When I asked about

the relationship that exists between the two offices, Debbie remarked that it "isn't where it should be." She went on to say that she would like to work with Denise, but they have not had an opportunity to collaborate on anything. Denise characterizes the relationship between the two offices as "a challenge." She later says that their "relationship has been tedious sometimes," but she hopes it improves. The relationship between Denise and Debbie is a good example of Weick's (1976) loosely coupled system principle where collaboration is minimal or sluggish, or it is hindered as it progresses through the channels of the institution.

Section Summary: Subsystems in Institutions

Five main concepts were discussed in this section: roles, role conflict, role behavior, multiple role conflict, and subsystems. Roles are positions in an organization, and role conflict occurs when one or more people make demands on someone at the same time (Katz & Kahn, 1966). Role behavior refers to repeated behavior in an individual. Multiple role conflict occurs when someone holds more than one position or plays several roles in an organization (Bertrand, 1972). Finally, subsystems refer to a single unit or organization, such as an educational institution. All of these elements were present at each of the four institutions in this study.

Role conflict was most prominent in Andrea, Angela, Anne, Brenda, Debbie, and Denise. I did not find role conflict at Regional University C. Andrea and Brenda both mentioned wearing "two hats," which means they carry the load of more than what the job title on their business card describes. Andrea not only has her student constituents

121

pressing her for assistance, but she has committee work, and administrators looking to her for answers to the on-going problems of accessibility across campus. Angela is both the coordinator of instructional technology and director of online learning. While those two things seem to go hand in hand, she has to deal with faculty, staff, and students. Brenda's situation is very similar to Angela's except she does not have the administrative responsibility. Instead, she takes on more faculty training responsibility, which can be more stressful. Anne's position is a bit more precarious in that she works for the administration making the college web page ADA compliant, and she works with Andrea to help the center that serves students with disabilities, but she cannot touch faculty members' web pages. Debbie and Denise experience role conflict as well. Interestingly enough, Denise sees Debbie's area as one source of the conflict she endures and vice versa. Denise tries to get what she can for her students, but Debbie feels Denise is trying to take over her territory.

Role behavior was most prominent in Andrea and Denise. Both women have strong personalities and drive. Interestingly, they are both ADA coordinators and not instructional technology personnel, and they both do a great deal for web accessibility on their respective campuses. Andrea leads the ADA committee, which was responsible for setting up current policies and procedures and the only existing rollout plan among those institutions studied. In the short amount of time she has been at Regional University D, Denise has managed to put together the beginnings of an ADA program that will serve the university well. She also works with other departments on campus to improve their web sites and audio/visual holdings for students' access.

Multiple role conflict was another common theme among respondents. They occurred more frequently in the two-year colleges than the regional universities. One possible explanation is that tighter budgets force administrations to double-up on duties, so personnel get loaded down with additional responsibilities they would not ordinarily have if they worked at a larger university. Andrea and Angela are good examples of employees who do double duty. Brenda is another one. She trains faculty mentors, develops online courses, develops training programs, trains faculty, learns about new technology, and in her spare time, she teaches classes as an adjunct faculty member. Catherine's situation is similar though she works at Regional University C. This university's budget situation is serious, and the population of students she serves is not very large, so she must teach as well as serve the deaf and hard of hearing population. The combination of roles only complicates an already challenging situation.

Relationships in the subsystems proved interesting to study. They ranged from strained to very good with most at lukewarm to moderate when warming up served a purpose. The strained relationship between Denise and Debbie stems from the perception that Denise has been trying to take over instructional technology's responsibility for providing accessible technology to students with disabilities. In the early days, there was considerable misunderstanding about whose responsibility it was to make arrangements for equipment and when accommodations were appropriate. Denise was supported, and Debbie apparently feels slighted. On the other end of the spectrum are Andrea and Anne, who work very well together to get Community College A's web site ADA compliant. They serve on the ADA committee, and they collaborate on projects for the benefit of Andrea's students and for the training of faculty and staff on campus. In the middle we

123

have the lukewarm group, which is most of the rest of the respondents. The have

relationships with others when they need them, but otherwise, they keep to themselves.

Policy Implementation in Institutions

Many obstacles stand in the way of implementation, including the agency itself.

Other hindrances to implementation include the lack of resources, failing funds, and

"accumulation of official and unofficial constraints on behavior" (Van Meter & Van

Horn, 1975, p. 453). Each of these barriers manifested themselves to varying degrees in

the institutions examined in this study.

Agency Barriers

The administration at Community College A acts as a barrier to implementation

of its own ADA plan when it prevents Anne from working with faculty and departmental

web pages. Even though it is her job as web administrator, Angela is the only person who

is allowed to work with faculty pages. Amy describes the climate on campus when

discussions regarding ADA and the Internet first started on campus, and faculty learned

they would have to make their web pages compliant. "It was institution vs. faculty - bad

in the beginning," she said. Even though the president's plan is to move the campus

toward compliance, Anne is still not allowed to work with faculty on their pages.

Furthermore, as I have already noted, there is very little oversight with faculty after the

initial meeting with Angela, and little to no and follow up with faculty on their web sites.

Preventing Anne from doing her job in its entirety seems counterproductive to the

college's goal of becoming fully web accessible.

Community College A faculty are also allowed autonomy in the realm of web

accessibility. Angela and Amy both claim that because of their academic freedom, they

should be allowed more leeway on their web pages even though the law clearly says that

the Americans with Disabilities Act applies to the Internet. Faculty reaction to the notion

of more time and work control Angela's response to the call for web accessibility. Anne

comments on the "struggle - people don't like change. They feel [something is] being

taken away from them." To get by, Angela's approach is to "train them and work with

them to just keep good design strategies in mind, rather than saying here are the

accessibility guidelines . . . you *must* make your class match that." She feels this is a

"much more realistic" approach.

Several respondents at Community College B mentioned the presence of a fairly

strong hierarchical structure on campus. In some respects, it seems necessary to have

some degree of bureaucracy to run a community college with multiple campuses. On the

other hand, respondents feel the hierarchy prevents voices from being heard and potential

problems from being voiced. Barbara, in particular, feels the hierarchy is a "stumbling

block." She does not feel she is in a position at the college where she can make decisions.

She feels if she "was at a higher level and had access to certain administrators, I think we

would not having the difficulties that we have now. My difficulty is where I am in the

hierarchy." One of the things she would do is get better access for Benjamin to student

data, student online courses, and faculty online courses in order to facilitate better web

accessibility. Becky wants more access to pre-production video production for closed-captioning. Post-production is too late for effective accommodations.

Attitude is another access barrier. Barbara admits that she discourages her students with disabilities from enrolling in online classes because, she claims, students feel more comfortable with a teacher in front of them. She says they prefer a campus class because of the comfort level. Students with disabilities "need a physical body to talk back to. The online environment is a discomfort zone for them. They need that support." Becky also believes students prefer classrooms to the online environment. Instead of online enrollment, Barbara and Becky put most of their students with disabilities in classes with full-time instructors, so they can get the attention they need. This behavior seems to run counter to their desire to make them independent.

Bob, dean of distance learning, mentioned the hierarchy structure on campus, but he did not seem to feel that it was restrictive. However, as a dean Bob occupies a different place in the hierarchy than Barbara, Becky, and Benjamin. One example of Bob's idea of the hierarchy at Community College B is the request for proposal (RFP) process that governs how online courses are created. Prospective online instructors make proposals to the distance learning committee for possible online classes. The committee then determines what, if any, training needs instructors have. The distance learning area "does not provide ADA information in workshops. [They] don't make it a big issue." Bob and his staff assume students in online courses already know the tools or have the tools they need to be successful in online courses. "If they are browsing the Internet anyway, they probably have the software and hardware they need." He admits they have not addressed ADA issues or questions except on an individual basis. OCR clearly rules

against case by case basis thinking (High Tech Center Training Unit, 1999; Paciello, 2000; U. S. Department of Education, 1998; Waddell, 1998).

Another way the distance learning area hinders web accessibility is the lack of oversight over faculty developed courses. Bob admits that faculty sites, which include everything from text to streaming video, are not evaluated. He says the "issues are always there, we amend and move on." The prevailing attitude of online leaders is to do nothing unless a problem arises. If a problem presents itself, they will handle it. Barbara, Becky, and Benjamin would be glad to help with web accessibility in online courses, but Bob says personnel in the distance learning area "really don't have any direct connection" with them.

Finally, faculty members themselves are unexpected but apparently very strong barriers to accessibility. This was a recurring theme on all campuses. Brenda avoids the topic of accessibility with faculty she trains for several reasons. Making courses accessible is time consuming, and faculty are concerned about the amount of time it will take to make their sites compliant. She also does not want faculty to be defensive. "I don't know how defensive they're going to be when we start talking about those issues." She is not even sure how much they know about the subject because distance learning personnel "do not talk to instructors about accessibility." Their committee work last semester was the first time for them to think about it. Instead, she admits they "have probably been using [Blackboard] as a crutch, that we are using an ADA compliant course management system, and not really thinking that much about out individual files that we are putting in [it]."

Brenda acknowledges "what [she and faculty need] most is awareness." She believes she needs to be more aware of what the problems are with web accessibility. She says "faculty are just not aware because they haven't had to be aware." For example, she has never heard a text reader articulate text from a screen. Additionally, she is not even "familiar with how much the center for students with disabilities assists with technology related things."

The institution can also hinder access by fostering online program growth. Community College B's distance learning program is a good example of this. Brett was an early adopter of distance learning when he was a faculty member. His course was a simple web site, long before popular course management sites, such a Blackboard and WebCT existed. It was a grassroots effort at the time with virtually no training provided by the institution, but the college has moved to a system of assessing new instructors' training needs and folding them into training sequences as needed. The problem is that, according to Brett, there has not been a lot of discussion about web accessibility to go along with the growth in distance education. He says, "ADA is very important, but [the institution has] not really technologically made as many efforts as we should to meet the needs of the population." In his estimation, part of the problem in the lapse of adequate information sharing has been rapid growth and inadequate planning for concerns such as accessibility. He is "not sure we have done a very good job of taking into account on all of those people in the population and trying to make sure every course is going to be as friendly as it needs to be for them." At the moment, concern is focused on making sure the online college catalog is ADA compliant. The issue of web accessibility came up in

the distance learning committee as an issue, but unfortunately, according to Brett, not as a primary concern.

Perhaps the biggest deterrent to implementation of an accessibility plan at Regional University C is complete decentralization of instructional technology and distance learning efforts. Because Regional University C's has only begun offering online courses within the last two years, no one has been assigned the full or even part time responsibility of managing their success. For the time being, the focus of current personnel and instructors is simply getting courses created and put online. "Administration of web-courses has not been clearly defined on our campus. [It is] not something that we have been doing for very long." Charlotte admits that it takes time to develop processes and procedures. At the same time, the current feeling, however, is that the "campus population should adjust that." Without a leader in this area, important business such as web accessibility get overlooked or pushed to the side. This is particularly critical at Regional University C where the population of students with disabilities is high.

Another institutional barrier is the mindset of faculty. Cindy thinks too often some people's first thought is, "You mean I have to make an accommodation?" Instead, it should be "Oh, I need to think about another way for people to be able to access this piece of information." Her thinking is if she and others like her can just get people to think differently about the act of accommodation, the push for accessibility might not be so cumbersome. She also thinks part of the problem is ignorance. "People don't know. Very rarely do people . . . ever sit at their computer and say how can I design a course so

anyone with a disability can use it? People don't think that way. Ignorance and attitude."
Catherine, Charlotte, and Chad mention faculty attitudes as well.

Chip and Carrie mention people's attitudes as barriers to implementation, but in a slightly different way. They have a problem with personnel across campus who purchase equipment and software without thinking about how that purchase will affect the disabled population. The same is true for departments that adopt CDs or other software with textbooks. According to Chip and Carrie, mathematics software is especially problematic when students attempt to access it using adaptive technology. The same is true for some CDs that often accompany new textbooks. Chip and Carrie described the CDs' contents to include audio clips and streaming video clips without captioning, for example. Both of these educational tools are inaccessible to students with disabilities who use assistive technology.

A different way attitude presents a barrier to implementation is in the attitudes of those who serve students with disabilities. Chip and Carrie, like some of their counterparts interviewed in this study, think students with disabilities would be better off in a campus class as opposed to an online class, so they are able to get help if they need it. Both agree "students want one on one – [to] be able to ask for help." Catherine thinks the same is true for culturally deaf students. She says "they want one on one visual [contact with the instructor] to make sure that non-verbal non-manual expression is happening." Catherine went on to say that deaf and hard of hearing students have not expressed a real interest in taking online classes, presumably for that reason. At the same time, her own students, who are deaf and hard of hearing use the Internet all of the time, "at least once a day." They do a lot of research online for her classes, and most of them

130

use the library and use the Internet for research. It is only a matter of time before they encounter streaming video or audio, if they have not already. Since they are in school, interpreters are available to them. Once the students are out of school, either the streaming audio or video material they access on the Internet would have to be closed-captioned, or the information would simply be unavailable to them.

Finally, Charlotte sums up the institutional perspective best when she said the following:

You don't prepare for it until [web accessibility] becomes eminent, like a hurricane, and at the point where it becomes an issue, we'd put it in high gear and figure out what we had to do. We would see that we got it done and that our faculty was prepared to do it. Right now, [accessibility planning] is an issue because unless we make the conscious effort to put it there, it's not going to be there.

At one point, Charlotte and Chad had looked into bringing outside speakers on campus to help educate faculty and others on campus about web accessibility. One professor discovered Bobby standards and guidelines. Bobby is a web accessibility validator that determines and prioritizes errors that renders a web page inaccessible to people with disabilities who use assistive technology to access the site. Charlotte laments that "the jury might give us a failing grade as far as consistency and meeting the criteria."

Several factors at Regional University D act as access barriers. The most prominent is the lack of cooperation between student disabilities coordinator and instructional technology offices. The history of ill will between these two agencies slows progress. When Denise first came to the college, efforts to secure assistive technology,

lab space, and web accessibility were met with "extreme resistance" from the IT area. Denise mentioned several times that they "thought she was trying to take over their area." Once they realized that she was not trying to take over IT, tensions cooled, but the relationship did not substantially improve. When I asked about their current relationship, Denise said "our relationship has been tedious . . . unfortunately sometimes they have not seen us as someone to help . . . we still tread lightly."

Another barrier to web accessibility is the institution's lack of early investment into assistive technology. According to Denise, all of the assistive technology the school currently owns was purchased in the last two years. As for online accessibility, that would "be a complete change in the purchasing and the thought . . . process." Online accessibility will come slowly.

Faculty prove to be a challenge at Regional University D. Because faculty will only allow IT so much access to them, Debbie must break through to them in other ways. The resource center for faculty development is one way, but because faculty on campus have so much autonomy, there is no way for Debbie to monitor their online courses for quality control when it comes to things such as accessibility. She admits there is "no review process," and faculty on this campus have so much autonomy that even if she did offer instruction on web accessibility, "faculty do it their way anyway." This may be one reason she has never gotten into a conversation specifically on disability with faculty. She went on to say, "Faculty say they don't care; they are going to do tables and frames anyway - we've been trying to show them other methods of getting the same results they want without restricting who could access the information."

Denise did say there is some oversight, but "it is very limited to the department level." The departments are very protective of their faculty, and they don't want any kind of public knowledge of any mistakes or anything like that." When I asked how she planned to work around this issue to facilitate web accessibility, she did not have an answer. Debbie sums it up best: "I think they think that people with disabilities are just going to go away. Some times I am pretty sure that . . . is the thought process. Somehow, that [they] won't be affected if [they] just keep ignoring it."

Lack of Resources

Finances at Community College A are tight. Angela's distance learning and instructional technology areas are completely grant funded. Andrea's area for students with disabilities was originally grant funded, but it is now funded by college money. While funds are tight for Andrea, she does have a little extra money for educational conferences. Additionally, the ADA committee pays for extra resources her center might need.

Resources at Community College B for most areas on campus are not much better. Barbara has no budget of her own, but she is still responsible for supplying assistive technology to all campuses. Fortunately, she has a grant writer in Benjamin. Equipment is expensive, and it becomes outdated quickly. Additionally, both Barbara and Becky comment that students with disabilities who need assistive technology do not appear to have necessary resources they need off campus. In fact, Becky speculates about how many of them do not have computers at home. Becky is also concerned about the

expense of captioning. Barbara and Becky both serve students with disabilities, yet their areas are housed on two different campuses. They also appear to be funded out of different pools of money. The separation of resources and labor appears to reduce what could be a highly effective core group of people. Brett and Betty lament tight budgets as well. The only area on campus that appears to be fully funded is the distance learning area.

Money is tight everywhere at Regional University C. Catherine's department has no operating budget. She is technically part of the Center for Students with Disabilities, so operating expenses are paid out of their budget while salaries are paid out of another money resource. Carrie and Chip agree with Catherine that resources, including finances and personnel, are scarce. Charles and Cindy both comment that resources are tight in the distance learning area because the majority of their funding is grant money. While they agree resources are hard to come by, they also comment that resources seem scarce for their students as well while Carrie, the technology specialist for the students with disabilities assumed students who take online courses would have their own equipment. Chad and Charlotte, who work with the Title III grant, agree. The overwhelming majority of funding at this campus for growth projects is grant money, which supplements the institution's budget in the short term, but expensive programs like distance learning cannot be sustained without a long-term financial plan.

The finance landscape is similar at Regional University D. Debbie admits to having spent all of the money for the year for the instructional technology area and the new faculty center by March. She says finances seem unusually tight this year. To compensate for this, she intends to look for grants to subsidize her budget. Denise's pool

fares about the same. Her budget is small, but she needs equipment and personnel that are both expensive. Additionally, students do not have the technology resources they need to be academically successful, so she supplies all she can within the limits of the law, but sometimes circumstances get challenging. The relationship between her office and the IT office "has sometimes been a challenge" mostly due to perceptions that she is moving in on what they believe to be their territory, which is the larger computer labs. In one instance, a professor required a student with a disability to type a paper, but the student needed adaptive equipment that was not available in the computer labs serviced by the IT department. Instead of intervening and compounding the already difficult relationships, and perhaps delaying a solution for the student, Denise elected to have the professor make the technology upgrade request. Nothing happened. The following scenario unfolded:

> That didn't seem to work, I just kind of pushed it up [the] chain and said somebody has got to get this done, because if this student's grades suffer you may as well just say 'here, here's our check.' Do I think this student's likely to sue, no. But do I think this student would have every right and could win. Hands down. Sure. So, which way would you like to spend the money. Five minute of time from somebody from over in IT going over and fixing this or would you like to just go ahead and write the check because if you do, let's make sure it comes out of IT's budget. Not mine. They were over there the next day.

This scenario seems indicative of what it takes to get money spend on necessary adaptive technology outside of standard project management cycles.

Andrea sees herself as a natural advocate. As such, she spends a great deal of time working to educate others. She works with staff, faculty, and administrators, sending them to conferences, paying for online courses, and taking them to local speaking engagements so they can learn about web accessibility. Her motive is to persuade as many people as she can that web accessibility is the "right thing to do" because she knows she cannot accomplish the goal of helping the college become fully accessible by herself. In order to succeed, she will need help. To deal with the financial stress, she networks with others in the area to share resources. She also conducts her own personal research to learn more, so she can help her own resource center. Anne adopts many of the same coping mechanisms as Andrea.

In contrast, Angela's primary means of coping with the pressures of her position is compromise. Amy says Angela "appeases faculty" by looking for ways to not offend them. One way she does this is by focusing on learning styles instead of ADA accommodations in training sessions with the hope that she reaches some faculty who pick up on tips she tries to convey. She is "trying to find a good balance between what her office's needs and what the faculty needs are and the student's needs are." Another way she caters to faculty is that she does not check up on them. She looks at courses on an as needed basis. She sees 85% of courses at their inception, but there is very little follow-up. She also entertains "different opinions of what is accessibility. It is not always cut and dry - lots of gray."

When it comes to describing coping mechanisms, Barbara says it best - "I evolved." She first recited her long history with the college and how she came to be director of the center for students with disabilities. Doing her job is not easy as there are many different challenges on any given day, and flexibility is one key to success. She has discovered other keys to success as well. She goes to the public schools to recruit students and educate them and their parents. She also works very hard to get upper management involved in her projects. She spend a good deal of time working across departments to problem solve, for example securing better computer network access for Benjamin. She is also always networking and looking for ways to break the hierarchical barriers. She "feels good because she is finally getting to the appropriate people, and they are listening." Becky has many of the same coping strategies as Barbara, but she reaches out to faculty as well.

Brenda copes with the challenges of teaching faculty how to create courses with good design principles by focusing on learning styles. In her estimation, focusing on learning styles in the development of curriculum will help meet the goal of web accessibility because instructors will be focused on how to reach students. She claims, "The next logical step should be accessibility." She admits that it is often challenging to get faculty to attend training sessions because faculty recognize need for technology training, but not always for design." To accomplish this goal, she disguises session titles as technology-related sessions, so they do not feel threatened. Other strategies include making the learning curve as manageable as possible and raising awareness whenever she can.

Catherine deals with the challenges of no budget and increasing demands on her area by requiring more accountability from her co-workers and promoting greater independence in students. She also serves on various committees on campus, such as the ADA committee, to try to make positive changes. One example of a positive change is making environmental adjustments required by ADA, such as reducing noise in buildings and eliminating odors that might cause seizures. She also continually seeks options and alternatives to see what else can be done instead of settling for the status quo.

Denise copes with her difficult circumstances by getting involved. She also refuses to allow others to get by with the minimum necessary, so she points out accessibility problems wherever she can. This practice sometimes alienates others, but Denise does it for the benefit of the students she serves. She also knows people who are experts in the field of accessibility, and she does not hesitate to call on them for help if necessary.

Debbie has an equally challenging situation but for different reasons. Like Angela, the strong position of faculty on campus makes her job difficulty. Because they are concerned about the time and effort involved in making courses ADA compliant, Debbie also focuses on learning styles instead of ADA issues because she is concerned about their reaction to increased time commitments. She tries to win faculty over by using alternative formats, such as universal design. Her rationale is that overall, they will catch more accessibility errors than not by using universal design. However, it is important to remember that universal design is not synonymous with web accessibility. Lastly, Debbie, like Brenda, creates seminars with technology emphasis titles, and she advertises them as being hosted from the faculty technology center rather than from

instructional technology. If faculty believe the seminars come from IT, they will be less likely to attend because they "don't trust IT."

Web Accessibility "Watchdogs"

Andrea has managed to help create an environment at Community College A where change is occurring even though it is not as quickly as she might like it to be sometimes. Andrea "sees herself as a personal watchdog over accessibility on campus." She feels responsible because she has knowledge that others may not, and she feels she must share what she knows for the good of the campus and benefit of the students. Her strengths include her willingness to ask for help from others and to seek larger venues than her own for sharing her message. In other words, she was thrilled when upper level administrators joined the ADA committee because she felt the committee would finally have the ear of someone who could take information to another level where ideas and plans could be heard. The new face did not intimidate her; she embraced the new member as her presence opened new opportunities for change. Andrea also keeps an ear to the state legislature for news and updates and how they might affect the college. More than anyone else, her tenacity and boundless energy have helped Community College A move toward its goal of becoming the state's first web accessible college.

Denise has made something from nothing at Regional University D. For years, her predecessors assumed other positions in addition to ADA coordinator, but she has made it a viable, functional office with resources to serve students. When she came, the center had no assistive technology for students with disabilities who needed the equipment. That

has all changed due to her persistence and tenacity. Even though her office does not currently have good working relationships with IT, she does work with other departments on campus to help them rework their web sites to make them accessible to the students her office serves. One in particular was completely inaccessible a year ago, but with her help, they have made enormous strides. The personnel in that office have become so aware of how they can better serve students with disabilities that they have created a plan to phase out all tapes in their office and purchase new tapes with captioning or caption those tapes that cannot be replaced with newer captioned versions. Denise is hopeful that the enthusiasm of this office will someday catch on with other departments on campus.

Section Summary: Policy Implementation in Institutions

The agency acts as a barrier to implementation in several ways. The administration can interfere or prohibit activity as in the case of Angela and Anne at Community College A. Administrators prevent Anne from working with faculty and some departments' web pages to make them ADA compliant even though her job is the college web administrator, and her primary responsibility is to make the college's web site ADA compliant. Instead, Angela is supposed to work with faculty on accessibility issue, but she does not. As with the other institutions studied, little accountability and oversight exist at this institution. Both of these factors can hinder accessibility initiatives and put institutions at risk for litigation. Three respondents who worried most about litigation were two ADA coordinators, the watchdogs Andrea and Denise, and Brett, a dean of instruction, who considers himself a "barrier buster." Their concerns are that their

institutions are not doing enough to facilitate web access for students with disabilities even though it is required by law. Additionally, the faculty can help or inhibit progress, and the agency can neglect to create a plan of action for implementation. All of these elements were present at the institutions under examination.

The agency itself can either inhibit or facilitate policy implementation at the implementation stage. The administration itself plays a huge role. The community colleges offer the best examples. Community College A's administration supported an ADA committee, hosted conferences, supported training, and announced a plan of action whereas other colleges' administrations did not. In contrast, the notion of hierarchy was common among respondents at Community College B. Most of the respondents found the college structure restrictive, as if it kept them from doing their work effectively. Those who did not feel the hierarchy was restrictive were at more elevated positions in the college. Regional University C, like Community College A, also has an ADA committee, which suggests that the administration is supportive. I believe it is to a degree. There are many students with disabilities and faculty and staff with disabilities on campus as well. However, this was also the university that required I not only go through their IRB process, but the vice-president for academic affairs would not permit me to call any of my respondents myself. He made all of the calls to respondents' supervisors, and they called the respondents on my behalf. After their supervisors gave permission, I was allowed to contact the respondents. There is a great deal of administrative control on this campus where there is not the same degree or type of control present at Community College A. The administration at Regional University D seems supportive but not overly generous.

Another important element of agency influence is the amount and type of knowledge present among respondents. Those with the most knowledge about web accessibility turned out to be those who serve students with disabilities, not those who work with the technology and teach instructors to build web sites. Andrea and Denise were the most knowledgeable, followed closely by Brenda.

Problems with faculty were a common theme for all campuses. Regional University C and Community College B tie for 2nd place with Regional University D picking up the rear. They complained about the time and effort necessary to rework online courses that already existed. They would rather wait until a complaint has been made before addressing accessibility issues. I note earlier that all faculty at these campuses have tenure. One possible explanation for the prominence of voices at the community colleges is the excessive teaching load levied on instructors at this level as opposed to regional faculty. Community college instructors typically teach 15 credit hours (five classes) per semester during fall and spring sessions as part of their standard contract where regional faculty teach less. They also must serve on committees. Faculty may complain about time and effort to protect the demands already made on their time on campus.

The last agency barrier is an accessibility plan. Only Community College A had an accessibility plan. It was the product of its ADA committee led by Andrea. None of the other schools have a plan although Community College B personnel indicated that they might look into web accessibility issues within the next year. An accessibility plan could come from that effort. Regional University C is completely decentralized, so an existing plan or plan in the near future seems unlikely, and Regional University D is just

getting started with basic accessibility technology, so widespread web accessibility for students in online courses may be some time in the future.

All institutions suffer from financial woes. All respondents except two mentioned financial problems either in the form of money or resources like equipment replacement or personnel. The two who did not mention financial problems were Bob and Brenda from Community College B's distance learning area. The administration funds it very well, but does not share the same resources elsewhere on campus. Both Bob and Brenda indicated that funding for the replacement of outdated equipment as well as new equipment was well within their reach. They also indicated that they regularly travel to conferences to bring new ideas and materials to the campus for training purposes. The campus also funds Blackboard at Level 3, a high service level which costs more than $50,000 per year. All courses offered on campus have a Blackboard course assigned regardless of whether the instructor uses it or not, and support services are available around the clock. While students do pay technology fees to help offset costs, these services still cost the institution a great deal of money.

The use of coping mechanisms was fairly common across respondents though I expected to see more. Andrea, Barbara, and Catherine cope with the pressures and conflict in their jobs of serving students with disabilities by working to educate parents and students about services they offer. They also attend conferences, or if they have money, they send others to conferences. A popular coping mechanism was working across departments to problem solve and network. Denise follows these practices to some degree as well.

Angela, Brenda, and Debbie, all instructional technology personnel, have similar coping strategies too. One is compromise by looking for alternative means of teaching accessibility without actually teaching faculty about accessibility. They call it "focusing on learning styles." They also talk about finding balance and worry about what instructors think. Another common technique among them is to trick faculty into coming to training sessions on one topic when the faculty think it is really about something else. They feel trickery is the only way to get their jobs accomplished with some degree of success.

Finally, respondents enjoy personal success for different reasons. Two individuals stand out as prominent examples. Andrea has the backing of her administration. The college's commitment to being a high technology community college and first in the state to have an ADA compliant web environment for students will soon be a reality. She also has a global perspective that allows her to see the whole board and all players, and this ability has been key to her success.

Debbie's success is different though no less important. Due to her persistence and "country ways" she is plowing new ground at Regional University D with a relatively new ADA program. She has given the university a lot in only two years, and while she may be enjoying a honeymoon period of sorts now with the rapid growth, I anticipate her tenacity will carry the program much further.

Summary

Berman (1978), Lipsky (1969, 1980) and Weatherley and Lipsky's (1977) studies

of policy implementation are particularly useful for this study. Berman (1978),

Weatherley and Lipsky (1977) note different levels of implementers, and they claim it is

with the "street-level bureaucrats," those at the micro-level of implementation, that real

public policy is made. This concept held true throughout my research. Campuses proved

most successful in their accessibility plans because of the concentrated efforts of

individuals, not necessarily because of the institution as a whole.

All of the policy implementation theorists mentioned above (Berman, 1978;

Hargrove, 1975; Lipsky, 1969; Lipsky, 1980; Van Meter & Van Horn, 1975; Weatherley

& Lipsky, 1977) are interested in the institutions themselves a potential barriers to

implementation, they also look toward the behaviors of personnel as potential sources of

implementation problems. Like Weatherley and Lipsky (1977), Berman (1978) believes

that the policies are only implemented because of the efforts of the "street-level

bureaucrats" (p.20). He maintains that because of the nature of large organizations, they

have enough autonomy and local authority to make or break policy where it meets the

public.

Finally, another theme present among street-level implementers is that they

frequently develop coping mechanisms to deal with the uncertain nature of their

positions. These coping mechanisms are frequently unsanctioned by the institution

(Lipsky, 1980). Lipsky found that some street-level bureaucrats exhibited the following

behavior: did less work, were hard on subordinates, withheld resources from others, quit

their jobs, separated themselves from their work, and produced and passed on substandard work without comment. Weatherley and Lipsky's (1977) study of coping mechanisms notes that implementing personnel who develop their own coping techniques may "in the aggregate, constrain and distort the implementation" (p. 171).

While Weatherley and Lipsky (1977) focus more narrowly on the implementers as instruments or barriers of change, social systems theorists and organizational theorists such as Hall and Quinn (1983) and Beyer, Stevens, and Trice (1983) scrutinize the implementing organizations. Educational institutions have little discretionary money in comparison to their general operating budgets which makes implementation of any unfunded mandate difficult (Berge & Muilenburg, 2000). The common response is to improvise in order to meet the spirit of the law in the best way possible with what they have. This sometimes means interpreting the law in ways that cost the least amount of money, yet still remain marginally compliant (Giedosh, 2000; National Council on Disability, 2000a; Rothstein, 2000; U S. Department of Education, 1997b; Zigler & Muenchow, 1979). The lack of institutional resources and creative interpretations of what is required by law were two common topics during interviews with respondents.

Chapter Summary

This chapter analyzed study data through the lenses of social systems theory, particularly loosely coupled systems, and policy implementation theory. A description of data organization, management, and analysis strategies for the study was provided. Next, each institution was examined using pertinent components of social systems theory and

loosely coupled systems that emerged as themes throughout the study. These included

role conflict, role behavior, multiple role conflict, and subsystems. Within the discussion

of subsystems, each institution was examined for specific components of Weick's (1976)

loosely coupled systems theory. Finally, specific elements of policy implementation

theory were applied to the data for analysis. Themes emerging from analysis included

agency barriers to implementation, lack of resources, coping mechanisms, and individual

success stories.

Chapter V

Summary, Conclusions, Implications, and Commentary

This chapter includes the summary, conclusions, and implications for further research and practice. The usefulness of the theoretical lenses for the study also addressed, and the research question is discussed. The chapter closes with commentary.

Summary of the Study

The purpose of this study was to determine precisely what four higher education institutions in Southwest are doing to accomplish that goal. The research question examined is as follows: What are designers of web-based distance education courses doing to accommodate adaptive technology aids for students with disabilities? The examination was accomplished by collecting and presenting data from each institution, and presenting an analysis of the data using the theoretical lenses of social systems theory, loosely couple systems, and policy implementation theory.

To discover what colleges and universities are doing to facilitate web accessibility for students with disabilities who use assistive technology, I interviewed 19 respondents from four institutions, two regional universities and two community colleges. The schools were chosen based on two criteria: 1) the number of students they have with the following disabilities that are more likely to require assistive technology to access asynchronous online courses: ortho/mobility, deafness, visual, and brain injury, and 2) the number and variety of distance education courses offered. Participants at each institution were purposively selected based on their position at the university, or they were recommended by more than one respondent. Documents gathered for research include college catalogues, campus newspapers, printed schedules, pages from campus web sites, and materials from various offices visited during trips to various campuses.

Respondents. The respondents in this study were in one of three categories: instructional technology/distance learning, student disabilities coordinator, or chief academic officer. Instructional technology/distance learning respondents held positions ranging from trainers to the dean of distance learning. Student disabilities coordinator personnel held positions serving the deaf and hard of hearing populations and the rest of the student population with disabilities. Two individuals in this category were technology specialists. The chief academic officers were from one community college that had four campuses. They were chosen because their campuses were notoriously steeped in

149

technology. One respondent in particular was an early adopter of online courses before distance learning became the popular means of course delivery that it is today.

Data Presentation

A review of the related literature was presented on social systems theory, loosely coupled systems, disability studies, pertinent legislation, and policy implementation theory. The review of literature also included the topics of information technology and the pursuit of equal access and higher education and distance education. Data from the study were collected, coded, sorted, and presented first according to institution and by respondent and then by themes that emerged in the data analysis process. Themes emerging through analysis included concepts present in social systems theory such as role conflict, role behavior, multiple role conflict, and subsystems. Each college was also analyzed for specific elements of Weick's (1976) loosely coupled systems theory. Finally, themes related to policy implementation theory such as agency barriers to implementation, lack of resources, coping mechanisms, and individual success stories were presented.

Findings

Findings include many instructional technology and distance learning personnel are unclear about what constitutes web accessibility for students with disabilities who use assistive technology. According to this research, they do not demonstrate a good

understanding of the principles of accessible design and appropriate accommodations. Other findings include that most institutions address accessibility complaints on a case-by-case basis, which is not, according to the Office of Civil Rights, how complaints should be addressed (Patrick, 1996). According to instructional technology participants, the prevailing attitude is that they will deal with the problem when the problem arises. They also feel, for the most part, that the current state of accessibility in their distance learning programs is working well. Additional findings reveal how institutions fail to provide online access for students with disabilities who use assistive technology in expected and unexpected ways. Expected ways include the lack of resources, little oversight, and challenging relationships among groups on campus. Some strained relationships among staff groups hinder accessibility efforts on campuses whereas loosely coupled systems help facilitate accessibility initiatives on others. Unexpected ways institutions fail include fostering faculty autonomy at the expense of ADA compliance, ADA personnel discouraging students with disabilities from online course enrollment, and the lack of proper knowledge and training provided to faculty by distance learning and instructional technology personnel. Finally, campuses that have "watchdogs" are more successful with web-based initiatives than those without these guardians of accessibility efforts.

Expected Institutional Issues. Policy implementation theory considers the ways in which institutions and people help or hinder the implementation of policy. In this study, the institutions and the people who work for them inhibit web accessibility for students with disabilities who use assistive technology in predictable ways. Expected ways include

151

the lack of resources, little oversight of policies, procedures, and existing law, and challenging relationships among groups on campus. The financial picture on each institution visited has its challenges, some more so than others, but respondents except one distance learning department feel the pain of tight budgets. This means that resources typically go toward meeting the daily needs of the institution.

In many instances, there was little oversight of policies and procedures that govern web course development, which affects access for students with disabilities. Once the courses are created, often without instruction on how to create an ADA compliant course, they are rarely, if ever, supervised for quality or compliance with school, never mind federal, policies. Finally, challenging, if not difficult, relationships on campus make working toward the goal of online accessibility laborious. On one campus, administrative officials knew about the difficulties, but they did nothing to intervene.

Unexpected Institutional Issues. The study revealed unexpected ways institutions fail to assist with accessibility efforts. At most of the institutions visited, they foster faculty autonomy at the expense of ADA compliance for online courses. All three instructional technology personnel, Angela, Brenda, and Debbie, felt faculty autonomy prevented them from more actively pursuing accessibility in the online environment. It is useful to examine the relationship between faculty and the instructional technology personnel with Weick's (1976) loosely coupled system theory, especially the notions of lack of oversight and the seeming lack of rules. The laws exist by themselves, the faculty body exists by itself, and the online learning environment by itself. It seems that the three could continue to remain separated by broken coupled systems. However, An awareness

of accessibility exists, which is evident by some instructional technology personnel couching accessibility initiatives in terms of learning styles lessons for faculty, so they will attend training sessions.

Furthermore, ADA coordinators actively discourage students with disabilities from online course enrollment. Finally, distance learning and instructional technology personnel either do not have the proper knowledge or do not provide the proper training to faculty and other course designers to make online courses accessible for students with disabilities who use assistive technology.

At all of the schools visited, faculty occupy a very powerful position, so much so that instructional technology personnel would rather not talk with them about accessibility matters. I heard many times that faculty do not want to invest time and effort into reworking a site they have already created to make it accessible to a student with special needs. Another argument presented was that faculty have enough reservations teaching online that they can only learn so much, so asking them to learn how to create an accessible site is an unreasonable request and constitutes a burden on the faculty member. The situation is so challenging on one campus that the web master, whose job is to make the campus web site ADA compliant, cannot touch faculty pages. The administration has given the faculty two years to come into line with the rest of the college's ADA plan.

An equally unexpected finding is the notion that ADA coordinators would actively discourage students with disabilities from enrolling in online classes. Two of the five admitted to actively discouraging students' enrollment, and three of the five (Barbara, Becky, and Chip) agreed that students were more comfortable in a campus class where they had face to face contact with an instructor. Becky, who only agreed with

this assessment, but did not discourage students' enrollment, serves deaf and hard of hearing students instead of the general students with disabilities population like Catherine, Barbara, Chip, and Carrie. Catherine explained that deaf and hard of hearing personnel tend to encourage, even push, independence on their students in order to prepare them for the "real world." Catherine's statements imply that Barbara and Chip do not foster as much independence as a general rule. Barbara and Chip claim that the students needed one-on-one attention and the comfort of being able to ask questions and get an immediate response. For as much as the coordinators complained about not having access to many things, they seemed to play a role in denying their own students untold opportunities.

Finally, distance learning and instructional technology personnel do not provide training to faculty on web accessibility. I unsure at times if a few of them understood what I meant by web accessibility and assistive technology. Probing questions revealed that a few, in fact, did not. Others skirted the issue of web accessibility by focusing on learning styles with faculty in training sessions. Apparently, that topic goes over better in training sessions than legal matters.

Conclusions

Research revealed by this study reveals that higher education institutions may not doing enough to secure access to asynchronous web-based courses for students with disabilities who use assistive technologies. A significant disparity exists between what law requires and what occurs in practice. Research revealed in this study supports the

154

literature reviewed with regards to the Office of Civil Rights (OCR) positions on three important points.

First, college officials are addressing web accessibility on a case-by case basis. Second, most institutions have no plan for implementing accessibility measures in their online courses. The standard operating procedures appear to be a continued push for growth in all forms of distance education with little thought or planning for accessibility measures. Third, most of the respondents were unclear about what the law actually requires them to do. Fourth, there is a serious lapse in training for both faculty and staff with regard how to product an accessible web site. Finally, while national statistics show students with disabilities take online courses with considerable frequency, very few were actually enrolled in the four institutions in this study, which suggests something or someone is discouraging their participation.

The first conclusion that can be drawn from the evidence in this study is university officials are addressing online accessibility on a case-by-case basis. Respondents in instructional technology admitted as much to me. The general attitude is that if something comes up, they will handle it and move on. Part of the attitude seems to go back to the notion that they do not want to make waves with faculty by raising the issue of more time and work for making sites. It also ties in with the concept of perception of a problem. The general attitude among instructional technology personnel interviewed seemed to be that the lack of accessibility was not a high priority whereas it was a high priority, even an emergency, among student disability coordinators. University officials cannot address student complaints about inaccessible web-based courses on a case-by-case basis (High Tech Center Training Unit, 1999; Paciello, 2000;

155

U. S. Department of Education, 1998; Waddell, 1998). However, this is exactly what each of these institutions is doing in practice. Institutions will be held responsible for making online courses and resources accessible to students given that "cost could have been significantly reduced by considering the issue of accessibility at the time of initial selection of instructional avenues" (High Tech Center Training Unit, 1999; Paciello, 2000; U. S. Department of Education, 1998; Waddell, 1998).

Few institutions either create or rely on an accessibility plan. In fact, only one has a plan of action on record. Community College A had a plan, which was developed through the ADA committee and was approved by the president, to roll out accessibility measures across campus. Part of the accessibility plan includes web accessibility for online courses, faculty web pages, the campus web site, and department web pages. The committee developed the plan partly in response to widespread faculty outcry against being told they must make their faculty pages ADA compliant. Their response seems indicative of an underlying resentful attitude prevalent on the other campuses of having to do more work on a course in anticipation that someday, a student with a disability might need to access a page. Web accessibility does not work that way according to law. While colleges and universities are not expected to become compliant overnight, they are expected to show a good faith effort in moving that direction. Campuses that enjoy the greatest access success begin by changing the perception of when access efforts must begin in the course creation process.

Third, most of the respondents in the study were unclear about what the law actually requires them to do. It was clear from our discussions that many of them were uncertain what constituted assistive technology. They were also unclear about how to

provide appropriate accommodations in an online environment. A couple of the instructional technology personnel talked about learning styles when I asked them if they discussed accessibility with their instructors. They seemed to think if they discussed how to make the courses address learning styles, the courses would be accessible to students with disabilities as well. This misconception leads me to believe that the respondents lack a clear understanding of accessibility initiatives and universal design. Furthermore, in three instances the instructional technology personnel could not name the ADA coordinator on campus. Colleges and universities should have a clear understanding of ADA policy for the definition of effective communication and how that applies to delivering information online, particularly if they intend to compete in the realm of distance learning. This study reveals that some key college personnel do not have a clear understanding of these principles, and some of these individuals are responsible for training faculty who build online courses.

No institution made accessibility training a priority when training faculty to build courses. While one institution had a reasonably well organized training program, it did not address accessibility measures at all. These findings suggest that trainers do recognize certain topics as higher priority topics over accessibility at the moment, and that perception must be corrected. The responsibility for training faculty about the ways in which to make an online course accessible for students with disabilities who use assistive technology lies with instructional technology and distance learning personnel, and they simply did not provide it among the institutions studied. Even though instructors create the overwhelming majority of the online courses, most must still be trained at some point by staff how to accomplish this task. Two possible scenarios explaining the lapse in

training present themselves. Faculty have tenure on all campuses I visited, and this research revealed they wield a notable degree of power on their campuses. Staff could be afraid of losing their positions or favor with faculty if they engage in unpleasant activities with faculty. Most indicated that asking faculty to do something else, such as learn the principles of creating an ADA compliant web site, would create an undue burden on instructors' time. An undue burden in cost, time, and effort constitutes an example of the previously mentioned unpleasant activity. Another option is staff could be afraid of losing their position or favor because of an administrative mandate to grow distance learning offerings, which is a notorious moneymaker for institutions. Therefore, it is in the staff's best interest to keep faculty happy. Either way, staff believe themselves to be in an untenable situation where they must cater to faculty, "to appease them" as one staff member said. Either scenario calls for a change in administrative perspective that allows such behavior to continually put institutions at risk for litigation. If faculty are going to continue to create and maintain online courses, they should receive proper instruction on how to make those courses accessible to all students, including students with special access needs.

Another important conclusion regarding students can be drawn from this study. National statistics show students with disabilities take online courses (Edmonds, 2003). This study revealed that very few students were actually enrolled in online courses. Out of four institutions with a combined student population of approximately 74,000 students, fewer than 15 students with disabilities were enrolled in online courses, and 10 of those were at one institution. It is possible that the national statistics include students with learning disabilities, which would dramatically inflate the total number, which would

mean that in reality, not that many students with disabilities who use assistive technology really take online courses at these institutions, so the turmoil over web accessibility is overstated a bit. Another possible explanation is that regionally, Southwestern students are simply less technologically advanced than other students with disabilities in the United States. A more likely answer is found in the actions of those who are supposed to teach them independence and how to function well in society. The study revealed that several coordinators of offices for students with disabilities actively discouraged their students from enrolling in online courses. They claimed that the students need face-to-face interaction with instructors to get immediate feedback, and they feel more comfortable in a classroom, and the students apparently did not challenge the enrollment recommendations. It seems a great disservice to deprive students of an educational opportunity and the opportunity to learn skills, how to use technology to serve their needs, that will help them long after they leave the university.

The last inference drawn from the evidence is that successful web accessibility efforts on college and university campuses are not driven by instructional technology people who build online courses and train others to do the same. These efforts are driven and fueled by student services people who serve the students with disabilities who might take the courses. The strongest advocate and biggest force for moving web accessibility forward on each campus was the student disability coordinator, not a technology person. These efforts manifested themselves in tangible terms. Andrea created the ADA committee at Community College A and helped get the plan in motion that changed web accessibility on campus for the entire web site. Within two years, every web page, including faculty pages, will be accessible to students with disabilities. There is an

Andrea on every campus visited during this study. The technology persons' efforts pale in comparison.

One topic not explored in this study, but relevant to the outcomes of the study, is that of the trend of state legislatures for passing laws that compel state agencies, including public postsecondary institutions, to make their electronic and information technology accessible for people with disabilities. These mandates include web-based courses. Currently, approximately than 14 states have such laws, Southwestern included (B. Dawes, personal communication, June 15, 2005). Part of Southwestern's legislation compels state agencies to report on the state of their compliance efforts one time per year. Part of that report must be a progress report, which indicates plans for the future over a three-year rollout period. The legislation, which is largely modeled after federal standards Section 508, also spells out requirements for accessibility on many things including web accessibility. It seems the days where state agencies, including colleges and universities like those studied here, could make web accessibility a lesser priority are numbered.

Social Systems and Policy Implementation Theories

Curious readers may ask: *How useful were social systems and policy implementation theories in discovering what designers of web-based distance education courses are doing to accommodate adaptive technology aids for students with disabilities?* Social systems theory was very helpful for exploring respondents' roles on campus and explaining their sometimes puzzling behavior. The concept of loosely

coupled systems was helpful for explaining relationships on campuses, some of which were admirable while others were regrettable.

Policy implementation theory was useful in an unexpected way. It helped explain the agency as a primary barrier, but I expected it to help better define the individuals and their role in implementation success and failure. What I discovered was that it was consistently useful for exploring the institutions as implementers, but inconsistently useful for exploring the respondents. For example, because coping mechanisms is a dominant theme in the policy implementation theory, I anticipated the notion of coping mechanisms being much more prominent in the study than it turned out to be.

Implications

This study has implications for theory, research, and practice. Social systems and policy implementation theories were applied to the study of web accessibility for students with disabilities for the first time. The study enhances what we know about students with disabilities in higher education and in distance learning. The study has significant implications for practice in institutions.

Theory

Prior to this study, social systems and policy implementation theories have not been used as theoretical lenses for a study of web accessibility for students with disabilities who use assistive technology. These lenses proved valuable tools for

analyzing the factors that help or hinder policy implementation. The addition of loosely coupled systems as a third lens for analysis proved invaluable for revealing why a particular institution enjoyed as much success at policy implementation as it did.

Research

Previous distance education research has focused on a number of topics ranging from the quality of education to access for the poor and minorities. The purpose of the research to date has been primarily used to inform decision making about policies and procedures on campuses. Research on distance learning or online learning and students with disabilities is limited. Research that uses social systems and policy implementation theory to discover what colleges and universities are doing to increase access to web-based courses was not found. This study has attempted to begin a new line of research. An investigation of instruction technology personnel, distance learning personnel, and student disability coordinators' practices with regard to web course access will build on what little we know about students with disabilities' distance learning experiences. It will add to what we already know about web accessibility.

Practice

All but 9% of public colleges and universities offer some form of web-based or web-enhanced instruction (U. S. Department of Education, 1999), and recent research indicates that one out of every 11 college freshmen in the United States has at least one

diagnosed disability (Rothstein, 2000). This means that the likelihood is high that institutions will encounter accessibility issues if they do not behave proactively and train faculty and other course designers to build accessible asynchronous web courses from the ground up. This also means crafting a plan to rework old courses to make them compliant as they are revised, which is the generally accepted practice by the aforementioned state legislatures. To accomplish these goals, university personnel might begin with the following questions:

1) What training is necessary to bring course designers up to date on current web accessibility practice?

2) Who needs training? How can training best be delivered?

3) Who will be responsible for accessibility oversight?

4) What barriers to accessibility initiatives need to be removed?

5) What resources need to be allocated to facilitate accessibility initiatives?

6) What resources need to be allocated to support these efforts?

Institutions in this study that are the most successful at web accessibility efforts enjoy that success largely because of the efforts of a few key people. An excellent example of the principles behind some of these questions in practice can be found in Andrea, and to some extent in Denise. One reason Community College A enjoys the degree of web accessibility they have is largely due to Andrea's leadership. She recognized the problem as a problem and set out to determine what training was necessary and who among the faculty she could co-opt and send to training. She brought speakers to campus and sent selected faculty to training, knowing they were influential among their peers and would come back and spread the knowledge they had gained.

Andrea also "feels responsible" for web accessibility because she knows the way it is supposed to be for students. Anne feels similarly, and together they work with the ADA committee to remove barriers to the campus-wide accessibility initiative. One of Andrea's primary missions is to continue to "increase her sphere of influence," which is part of the accessibility success of this institution and the root of the loosely coupled system on this campus.

Future Research

Originally, this study was to focus on individuals I thought would be accountable for web accessibility, namely instructional technology directors. At my dissertation committee's suggestion, the scope was broadened to include people instructional technology directors work with, such as other related distance learning personnel and ADA coordinators. This proved exceptionally good advice because in that broadened scope I learned that, in the instance of this study, ADA personnel are more often than not responsible for raising web accessibility awareness. The study suggests four important areas for further research: students, faculty, ADA coordinators, and administrators.

Students

Several respondents claimed to speak for students when they voiced the opinion that they were better off in campus classes rather than distance learning classes. One potential study should investigate the students themselves. Kim-Rupnow, Dowrick, and

Burke (2001) remark that we know little about students with disabilities in distance education because we do not have a clear picture of this group of students or how to contact them. As this study suggests, for whatever reason, they may not appear in distance education courses or online courses in large numbers. An investigation of students could pose the following questions.

1) How do you use assistive technology?

2) Do you use the Internet? For what purpose? How often?

3) If you have taken online courses at your school, describe that experience. If you have not, please explain why not.

4) Compare/contrast your experience in an online class with experience in a campus-based class.

Faculty

Another possible area for future research involves the faculty who create, moderate, and manage the web-based courses. This study revealed several interesting things about faculty on the campuses I visited. They hold remarkable positions of authority over the staff members who teach them about distance learning. The dynamics of this relationship proved very intriguing to me because in each instance, it interfered in detrimental ways with web accessibility for students with disabilities who use assistive technology. I am a faculty member who develops courses for web delivery, and this phenomenon puzzled me. A study designed to investigate whether this phenomenon is

widespread or isolated might consider the following questions for instructors who develop web-based courses.

1) What do you know about web accessibility for students with disabilities?

2) Describe the instruction you receive on how to build your online course.

3) How much time do you think you spent creating your online course(s)?

4) How much time and effort are you willing to invest in making your online course accessible for students with disabilities who use assistive technology?

5) Characterize the relationship between faculty and staff, especially instructional technology personnel.

6) What do you see as barriers to web accessibility initiatives?

7) What you help increase faculty buy-in to web accessibility efforts?

ADA Coordinators

Finally, three of the four ADA coordinators I met actively discouraged their students from enrolling in online courses. This practice both surprised and bothered me. A few claimed the students were more comfortable in campus classes because they needed the individualized attention, but their actions seemed to contradict their purpose of making their students independent. It also made me wonder if their actions were why I did not see as many students with disabilities in online courses, and I wondered if this was commonplace. A research study designed to determine if such behavior is common might consider the following questions.

1) How many students with disabilities who use assistive technology do you currently serve in your program?

2) How many of your students currently take online classes? Of that number, how many of them are students who use assistive technology?

3) What do you do to encourage independence in your students?

These topics should yield rich future research studies that will add to the discussion of students with disabilities in higher education and the topic of distance education.

Administrators

The lack of administrative oversight for web accessibility initiatives was an important finding in this study and merits further consideration. One lens for the data that might have helped explore this issue is situational leadership. In light of the issues surrounding roles that manifested themselves in this study, situational leadership theory could have been a useful lens through which to explore administrative responses to questions about situations on campus of which administrators may or may not have been aware. Situational leadership puts forward the notion that different circumstances require different leadership approaches. The Hersey-Blanchard is one situational leadership model that consists of four leadership styles, which are "directing, coaching, supporting, and delegating" (Hadden & Davies, 2002, p. 256).

It would have been useful to include higher level administrators in the sample who have decision making powers about financial issues on campus. Situational leadership appeared to play a role in financial decisions where some areas on campuses

167

were adequately funded whereas accessibility efforts were not. It would have been interesting to explore how they made those decisions. Situational leadership theory also explores employees' perceptions about their own work. Blanchard and Nelson (1996) consider employees' attitudes about work and explore the most effective motivators at what they consider the four levels of employee engagement: "enthusiastic beginner; disillusioned learner; capable but cautious contributor; self-reliant achiever" (p. 1-2). These areas for further research should yield considerable data for further discussion.

Commentary

I have been a faculty developer of web-based courses. There was a time when I did not know about accessibility measures for students with disabilities. Unless someone tells us, we do know necessarily know, but once the word is out, it is our responsibility to provide access for students with disabilities just as we would in class. Perhaps this is even truer for two reasons: 1) because of the policies being formed by Office of Civil Rights cases stipulating that colleges and institutions should not make accommodations for students on a case by case basis, and 2) it is more efficient to create a compliant site from the beginning than it is to have to go back and rework a site after the fact.

The struggle for equality of all kinds has been fought a long time, and in new and amazing ways, the argument creeps up again. For people with disabilities, equal access to the work force, politics, health care, higher education, and more is improving, but this study demonstrates yet again that preconceived notions, unyielding attitudes, and institutional red tape sometimes still stand between them and what is rightfully theirs.

168

Part of the purpose of this study was to investigate what college and university personnel are doing for students with disabilities who use assistive technology to access web-based courses. The other, perhaps most important, part is to raise awareness for what work remains ahead.

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Appendix A

Interview Protocol

1. Describe your personal experience with web accessibility as it relates to assistive technology and students with disabilities.

2. What is your philosophy regarding the role your office plays in facilitating web accessibility for students with disabilities who use adaptive technology on your campus?

    *   What resources on campus help you assist students with disabilities enrolled in web-based courses who use assistive technologies?

    *   Describe the nature of the relationship between your office and _____.

    *   Who designs and maintains the web-based courses on campus? What are the basic requirements of each course? Can you describe some of the sites, from basic to more elaborate?

3. How is information communicated to you about web-accessibility initiatives? From where does the information come?

    *   How do ADA laws, particularly the 1996 U. S. Department of Justice Ruling, affect your standard operating procedures regarding web-based course creation/maintenance and student accessibility efforts?

4. Some have suggested that accessibility guidelines restrict instructors' creative freedom in course (Olson, 2000)? What do you think?

5. What is your perception of universities' commitment to accessibility to web-based courses for students with disabilities who use assistive technology? What about your university?

187

- Do you know if you now or if you have ever had students with disabilities who use adaptive aides enrolled in web-based courses? If so, how do you know?

- Have web-accessibility issues been raised on other campuses that you know about? If so, what issues were raised? Were they/how were they resolved? What about your campus? Were they/how were they resolved?

Appendix B

Letter of Entry: Administrators

The purpose of this letter is to request permission to solicit the participation of college and university staff in an important doctoral study of web designers and their experiences with adaptive technology and college students with disabilities who take web-based courses. The study is directed by Adrienne Hyle, Ph.D., Oklahoma State University and Teri L. Ferguson, a doctoral student at Oklahoma State University.

Your campus was selected because it enrolls a proportionally higher number of disabled students who may need adaptive aids to access web-based courses and because your campus offers more distance education courses than institutions of comparable size with similar populations of students with disabilities. The knowledge, experience, and expertise of your staff will be used to enhance a sparse knowledge base regarding students with disabilities who use adaptive aids to access web-based courses. The study's goal is to understand institutional issues involved in web accessibility for students with disabilities who use assistive technology.

The benefits of this proposed study are many. It will contribute to a growing body of literature and research on distance education, and it will enhance existing literature on the issues regarding adaptive aids in that realm. The research is important because it will hopefully yield valuable insight to help teachers, staff, and administrators better serve students with disabilities who rely on adaptive aids as they pursue their education.

I appreciate your willingness to participate in this study. Rest assured that fictitious names will be used in all verbal and written records and reports for you, your institution, and any interviewed employees. If you have any questions or concerns, please feel free to call me at work (405) 945-3392, or email me at mteri@osuokc.edu. You may also call Sharon Bacher, IRB Executive Secretary, Oklahoma State University, Stillwater, OK, at (405) 744-5700, or email her at sbacher@okstate.edu for further information. You may also contact Dr. Adrienne E. Hyle, my dissertation advisor, at (405) 744-9893, or email her at aeh@okstate.edu.

Respectfully,

Teri L. Ferguson

Appendix C

Consent Form for Administrators

I have read and understand the "Letter of Introduction to Administrators" which describes research by Teri L. Ferguson on instructional technology directors and other campus personnel's experience with issues related to web-based courses and assistive technology for college students with disabilities. I understand the research purpose and process, and I know safeguards to preserve confidentiality will be employed at all stages of the research and reporting process. Initial interviews will last approximately 1 hour and may be followed by a second shorter interview (by phone or in person) to ask questions for clarification if necessary. Participation in the study by campus personnel should last no longer than six months.

I know that I may ask questions at any time about the nature of the research and the methods used. I may contact Teri L. Ferguson using the information provided below. I may also contact Oklahoma State University's Institutional Research Board's Executive Secretary for more information regarding the study.

The researcher, Teri L. Ferguson, guarantees that the following conditions will be met:

1. My real name will not be used at any point of information collection or in the report. The institution and all study participants will be given fictitious names that will be used in all verbal and written records and reports.
2. If study participants grant permission for audiotaping, no audiotapes will be used for any purpose other than to conduct this study. The tapes will be transcribed either by the researcher or by a trusted colleague and will be kept in a secure environment. No record will include names.
3. Tapes and transcripts will be kept in a locked file accessible only by the researcher. All tapes will be destroyed at the conclusion of the study.
4. Participation in this study is completely voluntary; I have the right to withdraw the campus from participation at any time, for any reason, and without any damage or injury to the institution, participants, or me.

Do you grant permission for Teri L. Ferguson to conduct research at your institution?
Yes_____No_____

Signature of the participant _____ Date_____
I agree to the terms indicated above

Teri L. Ferguson   Sharon Bacher
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Appendix D

Letter of Introduction to Study Participants

The purpose of this letter is to request your participation in an important doctoral study of web designers and their experiences with adaptive technology and college students with disabilities who take web-based courses. The study is directed by Adrienne Hyle, Ph.D., Oklahoma State University and Teri L. Ferguson, a doctoral student at Oklahoma State University.

Current literature documents both an increase in higher education's use of distance education and an increase in the enrollment of college students with disabilities who might rely on adaptive technology to access web-based material and courses. This study seeks to answer the following research question: What do web course designers do to accommodate adaptive technology aids for students with disabilities?

To answer this question, the study will explore the following subsets of questions: 1) What are college and university policies regarding compliance initiatives for the 1996 U. S. Department of Justice ruling which says that ADA law applies to Internet activities for higher education institutions? 2) What are colleges and universities doing to make existing web-based courses accessible to students with disabilities who use adaptive technology? 3) What do pertinent campus personnel think are the most promising organizational/environmental and personnel oriented facilitators toward implementation? 4) In their estimation, what do relevant campus personnel believe are the most critical environmental and personnel oriented barriers to compliance implementation? 5) What are the philosophies of key offices in the study regarding the role they play in facilitating web accessibility for students with disabilities who use adaptive technology?

You have been selected for participation in this study because you are either an instructional technology director, another party responsible for web-course creation and maintenance on your campus, or someone who coordinates services for students with disabilities. Your campus was selected because it enrolls a proportionally higher number of students with disabilities who may need adaptive aids to access web-based courses. The campus was also selected because it offers more distance education courses than institutions of comparable size with similar populations with students with disabilities. Your knowledge, experience, and expertise will be used to enhance a knowledge base regarding students with disabilities who use adaptive aids to access web-based courses that is currently very sparse. The study's goal is to understand the issues involved in web course design for accommodating adaptive aids for college students with disabilities.

The study will consist of an initial personal interview of approximately 1 hour on your campus or mutually agreed upon location and a follow-up interview (by phone or in person) with the option to ask questions for clarification if necessary. Your participation is strictly voluntary, and you may cease participation at any time without consequence. Your identity and the identity of your institution will be protected at all times in the presentation of the research through the use of coded names for both.

The benefits of this proposed study are many. It will contribute to a growing body of literature and research on distance education, and it will enhance existing literature on the issues regarding adaptive aids in that realm. The research is important because it will hopefully yield valuable insight that will help teachers, staff, and administrators better serve students with disabilities who rely on adaptive aids as they pursue their education.

I appreciate your willingness to participate in this study. If you have any questions or concerns, please feel free to use the contact information provided below.

Respectfully,

Teri L. Ferguson

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Appendix E

Consent Form for Study Participants

I have read and understand the "Letter of Introduction to Study Participants" which describes research by Teri L. Ferguson on instructional technology directors and other campus personnel's experience with issues related to web-based courses and assistive technology for college students with disabilities. I understand the research purpose and process, and I know safeguards to preserve confidentiality will be employed at all stages of the research and reporting process. The initial interview will last approximately 1 hour and may be followed by a second shorter interview (by phone or in person) to ask questions for clarification if necessary. Participation in the study should last no longer than six months.

I know that I may ask questions at any time about the nature of the research and the methods used. I may contact Teri L. Ferguson using the information provided below. I may also contact Oklahoma State University's Institutional Research Board's Executive Secretary for more information regarding the study.

The researcher, Teri L. Ferguson, guarantees that the following conditions will be met:

1. My real name will not be used at any point of information collection or in the report. My institution, co-workers, and I will be given fictitious names that will be used in all verbal and written records and reports.
2. If I grant permission for audiotaping, no audiotapes will be used for any purpose other than to conduct this study. The tapes will be transcribed either by the researcher or by a trusted colleague and will be kept in a secure environment. I will be provided with a copy of the transcript in order to check for accuracy. No record will include my name.
3. The tape and transcript will be kept in a locked file accessible only by the researcher. All tapes will be destroyed at the conclusion of the study.
4. My participation in this study is completely voluntary; I have the right to withdraw at any time, for any reason, and without any damage or injury to myself.

Do you grant permission to participate in this study?
Yes_____No_____

Do you grant permission to be audiotaped?
Yes_____No_____

Do you grant permission to be quoted directly?
Yes_____No_____

Signature of the participant _____ Date_____
I agree to the terms indicated above

194

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Appendix F

Site and Participant Overviews

This multiple case study had a purposive sample. It was chosen based on two specific criteria: 1) the number of college students with certain types of disabilities who would need assistive technology to access distance education courses, and 2) the number of asynchronous online courses offered by the institution in an academic year.

There were 19 participants for this study from four institutions. Four institutions were used for the study, and two were used for the pilot study. Nineteen participants were interviewed, with two pilots, but two of the 19 interviews had two persons each for a total of 23 total participants. The institutions have been labeled A through D for easy tracking for readers, and the respondents for each institution have been given pseudonyms beginning with the corresponding letter of the institution where the work. See Table 1 for a comprehensive list of respondents, institutions, and their positions on campus. The pairs of respondents interviewed together are indicated in the table by corresponding asterisks (* and ** respectively).

Table 1

Study Participants

Participant	Position Held @ College

Community College A

Andrea	ADA Coordinator/Disabilities Director
Angela	Coordinator of Instructional Technology and Online Learning
Amy	Director of Tele-Learning
Anne	Web Master

Table 1 (continued)

Participant	Position Held @ College

Community College B

Barbara — Director for Center for Students with Disabilities

Benjamin — Computer expert for Center for Students with Disabilities

Bob — Dean of Distance Learning

Betty — Dean of Instruction

Becky — Coordinator for the Center for Deaf and Hard of Hearing Students

Brett — Dean of Instruction

Brenda — Instructional Designer

Regional University C

Catherine — Director of Student Services for Deaf and Hard of Hearing

Charles — Director of Distance Learning

Cindy — Director of Off-Campus Education

Chip * — Director for Student Support Services (ADA Coordinator)

Carrie* — Technology Assistant for Student Support Services

Chad ** — Technology Specialist (Title III)

Charlotte ** — Title III Grant Administrator

Regional University D

Debbie — Assistant Director, Academic Technologies and Training

Denise — Disabilities Support Services Coordinator

Donna — Distance Learning Coordinator and Co-designer for faculty courses

197

Community College A

Community College A is an urban community college with a campus population in 2003-2004, the year of this study, of approximately 19,700 students. It is not the only community college in its city, which is the largest city in the state. There are other two-year campuses within 30 miles of the campus. Community College A's mission is to serve the people of that part of the state by offering education to prepare students to compete in an increasingly global community and economy. The college accomplishes this goal by focusing on student achievement and doing what they can to influence students' lives. Andrea, director for the center for students with disabilities, also notes that the college prides itself on being a leader in the use of education technology. Community College A offers only associate of arts, associate of science, and associate of applied science degrees, but it does have articulation agreements through the state regents, so students may transfer to continue their schooling elsewhere. The college also awards certificates of mastery in some fields. Degree programs vary widely from theatre arts to surgical technology to computer programming to finance.

Community College A served 348 students with disabilities during the 2003-2004 academic year. According to Andrea, it is very difficult to determine how many of these students used adaptive technology to access web-based course material because they do not have to come to her office, the student disability coordinator's office/area, to use the technology. The college has been proactive in ensuring there are adequate facilities in multiple places on campus for students' access, which makes it convenient for students and facilitates their independence. While Andrea completely supports this practice, she

198

admits it makes it difficult to track how, where, and in what way many students use the technology. According to Angela, instructional technology director and director of online learning at the college, Community College A offered 212 online courses, which includes online and web-enhanced, during the 2003-2004 academic year.

Access to this community college went very smoothly. The administration requested a summary of my proposal and offered free access to the campus. In fact, they were very helpful in providing campus contacts for the Office of Institutional Research in the event that I needed additional assistance. Once the institution's chief academic office gave his approval to conduct research, I made contact with potential participants who fit in the category of individuals of instructional technology director, ADA personnel, or academic administrator by phone and by email. I approached four individuals on this campus for interviews, and four responded.

Table 2 reports study participants and their positions for Community College A. Pseudonyms were given to all study participants. They were randomly assigned, but in alphabetical order according to the order in which the interview occurred during the course of the study.

Table 2

Study Participants, Community College A, Fall 2003

Participant	Position Held @ College
Andrea	ADA Coordinator/Disabilities Director
Angela	Coordinator of Instructional Technology and Online Learning
Amy	Director of Tele-Learning
Anne	Web Master

Andrea has been the disabilities coordinator since 1995. When she was first hired, there was no disabilities office on campus. Her predecessor was a counselor with a financial aid background who also counseled students with disabilities. In her words, "it was kind of a one man shop . . . the disabilities was just added on." Her background is in deafness, so she has a working knowledge of disabilities, but there was a steep learning curve when she first accepted her current position. At first, the center was funded with soft grant money, but funding for the center was later assumed by the college's budget. They now have a number of adaptive equipment and types of software and consider the center progressive in that area. Her main concerns for students at the moment are accessibility of the web, because so many use the Internet for just about everything, and appropriate funding. Other concerns include campus advocacy within faculty ranks when it comes to accessibility in online courses. According to Andrea, they are taking baby steps "to increase their sphere of influence," but they are not there yet. Andrea serves on the college's ADA committee.

Angela is the coordinator of instructional technology and online learning. She was initially hired to be the instructional technologist because her background is in instructional design, specifically in web-based materials. Faculty members develop most of the online courses on campus, and she manages the online program. She also conducts faculty training. Her academic background is quite varied, and she began developing web sites to teach with to accompany her classes in the late 1990s, so she has both design and online instruction experience. Her philosophy of good web design is simply that instructors should use simple, sensible web design strategies to be effective. She believes if designers do that most of the time they will meet accessibility guidelines. Her concerns

include meeting the needs of faculty and preserving their autonomy while suggesting principles of good design. Another concern includes mandating accessibility for courses regardless of whether or not students with disabilities enroll. She says "it is not our resistance to ever provide any information to the students, but it is being required to do that when you don't know it is absolutely necessary, and the amount of time that goes into changing it. That is where the faculty is concerned." She serves on the college's ADA committee.

Amy holds the post of director of tele-learning at Community College A, which means she is responsible for sending and receiving television courses at the college. She works with the faculty, training them and assisting them in teaching over the system. All of the tele-courses are pre-produced, and most of them are captioned when they come to campus. Instructors for the courses have a group of students in a studio at Community College A, and they send their course to another location. Amy says that a few of her instructors put their materials on WebCT for students to access. At the close of my research, the college was about to pilot an 8-week streaming video project where the online orientation is streamed, the syllabus is on the web, video lessons are streamed, and the review sessions are streamed. Amy's concerns were whether the students would have access to the material. Amy was quick to admit that she and Andrea's office cooperate regularly on student issues with access to course material. She also works with Angela's office for faculty related issues when the problem is a course site. Her concerns include procuring newer technology for students but making it accessible for them at the same time and the controversy between making faculty pages compliant and faculty's academic freedom. She, too, serves on the college's ADA committee.

Anne is the college's web administrator, and she is responsible for making the whole web site at the community college, except the individual faculty pages, ADA compliant. She makes sure it is updated daily. Her experience with accessibility comes from the federal government. Prior to working at Community College A, she worked for the FAA, and because, she says, the government is about a year ahead of everyone else, she already knew about the accessibility guidelines and web site compliance before it was an issue in her current job. She feels her superiors have been very cooperative, but others have not been so receptive. Faculty members have been resistant, and peers have been territorial. When asked if she collaborates with people who work with faculty, her response was, "I wish we could." Her immediate concerns are the lack of through web site compliance and outright lack of compliance among faculty web pages and web courses, which are out of her purview, and the liability that poses for the institution. Her mission is to create and maintain an easy to use and navigate web site for all users.

Community College B

Community College B is also an urban community college with a campus population in 2003-2004, the year of this study, of approximately 26,800 unduplicated headcount. It is the only community college in its city, which is the second largest city in the state. Community College B's mission focuses on excellence in education, whether students are degree-seeking or attending the college for workforce development or self-improvement, while creating a nurturing academic environment that will foster students' success. Community College B has four campuses that serve a diverse population, and

each campus has its own unique emphasis. One campus, for example, specializes in animal science, while the newest campus has a technology emphasis. Community College B offers two-year degrees like Community College A, but their tracks are differently organized. They have a degree track for students who come to the college with the intention of transferring to another school after completing their degree at Community College B. Another track of degrees is geared toward workforce development and specific careers, such as legal assistant or electronics technology or dental hygiene. Another track of degrees is devoted to cooperative agreements with corporate entities, such as the city itself and a large printing company, for example.

Community College B served approximately 530 students with disabilities during the 2003-2004 academic year. According to the director of the center for students with disabilities and the director for the center for deaf and hard of hearing students, there were 13 students enrolled in online courses during the fall 2003 semester. Both directors said their students recognize the value of having an instructor present in a classroom to answer questions, which makes online classes an unattractive option in the students' eyes. One director also said she believes most of their students do not have the adaptive technology necessary to access online courses at home, and those who do take the courses use the equipment in the lab near her office. For these reasons, she admits that she actively encourages her students to enroll in campus-based classes. According to Bob, dean of distance learning, Community College B offered 280 online courses plus another 500 web-enhanced courses during fall 2003.

This community college, the largest of all institutions in the study, requested that I submit a summary of my proposal for review before granting admission to conduct

research. Once the institution's chief academic office gave his approval to conduct

research, I made contact with potential participants who fit in the category of individuals

of instructional technology director, ADA personnel, or academic administrator by phone

and by email. I approached seven individuals on this campus for interviews, but one

individual declined. Another individual with the same job description as the one who

declined agreed to participate, and an additional person from the ADA office agreed to

participate for a total of eight interviews altogether.

Table 3 reports study participants and their positions for Community College B.

Pseudonyms were given to all study participants. They were randomly assigned, but in

alphabetical order according to the order in which the interview occurred during the

course of the study.

Table 3

Study Participants, Community College B, Fall 2003

Participant	Position Held @ College
Barbara	Director for Center for Students with Disabilities
Benjamin	Computer expert for Center for Students with Disabilities
Bob	Dean of Distance Learning
Betty	Dean of Instruction
Becky	Coordinator for a Center for Deaf and Hard of Hearing Students
Bob	Dean of Instruction
Brenda	Instructional Designer

Barbara is the director for a center for students with disabilities except those who

are deaf and hard of hearing at Community College B. Community College B has 4

campuses, and the center for students who are deaf and hard of hearing is housed at another campus and is managed by another individual, Becky. Barbara has been with the institution for 21 years and has seen it evolve. When she was first hired at Community College B, she started began taking notes for students with special needs. She later migrated into a counselor position until she eventually became the director. She feels there are many challenges to her position, including managing the needs of students in multiple locations. They have representatives at each location, but all needs are addressed through her office. The center does not have its own budget, but she is grateful for Benjamin, their technology specialist, who is becoming quite adept at writing grants for the adaptive equipment they need to support their students.

Another challenge is the number of students they serve, which is 200-250 per semester. Barbara feels students with disabilities come from high school better prepared knowing their rights as students, and she has to keep up with them and provide them access to the best education possible. They also face staffing restraints and problems with technology because the technology they purchase one semester will be quickly outdated. She feels fortunate to have Benjamin because he is not only skilled in working with the students and the adaptive technology, but he also works with staff. In fact, she was excited that a meeting had been set up between Benjamin and the distance learning department to help them see what web sites "sounded" like when read through a screen reader. The purpose of the meeting was to help impress upon them two things: the campus web site is inaccessible in several places and the problems are easily remedied. She was counting on the good reputation of the center to make headway with the distance learning group, but she knows that she faces people's fear of change and resistance to

new things. She is very conscious of the hierarchy on campus and where she fits in the hierarchy.

Benjamin works for Barbara in the center for students with disabilities. Barbara suggested I visit with Benjamin separately, and he agreed to speak with me. He is a technology specialist, and we discussed the various technology used in the center and how those applications work with the web-based platforms. He demonstrated several of them for me and helped me better understand how students use them and how they do and do not work with certain technology. We tested several pages of Community College B's web site, including the main page, and it was partially inaccessible to a screen reader, so a blind student would have a difficult time getting through the web site. In several places, students would not have been able to navigate the page properly or without great difficulty, and there were images without alternative text behind them. In this case, a screen reader would articulate "image" instead of telling the student what the image represents. We tested Blackboard, which is the course platform of choice for that school, and Blackboard was accessible. Benjamin does not have an account to access Blackboard or other course platforms, so he can test these tools. I used my own account, so we could perform these tests. We tested another platform called Educator, and it worked just as well.

The problem with low or no navigability is that a screen reader runs things together, which makes it difficult for the student to understand what is really being said unless the student goes back several times over the material. If the navigation devices are not easily accessible, the ability to go back again and again is not possible. Because Benjamin is so low on the hierarchy, he says cannot make the requests necessary to

suggest these changes though they could significantly effect students. Benjamin also

trains students who comes to the center to use the assistive technology when necessary.

He maintains that many students who come to the college do not already have their own

equipment.

Bob is the college's dean of distance education. He started as the director of

distance learning, and before that was the manager for media services at the college.

During his media services days, he was involved in distance learning because of tele-

courses as well as interactive television courses for the college. He has extensive

experience with online learning as well. The colleges uses Blackboard Level 3, which

means that all courses offered at the college have Blackboard sites automatically created

for them, whether instructors choose to use them or not. Some instructors use the sites

minimally while others maximize their use with handouts and links to the web. He

supports faculty's ability to design the courses the way they want to in order to support

their courses, but they offer instructional assistance with workshops and training. He

talked with pride about their training program where faculty get the help they need to

build their courses. All faculty have mentors who are on their campus. Mentors are full-

time faculty with experience teaching online. They assess potential online faculty

members' needs for training and recommend a series of workshops for them, all of which

Community College B provides in-house. He admits that they do not go back and

evaluate the sites after they have been created. Until the semester prior to my visit, they

had not done much with ADA information, but they had recently created a handout on

accessibility issues. He also acknowledged that questions probably were addressed on a

case by case basis. When questions are raised, he says, "We [will] look for ways to deal with that."

Betty is the dean of instruction at one of the campuses, which has an emphasis on the use of technology, of Community College B. Among other things, she runs the schedule for the campus and troubleshoots the schedule for the need for additional courses, including online offerings. She has many instructors whom she believes uses advanced technology in their courses, but she does not know how they handle the issue of accessibility. One of her concerns was an impending accreditation of their online degree programs in spring 2004. When I asked whether the college had addressed the issue of accessibility in their online services, such as tutoring, advising, and online course delivery in the self-study report she referred me to another office for a copy of the report because she could not locate her copy.

Becky is the coordinator for the Center for Deaf and Hard of Hearing at Community College B. She had only been with the college for a few months when I spoke with her. The Center for Deaf and Hard of Hearing is located on a different campus from the Center for Students with Disabilities, and it has been open for almost 15 years. The have all of the services expected of such as center, including interpreting, tutoring, captioning, real-time captioning capabilities, which gives students a court reporter-like print-out of notes from a class session. Compared to similar centers, they seem well staffed though the needs are great and, according to Becky, there just do not seem to be enough hours in the day to accomplish all that they need to accomplish. She is eager to learn more about the other Center's capabilities and what they have to offer students. She is acutely aware that many deaf and hard of hearing students do not consider themselves

208

disabled, which explains why keeping the two facilities separated is a common practice on many college campuses. She is also eager to talk with faculty and distance learning about accessibility through captioning. Her three top priorities for the coming year were building relationships on campus, seeking resources, and learning more about online accessibility. In fact, she admitted that she was excited when I called to set up an interview because she was hoping to learn as much from me as I might learn from her.

Brett is the dean of instruction on one of the campuses at Community College B. His primary responsibilities are to the faculty and staff at the campus. When I visited with him, he had only been in this position a few months, but he has been with the college for approximately 23 years. Prior to that, for almost two years, he was Associate Dean of Business and Information Technology and before that an instructor. Brett was the first faculty member to offer an internet-based course at Community College B, and he has continued to remain active on distance learning related committees ever since. When he began teaching online, in what he calls the "pioneering days," they were not even sure what software or hardware to use, but he is quite proud of the innovations the college uses today. This was around 1998, but he cannot be sure. When I asked him about his new role as an administrator and how he sees himself in relation to getting resources for faculty or working with the distance learning office, he said he is a "barrier buster, and when there is a problem . . . they can't handle [he] take[s] care of it . . . and make[s] sure . . . they get what they need." He held a positive view of the college's established policies and procedures for requesting new courses and obtaining training through the mentor program, as described by Betty. When I asked about the accessibility of online material on campus, he expressed marked concern over the online catalog, especially in light of

the college's upcoming accreditation visit. He also commented on the use of streaming video on campus in online courses.

While he does believe the Community College B is committed to students' success, he does not believe the college has an action plan that outlines what needs to be done towards making the online environment more accessible to students with disabilities who use adaptive aids. I asked him if ADA issues ever came up in committee discussions he mentioned, and he said that they did. They came up as a concern, but not as a priority.

Brenda is a faculty member and instructional designer. Her position is unique because her official title is an instructional designer in the distance learning office, but it is a faculty position with 100% release time for distance learning work with faculty. Her primary focus is instructional issues in the distance learning environment, but occasionally she works with interactive television and tele-courses. She describes her job as to help faculty design courses for online course delivery. She conducts a great deal of technical training, where she incorporates tips for good design, and she does some committee work as well. She also works with the campus mentors, which have been previously described. The platform she works with most often is Blackboard, but she also works frequently in Microsoft Word, helping faculty understand how it can be used as a powerful teaching tool when communicating with and offering feedback to students.

One of Brenda's overarching concerns is faculty's penchant to rely on the notion of academic freedom as they resist changing a poorly designed course in favor of one that is designed better. She finds faculty very defensive when it comes to their online courses. She admits, like Bob, that they had not addressed accessibility much at all until 2002. They did create a framework for effective teaching, and one of the points, point 6 of 6,

was ADA compliance. When I asked her what kinds of discussions she has with faculty about accessibility, she admitted, "to be honest, I haven't." I figured since she worked so closely with the distance learning program, she would know about how the accreditation visit went, so I asked her. I was quite surprised to learn that the accrediting agency "asked about accessibility as far as technology for typical people," but they did not ask about web accessibility for students with disabilities who use adaptive aids. However, later in our discussion, Brenda commended both offices that address the needs of students with disabilities and said "most of the time any of that adaptive technology type issue is handled in that" office. As we continued to talk, we covered topics of software compatibility, course design, new technology, and the appropriate use of technology for instruction.

The most pressing issue for her future, however, continues to be faculty and the attitudinal barrier that is present. She sees problems for the future with the time it will take to make courses compliant, learn new technology, and even take that first leap of faith into the online environment to begin with. She also wants to work on her own self-education. By her own admission, "[she] has never heard a text reader read a screen." She believes something as simple as exploring adaptive technology from the students' perspective will help her teach instructors how to design better courses. I could not agree more.

Regional University C is a rural regional university with the closest competing campuses at 50 to 60 miles away. Enrollment for the 2003-2004 academic year was 8,710. It was established early in the 20th century at the same time as the other normal schools in the state. In the late 1930s the university was given permission to expand its mission to include other degree programs in arts and sciences, and by the 1950s, the university began offering graduate degrees. Regional University C's mission is to create a learning environment that will produce the maximum opportunities for students to experience the life skills they need to succeed in a global society. The educational emphasis is still mostly on the teaching and human resources professions. Because of its location, it makes good use of tele-courses and interactive television courses, and within the last couple of years, instructors have begun to experiment more seriously with online course delivery.

In comparison with other institutions, however, the quality and quantity of their equipment lags behind according to Charles, their director of distance learning. I was surprised that for as much as this campus relies on these three modes of learning to reach out to other institutions across the state, this campus has no director of instructional technology. Instead, smaller areas that would be under that umbrella, such as distance learning, tele-learning, and interactive television departments, all fall under the category of learning services.

When I first visited Regional University C, it was clear that this is a rich environment for students with disabilities. Within 10 minutes of arriving on campus, an

ortho/mobility impaired student zoomed past me, seemingly comfortable in the halls of the administration building, as if he had been going that way for semesters. I found an empty classroom to wait in for my next interview, but students soon began to filter in, one after the other. I sat busily writing notes to myself, but my peripheral vision caught some rather animated movements. The students appeared deaf, and were signing to one another. It was nearly time for my interview, so I left the room, went upstairs, and waited outside the door of my appointment's office. While there, two more individuals in wheelchairs rolled past, one of whom was clearly a faculty member and another student. I knew I was in the right place for my study.

In fact, according to Catherine, director for student services for deaf and hard of hearing students, Regional University C was the first university in the state to start incorporating accessibility accommodations into its infrastructure in the late 1960s, before the Rehabilitation Act of 1973 required curb cuts. The college secured federal grants to modify existing structures, change sidewalks and install elevators, so students with disabilities could attend. According to Chip, director for student support services, this is precisely why students with all kinds of disabilities frequently choose Regional University C over other colleges. The office for students with disabilities at Regional University C currently serves over 100 students on their own campus. This office takes the responsibility for servicing all students who enroll in their tele-courses and interactive television courses because they generally have more expertise and resources in this area than the receiving sites. When I asked Chip and Catherine, both directors for different offices that service students with disabilities, about the number of their students who take Internet courses, I was surprised to learn that they both said one each. Since they also

both said the student was hard of hearing I also suspect that they were talking about the same student, but because of student privacy issues they could not confirm that suspicion. Both indicated that she was doing very well, but she was also the kind of student who would excel no matter what kind of course she took. Catherine also mentioned that many of her students, deaf and hard of hearing, use the Internet frequently, if not daily, both for personal and for academic reasons. Students are required to conduct research, and many instructors use WebCT on this campus as a way to easily disseminate course information to their students.

The training for course development at Regional University C for faculty currently comes from Chad, an instructional technology designer, who was hired by Charlotte, the Title III grant coordinator. When I asked them how many online courses the university current has, they could not give me a firm estimate. Their best guess is that they currently have 31 web-enhanced courses that use WebCT and 18 fully online courses. A quick survey of the spring 2004 schedule revealed an interesting pattern. Of the 15 online courses listed, only eight classes were 3000 level or less. The remainder was graduate level courses. Of the eight classes mentioned, only six of those courses were general education courses. Out of five courses offered in fall 2003, only one course was below graduate level and general education, so the options for many students in the online offerings are limited should they choose to participate.

This regional university, the smaller of the two in this study, required that I submit a summary of my proposal to their campus research review board. The request to conduct research was unanimously approved by the committee and approved by the vice president for academic affairs. Unlike the other institutions under study, this institution

214

did not allow me free access to the campus, personnel, and resources. The vice president for academic affairs insisted that I work through him alone to make contact with participants. I was asked to supply him with a list of individuals with whom I wanted to speak, and he contacted their supervisors. Some time later, he contacted me to let me know it was okay to contact those on my list. One candidate suggested I speak with an individual, and I asked for permission, but it was denied. However, the vice president did suggest another individual, and that candidate did consent to participate and was quite helpful.

Once the institution's chief academic office gave his approval to conduct research, I made contact with potential participants who fit in the category of individuals of instructional technology director, ADA personnel, or academic administrator by phone and by email. I approached five individuals on this campus for interviews. Two participants each asked people who work with them to sit in on the interviews. They are noted with corresponding asterisks, one asterisk noting the first pair and two asterisks noting the second pair. A total of seven participants were interviewed at this university. Another individual with the same job description as the one who declined agreed to participate, and an additional person from the ADA office agreed to participate for a total of eight interviews altogether.

Table 4 reports study participants and their positions for Regional University C. Pseudonyms were given to all study participants. They were randomly assigned, but in alphabetical order according to the order in which the interview occurred during the course of the study.

Table 4

Study Participants, Regional University C, Spring 2004

Participant	Position Held @ College
Catherine	Director of Student Services for Deaf and Hard of Hearing
Charles	Director of Distance Learning
Cindy	Director of Off-Campus Education
Chip *	Director for Student Support Services (ADA Coordinator)
Carrie*	Technology Assistant for Student Support Services
Chad **	Title III Grants Administrator
Charlotte **	Technology Specialist

Catherine is the director of student services for deaf and hard of hearing students at Regional University C. She also teaches 3/4 time for the human resources division. In her role as director for services for deaf and hard of hearing students, she coordinates services for the students, and she also conducts advising for students. One of her strategies, to maximize resources, is to group as many students in similar courses as possible. This practice maximizes the use of interpreters, which are expensive and difficult to schedule for few students in varied classes. Her concerns are many and mostly involve the garnering of resources. They need more recent equipment for captioning, which is very expensive, but they cannot afford it and currently do not have the people to do the work. Another of her concerns is fostering independence for her students. Her primary goal is to help her students become as independent as possible from her and the services her offices offer, so they can leave the university with the skills they need to make it on their own as much as possible. Personalities of other interpreters and the

students themselves make this goal difficult. She works closely with Chip and his office of student support services. Her office is actually part of his office, but she remarked that he allows her the freedom to handle her area how she sees fit. As far as work with campus personnel at large, Catherine did serve on an ADA committee about 10 years ago when the group wanted to address environmental and classroom concerns, such as noise and smells which can cause seizures. Since that time, the campus has become more technology oriented, and Catherine remarked that students have to work with the Internet, computer labs, and SMART rooms on campus. While she still believes that funding is an issue, she holds a relatively optimistic view of her students' ability to function well on that campus.

Charles is the director of distance learning, specifically interactive television, which is a specialty of this institution. Regional University C has seven distance education classrooms devoted to interactive television course delivery. Within the last few years, the institution began to change the delivery mode from strictly interactive television, where students sat in a classroom the entire time to a blended method where student had maybe 2/3 of their course in the classroom and the other 1/3 delivered via WebCT. Charles indicated that the students like the combination of class and WebCT delivery. Charles believes part of the students' success can be attributed to his willingness to help assuage their anxiety about being in a technology rich environment. He said this is true for students with and without disabilities.

In this environment, he did not see the technology as a barrier because he and his staff were always there to help students work out access issues. He said from what he hears, students' experiences in strictly online courses are not the same. They have

217

problems with software compatibility and more. He said they also have trouble with

hardware compatibility in that the technology on campus is much more sophisticated than

what many of them have at home. He also admitted that they have fairly frequent

connectivity problems, but they do what they can to work around those problems. Some

of his concerns include garnering additional resources for his area and finding a fair way

to compensate faculty for the time and effort it takes to create courses.

Cindy is the director of off campus education. Charles's area reports to her. She

coordinates the advisors on the various remote sites along with the advisor on the

Regional University C campus. When I visited with her, she had been with the university

approximately 7 months. Prior to that time, she had been an instructional designer,

working with faculty to develop online courses, at a major university in a neighboring

state. By the time Cindy left her former university, she had 20 instructional designers

working for her, along with five technical support staff, media developers, artists, and

web programmers. Her experience with online course development is extensive. When I

asked her about her experience with web design and students with disabilities her

response was, "that was a pretty big focus of ours for a couple of different reasons. Once,

because it was the law and two the whole concept behind web-based courses in general is

accessibility."

Cindy went on to describe her philosophy of web design which is "anything you

do for a student with a disability helps students without that disability." At the time of our

interview, she did not have the responsibility of the web courses, but she suspected that it

would not be long before that became part of her responsibility given her extensive

background in that field. When I asked where I could find the director of instructional

218

technology, she was the first to say there was no such office. Part of the problem, she said, was the "administration and web courses have not been clearly defined on our campus. It is not something that we have been doing for very long." The university is just now getting to the point where the number of course offerings is growing in popularity. Cindy did say that the closest thing to a director of instructional technology is Charlotte, who is the Title III director. On the organization chart, the Title III director is not in the chain of command reporting structure with either Charles or Cindy.

Because Cindy deals so much with students taking interactive television courses, and Charles had mentioned that he dealt with students with disabilities, I asked her about her relationship with Chip and Carrie, directors of the centers for students with disabilities. She said she did not even know Chip and only knew Catherine because she had known Catherine when she, Cindy, had attended the university as a student. She was a tutor for some of Catherine's students.

Some of Cindy's concerns include getting good design information to faculty and breaking the attitude barrier that makes people resistant to making changes for the purposes of accommodating students. She also wants to more actively seek alternative resources and learn what resources are available on campus to help create accessible courses. She is also concerned about getting more resources for her area to update equipment.

I interviewed Chip, the director for student support services at Regional University C, and Carrie, the assistant director and technology assistant for student support services, at the same time. Chip suggested interviewing the two of them at the same time might be easier and more fruitful. I agreed to interview them together because

I thought Carrie might be more comfortable with the arrangement. I had technical difficulties with my tape recorder, but did not discover a problem until I was on my way home from the interviews. None of the interview was recorded. I immediately set about writing down as much from my memory of the interview as I could. I sent a transcript of my notes back to Chip and Carrie and asked if they would both kindly check my notes for accuracy and completeness to the best of their memory, and they graciously did so.

Chip has been the director for student support services at the university for 23 years. Carrie has been assistant director and technology expert for six years. Because their campus serves such a wide range of students with disabilities, from paraplegics, traumatic brain injury, cerebral palsied, Tourette's syndrome, and a whole range of other disabilities, Chip is widely recognized among his peers as an expert on accommodations. He noted that peers from other higher education institutions in the state regularly call him for recommendations on all kinds of accommodations for students.

Carrie said the use a wide variety of technology to accommodate students' needs, but sometimes all they need to use are simple things, like puff paint to raise the lettering on a map, so a student who cannot see can feel it. She also indicated that even though they do not have to, they answer accommodation requests from other satellite campuses where the university delivers interactive television courses because many of those sites do not have the resources to assist students on their own. When asked about the web-based courses, both said they did not have much experience with them because the campus was not using many of them. Carrie did say, however, that they were having trouble with software instructors chose, particularly for a student with a disability in an online math course. Chip noted that problems occur when departments purchase

equipment and programs as well and do not consider how this population will be affected.

Carrie expressed a fairly strong wish to be able to deliver the message of accessibility to other people across the campus. She said that it is pretty clear that people think they are the only office on campus that takes responsibility for that issue. However, she wished more faculty would assume more responsibility, especially in the instructional side for their own accessibility options. Carrie felt confident that promoting the notion of universal design would be good for all students, but faculty might feel their options for course design were limited. On the contrary, she felt that all students, both students with and without disabilities, could perform better in a web-based course because the courses have the ability to engage the students on more than one level of learning.

Regional University C is required by the state regents to provide transportation for students with disabilities, and the university does this. It began in cooperation with a local public transportation system around 1980, but the university picked up responsibility for the service about 12 years ago. The transportation service runs students to medical appointments and rehabilitation appointments, and it takes them to a limited number of campus-sponsored events, such as homecoming. Chip and Carrie both described their students as needing a lot of one on one attention in the classroom, but while Carrie believed they would succeed in an online environment, Chip did not. In fact, he said he "[was] not going to encourage students to take web-based courses because they would unable to get one on one feedback and one on one help."

Chip and Carrie have different concerns. Chip's concerns include funding where Carrie focused more on the needs of the students. Carrie thinks many of the students with

disabilities have adaptive technology at home, mostly because of recent legislation that requires manufacturers to make the technology accessible, and therefore less expensive. However, she remains concerned about students with learning disabilities. She also feels people's understanding of students with disabilities and their needs must be heightened. She eluded to the fact that awareness or lack of understanding was sometimes and issue or barrier for students.

I interviewed Charlotte, the Title III grant coordinator, and Chad, an instructional technology designer who works for the Title III grant. The vice president for academic affairs suggested I interview Chad. Because the entry and usage terms for this university had been so different from my other experiences, I followed up on his suggestion. Charlotte invited Chad to join us, feeling that he might have something useful to add to the conversation.

Charlotte explained the purpose of the grant was to train faculty how to better use technology in the delivery of instruction both on campus and for distance education. They have three different divisions of distance education: enhanced courses, where WebCT is a supplement to the traditional classroom; blended courses, where there is reduced seat time with work required through WebCT; and, fully online courses. Charlotte's role is to coordinate the program where Chad's role actually in working directly with the delivery of faculty instruction.

Chad described in good detail the kinds of things he has helped instructors put in their WebCT shells. Many of them use PowerPoint, text, and streaming video, and they use chat, discussion, and other capabilities in WebCT for their courses. Charlotte explained that they have tried to raise the issue of accessibility with instructors, but she

222

feels that they might not be doing a very good job. She says, "As to how successful we have been, I'm afraid that I personally feel that the jury might give us a failing grade as far as consistency and meeting the criteria." She later said that they do not know if they had ever had an accessibility issue, but she explained her approach to the issue by making an analogy. "You know that a hurricane might someday hit if you're going to . . . live on a coast, but you really don't prepare for it until it becomes eminent." At that point, she says, the university would do what it had to do to make the accommodations. Her problem is that in the beginning stages of getting faculty on board with the technology, many of them are overwhelmed with learning the technology in the first place. She is afraid she will lose them if she tried to make them learn something like accessibility standards or principles of universal design during the course creation process as well. Chad agrees that faculty members' attitudes can be a problem, but in the end, he believes they will understand why accessibility considerations have to be made, and they will do what they have to do if they want to teach online. Chad believes this because the university not only has a high number of students with disabilities, but it also has a fair number of faculty and staff with disabilities as well.

Charlotte and Chad expressed several concerns. Charlotte expressed a desire to do a better job of educating faculty on accessibility issues. She also noted that she already had plans for the next Title III grant, which might focus on accessibility since the school seemed to be a perfect place. Charlotte expressed concern over faculty member's resistance to change.

Regional University D was also established as a normal school, but in the late 19th century. It is a suburban school close in a vital, growing city. The student population during academic year 2003-2004 was approximately 18,465 unduplicated headcount. Regional University D's mission is to provide superior educational opportunities at the levels of education appropriate to its tier for the purposes of preparing its students to achieve their goals. The university offers bachelor and masters degrees in arts and science fields with various emphases.

Regional University D focuses most of its distance education efforts on tele-learning and interactive television though it is beginning to devote a considerable amount of energy and resources to web-enhanced instruction. Debbie, assistant director of technology, could only give general statistics about WebCT usage on campus. She said of the 500 faculty who have been trained to use WebCT, "approximately 150 . . . are actually [use] it as more than just a place to [put] their syllabus." However, she could not tell me how many of those were strictly online courses and how many were web-enhanced courses.

All of the training for faculty comes from Debbie's area. In fact, when I arrived for our appointment, she was finishing up a tour of what was going to be their new state-of-the-art facility for teaching faculty how to infuse their courses, both campus-based and web-based, with more technology. Donna, the distance learning coordinator and the co-designer for web courses for faculty, confirmed that more technology is the direction for Regional University D's future. Unfortunately, according to Denise, the director for

services for students with disabilities, much remains to be done in order to accommodate her 587 students in an online environment.

Denise explained when she assumed her position at the university in 2002, "we had no assistive technology, nor do I think that they were looking towards purchasing any." She immediately became proactive in procuring whatever she could but admits it has been difficult because she was "met with extreme resistance in the beginning." However, she said once other areas on campus realized that her intentions were not malicious but rather they were to help students, her actions were better received. From my own observation, problems still exist among the offices involved in serving students with disabilities. While the campus institutional review board granted me free and open access to campus, with offers of help, it was difficult to secure interview with all personnel except Denise, the director for student with disabilities. The vice president of information technology never returned my calls.

When I asked Denise how many students with disabilities were enrolled in online courses, she counted 10. She also felt they were succeeding. Most of the students use computers on campus or in the offices for students with disabilities because they can get assistance with the adaptive technology if they need it. She did not voice an opinion regarding whether she thought most of Regional University D's students had the technology at home as Chip and Carrie thought Regional University C's students' do.

This university, the largest in the sample, required that I go through their Institutional Review Board process before granting access for research by submitting a copy of my proposal for review. After I received approval from the IRB committee, I made contact with potential participants. I approached four individuals on this campus for

interviews, but one individual, the vice president of information technology, never

acknowledged my overtures for an interview. Of all the sites, I experienced more

resistance in securing interviews with desired personnel, so much so, that I contacted the

one person's supervisor, whom I had already interviewed, for gentle assistance.

Table 5 reports study participants and their positions for Regional University D.

Pseudonyms were given to all study participants. They were assigned in alphabetical

order according to the order in which the interview occurred during the course of the

study.

Table 5

Study Participants, Regional University D, Spring 2004	
Participant	Position Held @ College
Debbie	Assistant Director, Academic Technologies and Training
Denise	Disabilities Support Services Coordinator
Donna	Distance Learning Coordinator and Co-designer for faculty courses

Debbie is the assistant director of technology at Regional University D. One of

her primary responsibilities is to work with the universities center for faculty

development, which offers faculty a place to learn new technologies and try projects on

their own. They train faculty to use WebCT and help them develop their courses. One

specific service they perform is editing video clips and loading them in their WebCT

courses. Debbie admitted one of the reasons they chose WebCT is because of its ADA

compliance. When I asked her what else she knew about ADA compliance, she talked

mostly about creating reusable learning objects, which chunks information into electronic

bits that can be replayed over and over. Other than that, "really the only thing that I do is

226

refer faculty to her [Denise] if they have . . . any questions about that." She said her goal

is to ensure that students have access to all resources on campus, but when I asked if

there was a review process in place for online courses, she said no, particularly for the

non-academic sites. "Some faculty even balk at peer review." However, she did say that

the vice president for academic affairs was working hard to change that. She

acknowledged that some oversight occurs at the department level, but it is all faculty

driven. Her office does not have an opportunity to check for accessibility compliance.

Her concerns include the degree of faculty autonomy and how that sometimes

translates into poor course design. She believes her department's role is "to show faculty

what the best practices are for making any kind of technology available for all students…

giving them good examples of what they can do... and then helping them do that."

Funding and the lack of personnel are additional concerns with this mission in mind.

Denise is the director of services to students with disabilities. She has only been

with the university for two years, and her presence has made a significant difference for

the population. When she came, there was no assistive technology for students' use. Since

that time, they purchased assistive technology for all labs, purchased computers for her

area, and purchased innumerable types of equipment and software for students' use. She

is always working toward procuring more adaptive technology for her students, which the

students frequently use in the center. They can also obtain training or assistance on any of

the technology the school owns. She also established policies and procedures for things

such as captioning video for instructors' use. Times for Denise have not always appeared

so bountiful. She attributes the resistance to attitudinal barriers. She said there was some

misunderstanding about the law and who was responsible for what, but once they got

passed all that, the equipment came in, and students were served. It was not easy though. She explains: "When I came in, they told me the best thing about this job was this green chair, and I laughed and thought, 'sure,' and then realized a month later that they really [weren't] joking!" She explains that it is a difficult job in two respects. First, it is challenging to try to meet the requirements of the law. Second, "professors are set in their ways." She said they have a hard time understanding why they have to give thing to one student but not all of them, so she uses the following analogy. "You have a field of birds, and one of them is a bald eagle, well guess what? That one's protected federally, and so is this student. The rest of those ducks [aren't]."

Denise's concerns are clear. There is a historical distrust of the office she holds, and she fights an uphill battle with faculty regarding their understanding of their responsibility for accessibility in the classroom. When I asked about online accessibility her reaction was equally concerned. "Are we to the level of what 508 reads? No we are not. I am sure we will to a degree. No one likes change completely and that would be a complete change in the purchasing" and thought processes of people on campus. At this time, she is not aware of anywhere on campus where information can be obtained on web accessibility. In her estimation, and from her experience, it has not been a high priority for the information technology department. However, a quick survey of the college's web site revealed the publication of the school's guidelines for use of the World Wide Web. Included in that document is a paragraph that states the university's voluntary commitment to Section 508 standards for the Office of Information Technology for all campus web pages. It does not, however, say anything about faculty pages or online course pages, and it does not provide a link for more information. Finally, Denise would

like to have a more open relationship with other offices on campus but believes it will take time.

Donna is the distance learning coordinator and the co-designed for web courses for faculty. She is primarily responsible for determining what classes the university sends and receives via interactive television. She also trouble-shoots the broadcasting equipment for technical problems and works with receiving sites, which frequently have substandard equipment in comparison, to make sure the equipment works for course transmission. Regional University D currently has close to 500 students per semester taking classes via interactive television from and to an average of 50-60 sites. Another part of her job is to help faculty members who teach via interactive television and online build their WebCT courses. She provides backup support for Debbie, the assistant director of technology. She occasionally helps with training as well. Her concerns include the age and condition of the interactive television rooms. When I asked her what experience or knowledge she had of student accessibility in the online environment, she replied, "The first time that it even crossed my mind was when I got the email from you . . . I have never discussed that with anybody . . . I don't know if that is good or bad?"

Appendix G

Institutional Review Board Approval

Oklahoma State University
Institutional Review Board

Protocol Expires: 8/10/2004

Date   Monday, August 11, 2003   IRB Application No   ED03144

Proposal Title   WEB ACCESSIBILITY FOR STUDENTS WITH DISABILITIES WHO USE ASSISTIVE
TECHNOLOGY A MOVING TARGET FOR POSTSECONDARY INSTITUTIONS

Principal
Investigator(s)

Teri Ferguson   Adrienne Hyle
833 Birch Drive   106 Willard Hall
Norman OK 73072   Stillwater. OK 74078

Reviewed and
Processed as: Exempt

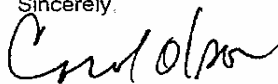Approval Status Recommended by Reviewer(s) Approved

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Dear PI

Your IRB application referenced above has been approved for one calendar year   Please make note of
the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of
individuals who may be asked to participate in this study will be respected, and that the research will be
conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46

As Principal Investigator, it is your responsibility to do the following:

1 Conduct this study exactly as it has been approved   Any modifications to the research protocol
   must be submitted with the appropriate signatures for IRB approval.
2 Submit a request for continuation if the study extends beyond the approval period of one calendar
   year   This continuation must receive IRB review and approval before the research can continue
3 Report any adverse events to the IRB Chair promptly. Adverse events are those which are
   unanticipated and impact the subjects during the course of this research; and
4 Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB   If you have questions about the
IRB procedures or need any assistance from the Board, please contact Sharon Bacher. the Executive
Secretary to the IRB. in 415 Whitehurst (phone: 405-744-5700, sbacher@okstate edu)

Sincerely.

Carol Olson. Chair
Institutional Review Board

VITA

Teri Lyn Ferguson

Candidate for the Degree of

Doctor of Education

Thesis: WEB ACCESSIBILITY FOR STUDENTS WITH DISABILITIES WHO USE ASSISTIVE TECHNOLOGY: A MOVING TARGET FOR POSTSECONDARY INSTITUTIONS

Major Field: Higher Education

Biographical:

Personal Data: Born in Long Beach, California, on June 21, 1966, the daughter of Wayne and Julia Ferguson

Education: Graduated from Sallisaw High School, Sallisaw, Oklahoma in May 1984; received Bachelor of Arts degree in English from University of Oklahoma, Norman, Oklahoma in December 1988; received a Master of Arts degree in English from University of Oklahoma, Norman, Oklahoma in May 1994. Completed the requirements for the Doctorate of Education degree with a major in Higher Education at Oklahoma State University in July 2005.

Experience: Graduate teaching assistant, University of Oklahoma (1989-1990); adjunct English instructor, Brookhaven Community College, Farmers Branch, Texas (1991-1992); adjunct OSU-Oklahoma City (1993-1999); adjunct, Oklahoma City Community College, (1995-1998); visiting lecturer, University of Oklahoma, (1997-1999); full-time faculty member OSU-Oklahoma City 1999-present. Humanities Department Head since 2001.

Professional Memberships: Phi Kappa Phi, Modern Language Association, National Council Teachers of English

Name: Teri Lyn Ferguson   Date of Degree: July, 2005

Institution: Oklahoma State University   Location: Stillwater, Oklahoma

Title of Study: WEB ACCESSIBILITY FOR STUDENTS WITH DISABILITIES
                     WHO USE ASSISTIVE TECHNOLOGY: A MOVING TARGET
                     FOR POSTSECONDARY INSTITUTIONS

Pages in Study: 230   Candidate for the Degree of Doctorate of Education

Major Field: Higher Education

Scope and Method of Study: The purpose of this study was to determine what colleges
    and universities are doing to help students with disabilities who use assistive
    technology access asynchronous web-based courses. Participants interviewed
    included 19 instructional technology, distance learning, ADA coordinators, and chief
    academic officers from four institutions in a state in the Midwest. Two institutions
    were regional universities, and two were two-year colleges.

Findings and Conclusions: The evidence in this study revealed barriers to the
    implementation of current legislation that says that ADA law applies to the Internet.
    One barrier is the institution in the form of strong hierarchies, lack of resources, and
    reticent administrators when facing strong faculty groups. Personnel also acted as
    barriers through their behavior and role conflict. Conclusions drawn from study
    evidence include few institutions rely on a plan for implementing accessibility
    measures. Most respondents admitted to addressing online accessibility on a case-by-
    case basis. Next, most of the respondents in the study were unclear about the legal
    requirements and what constituted assistive technology. Also, no institution made
    accessibility training a priority when training faculty to build courses. There also
    appears to be a lapse in online training for accessibility. Even though national studies
    suggest the presence of a notable population of students with disabilities in distance
    education, this study revealed that very few students were actually enrolled in online
    courses. Something or someone at those institutions prevents or discouraged their
    enrollment. The study suggests that current Office of Civil Rights rulings and existing
    federal law are not enough to deter poor practices.

ADVISER'S APPROVAL: Dr. Adrienne Hyle